




An Investigation into Institutional Repository Policies and Practices in University Libraries in Africa

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Article Info

ABSTRACT

Article type:

Research Article

Article history:

Received September 15, 2024

Received in revised form November 22, 2024

Accepted December 24, 2024

Published online December 28, 2024

Keywords:

institutional repository, institutional repository contents, university libraries, IR policies, Africa

Objective: The purpose of this study was to investigate the various institutional repository policies that guide the development of institutional repositories in university libraries in Africa.

Methods: Data was collected from 150 universities in English speaking countries in Africa through OpenDOAR database search, searching each of the IRs to identify the type of content submitted and the IR policy statements available, and IR administrators/institutional repository librarians were interviewed to elicit data related to the challenges encountered in implementing IRs in Africa.

Results: The study revealed that staff journal articles, theses and dissertations, and conference proceedings and workshop papers were seen as the most common contents used to develop institutional repositories. The findings show that out of the 150 IRs surveyed, only 14 institutional repositories have one form of IR policy or the other. Lack of funds, absence of IR policies, inadequate facilities, challenge of collecting contents from various contributors, unstable Internet connectivity, and lack of ICT skills were the most mentioned as challenges encountered in implementing IRs in Africa.

Conclusion: The results from the study will provide important data and insight into the development of institutional repositories policies in university libraries in Africa, and generate suggestions for University Librarians, University management and policy makers for developing institutional repositories in Africa.

Cite this article: Obaro, G. O., & Arumuru, L. (2024). An investigation into institutional repository policies and practices in University Libraries in Africa. *Informology*, 3(2), 73-100.



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Publisher: Informology Center.

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Introduction

A recent emerging trend in academic libraries is the implementation of institutional repositories (IRs). Universities as institutions of higher learning place emphasis on research as one of their core functions apart from teaching and community services. An institutional repository could thus be viewed as a digital archive that provides the platform where the universities can archive their intellectual output. The IRs could contain theses, dissertations, projects, course notes, seminar papers, conference proceedings, administrative documents, learning objects and other forms of grey literature. One key criterion that is used to measure the quality of a university is the quality and quantity of research output (Anenene et al., 2017). The situation where the totality of the research output emanating from a particular university cannot be ascertained will make it very difficult to evaluate the university output and could also impede the collation and onward transmission of the research that can benefit different segments of the society to the parties concerned. This reveals the need for the establishment of institutional repositories policies such as submission policy, digital preservation policy, and copyright policy formulated to guide the development of IRs. Omeluzor (2014) stated that both institutions and contributors benefit from IR. Institutions benefit from IR as it; serves as tangible indicator of an institution's quality, thus increasing its visibility, prestige, and public value; increases the ranking of an institution both at local and international level; enhances learning, online teaching and research especially in universities; and presents an institution's intellectual capital to a whole lot of scholars.

Just few years ago, universities in Africa started developing institutional repositories to showcase their institutional resources, thereby increasing their visibility and better performance in the ongoing web ranking of world universities in particular. For example, In the Centre for World University Ranking (CWUR), 2021-2022 rankings of the top 2000 universities, it is sad to note that only 15 universities from Africa made the list of the top 1000. Among the 15 Africa universities that made the list, seven are from South Africa (University of Cape Town – 269th position; University of Witwatersrand – 292nd position; Stellenbosch University – 435th position; University of KwaZulu-Natal – 483rd position; University of Pretoria – 580th position; University of Johannesburg – 676th position; and North-West University – 924th position), five universities are from Egypt (Cairo University – 546th position; Ain Shams University – 797th position; Mansoura University – 984th position; and Alexandria University – 999th position), one each from Morocco (Mahammad V. University – 946th position), Uganda (Makerere University – 934th position), and Tunisia (Tunis EI Manar University – 952nd position) (CWUR, 2022). CWUR's rankings grade universities on seven factors. They are: quality of teaching, alumni employment, quality of faculty, research output, quality publications, influence, and citations. The methodology has been enhanced this year, with research now accounting for 70 per cent of

the score (CWUR, 2022). This ranking together with the other factors is based on a visible institutional repository.

In many African countries, the development of institutional repositories has faced serious problems ranging from low Internet connectivity; software and hardware challenges; lack of highly skilled personnel; inadequate power supply; low bandwidth; legal copyright laws; poor funding; lack of IR policies; project sustainability and many others (Ezeani & Ezema, 2011). Adetoro Salau et al. (2020) investigated the performance of *electronic theses and dissertations* (ETD) initiatives in the repositories of federal government-owned universities in Nigeria. The authors found that the ETD initiatives in repositories have not made remarkable progress as digital libraries based on policy, content and system architecture. The repositories housing the ETDs are also not compliant with the open archive initiative-protocol for metadata harvesting framework. For research outputs emanating from African universities to be visible, it has become imperative for university libraries in Africa to embark on formulation of policies regarding the development of institutional repositories to serve as a platform for the visibility of research outputs in these universities. Therefore, the present study aims to investigate the various policy statements regarding institutional repository development in African universities.

For research outputs emanating from African universities to be visible, it has become imperative for university libraries in Africa to embark on formulation of policies regarding the development of institutional repositories to serve as a platform for the visibility of research outputs from the universities. It also appears that the daily research outputs from universities such as research papers, theses and dissertations, projects, and other valuable library information resources are not widely communicated to users and researchers all over the world. Therefore, a well-articulated institutional repository policy to develop IRs is the answer to research outputs visibility and accessibility. The existing literature shows that little is been said on institutional repositories policy development in African universities. The current study aims to fill the gap by investigating institutional repository policies and practices in university libraries in English-Speaking countries in Africa. To achieve this, the following research questions were raised to guide the study.

Research Questions

- RQ1. What contents are used to develop the institutional repositories?
- RQ2. What Access policy is put in place in the IRs?
- RQ3. What content policy is put in place on the type of content to be included to the IR?
- RQ4. What submission policy on how content need to be submitted to the IR?
- RQ5. What digital preservation policy is put in place to guide long-term or short-term preservation of content in the IR?
- RQ6. What copyright policy are put in place to guide against copyright violation?
- RQ7. What are the challenges encountered in implementing IRs in Africa?

Literature Review

Contents used to develop IRs in Africa

The development of institutional repositories in libraries has come as a blessing to universities in Africa. It is envisaged that it will solve problems of low visibility of African content on the World Wide Web (Internet), greater speed of dissemination of knowledge from Africa, increased citation for authors whose works are published in the repository and improved ranking for the universities amongst others (Chisita & Chiparausha, 2020; Okonkwo & Obaro, 2020; Obaro & Okonkwo 2023). The types of content range from published articles to theses and dissertations, book chapters, data sets, conference papers, learning objects, and grey literature and ephemera. Wirba Singeh et al. (2013) report that for repositories to be successful and sustainable, they should contain scholarly works of enduring value.

Chisita and Chiparausha's (2020) study confirm that academic libraries in Zimbabwe were able to use institutional repositories to effectively generate new e-contents and explore opportunities to license their contents. They add that the contents of the Zimbabwean institutional repositories included local e-content such as peer-reviewed articles, conference proceedings, theses and dissertations, technical reports and grey literature. Similarly, the recent study by Arlitsch et al. (2021) reveals that different types of content, such as electronic theses and dissertations, may affect use of institutional repositories. They found that the Epsilon Archive for Student Projects, Massey Research Online, University of Western Cape repository electronic theses and dissertations repository, UWSpace and CaltechTHESIS are among the repositories whose content consists almost entirely of electronic theses and dissertations. Bangani (2018) found that institutional repositories in public universities in South Africa mostly contain electronic theses and dissertations, while journal articles and conference proceedings are increasing in number. Other common contents are memorial lectures, discussion papers, library newsletters, university calendars and graduation ceremonies, university management collections, media coverage, events, research data, policy briefs, university communiques and audio collections (Bangani, 2018). Baro and Otiode (2014) have reported the poor visibility of Nigerian scholarship thereby giving low impact to published works and other valuable information resources coming out from the country. In addition to this, these studies revealed that the quality papers from the country lack readership outside the country. According to Grundy (2017), one of the prominent indicators for university ranking is research productivity. That is, it looks at a university's reputation for research excellence among its peers. Another important criterion is the research influence (citations). The research influence indicator looks at university's role in spreading new knowledge and ideas, i.e. the number of times a university's published work is cited by scholars globally. For example, Hossain Shoeb (2010) reported that the Cybermetrics Lab listed Independence University, Bangladesh in their ranking of top 100 universities (in

Bangladesh, first among all private universities, third among all universities after Bangladesh University of Engineering and Technology (BUET) and Dhaka University (DU) and 75th position on the Indian-subcontinent in their January 2009 ranking. This ranking according to Hossain Shoeb (2010), was based on research activities, visibility of the university nationally and internationally, volume of scholarly document created and published, and size and impact of its web presence. The fruits of research from the formal research programs of conventional universities and academic research institutions in Nigerian universities are under-utilized as the access to the theses and dissertations is very limited to users outside the university (Ezeani & Ezema, 2011; Baro & Otiode, 2014).

Policy statements concerning IRs

Sutton (2019) sees policy making as a problem-solving process which is rational, balanced and analytical, pointing out that within a policy framework decision are made in a series of sequential phases, starting with the identification of a problem or issue and ending with a set of activities to solve or deal with it. Research on IR in African institutions has shown lack of policy as one of the detrimental factors (Ubogu & Pickover, 2011). With IR content growing rapidly, it is important to look at how policies have been developed to guide the issues like content submission, type of materials to be added to the institutional repository, digital preservation, and copyright issues. The study by Ukwoma and Ngulube (2019) identified the existence of an IR policy to serve as a guide to collection and submission of publications, continuity and sustainability of the IR project as one of the strategies employed to avoid must challenges faced in implementing institutional repositories. According to Ambruster (2011), IR depends so much on availability of policies to manage them.

Submission policy

In so many IRs, there are collection policies put in place to guide what content is to be submitted to the IR. As to how content is deposited in the IR, the survey by Li and Banach (2011) asked about three methods: author self-archiving, by third party on behalf of the author, and by repository staff. The study by Li and Banach (2011) revealed that content is deposited in the IR by using all three methods in 92 percent of the surveyed institutions.

Type of content to be added to the IR

A wide variety of content may be included in the institutional repositories for the multiplicity of purposes and users depending on the policy. Though some repositories may contain materials that are not scholarly in nature depending on the policy, the main trust of IR is to preserve and make accessible the scholarly publications of an institution. Wirba Singeh et al. (2013) reported

that for repositories to be successful and sustainable, they must be populated with scholarly works of enduring value.

Digital preservation policy

Developing preservation policies ought to be the first step toward guaranteeing preservation actions. The strategies for preserving IR content and the decisions about what content requires short, medium, or long-term preservation should be driven by preservation policies. To be able to manage collections effectively and to design and select the appropriate long-term digital preservation solution, there must be an appropriate policy framework in place; this framework should include policies concerned with the preservation of the objects within the collection (Bunakov et al., 2014).

Copyright issues

The principle of fair use recognizes the lawful use of copyrighted work without deeming it an infringement, notwithstanding that the copyright holder has not authorized the use (Chuma-Okoro, 2010). Repositories require that legal issues bordering on copyright be cleared. Acquiring the rights from content contributors and copyright holders to distribute the content freely is an integral part of collecting content. Aminu, Osaheni and Yusuf (2022) compared the availability of institutional repository policies in three African countries such as South Africa, Kenya, and Nigeria. The study found that only few institutional repositories among the 75 IRs in these three countries have IR policy statements. The study also revealed that South Africa has the highest country with IR policy statements, compared to Kenya and Nigeria.

Challenges encountered in implementing IRs in Africa

The major challenge here is that African Universities have already started showing signs of administrative incapacity as it relates to the management of institutional repositories. An IR must have a mission that is the focus of the collection. This mission will drive the development of the policy which ought to be the first step towards guaranteeing the success of the IR. Adetoro Salau et al. (2020) investigated the performance of electronic theses and dissertations (ETD) initiatives in the repositories of federal government-owned universities due to the poor global visibility of ETDs from Nigeria. The authors found that the ETD initiatives in repositories of Nigerian federal universities have not made remarkable progress due to lack of IR policy, content and system architecture. Ukwoma and Ngulube (2019) found that having IR policy is one of the means of implementing IRs. A well-articulated institutional repository policy should be the content of the advocacy strategy. The policy statement should include: aims and benefits of institutional repositories to the institute, cost of software and hardware; cost and method of digitization; staff training; robust internet bandwidth; contents of the repositories and means of generating contents;

copyrights and intellectual property rights management among others. Jelagat et al. (2021) reported that IRs as currently modelled in Kenya are not efficient in supporting teaching, learning and research in universities because of challenges in content recruitment, and lack of IR policy.

The respondents in Anyaoku et al.'s (2019) study took the time to write comments on the problems encountered in the development and maintenance of institutional repositories. They mentioned issues such as: the need for dedicated staff to manage the institutional repository; none of the repository staff being professionals but training on the job; not having enough resources (e.g., sufficient random-access memory to cater for the access load and to run back-ups, and a shortage of staff to maintain and manage the institutional repository, with one person being responsible for everything); a lack of expertise in the use of DSpace; the lack of an annual budget for the institutional repository, limiting how much could be done each year; the cost of Internet services; incessant power cuts; staff feeling reluctant to submit their publications to the institutional repository; legal issues; a lack of expertise on the part of librarians in troubleshooting technical problems; and a lack of awareness among academic staff of the existence of the institutional repository.

Materials and Methods

The study covered all university libraries in English-Speaking countries that have developed institutional repositories in Africa. Data collection was in three phases. First, OpenDOAR database (www.opendoar.org) search was used to identify university libraries that have developed IRs in English-Speaking countries in Africa. In the process, 150 IRs that have developed in university libraries in English-Speaking countries in Africa and are registered in OpenDOAR were identified and used for the study. Second, the IRs were searched to identify the type of content submitted and the IR policy statements in each of the university libraries. Third, IR administrators/ institutional repository librarians were contacted to request for interview schedule to elicit data related to the challenges encountered in implementing IRs in Africa. The interview was done through e-mail conversation with the IR administrators/institutional repository librarians separately. The interview question was: Since you are the person in-charge of the IR in your library, can you mention some of the challenges your library encountered in implementing IR in your university?

Data collection for the study started April 2024 and ended July, 2024. The data on availability of policies related to IRs was done using check-list. Some of the IR policies seen in the various IR sites were presented in the discussion section. Other results are presented in Tables.

Results and Discussion

Contents used to develop institutional repositories in university libraries in Africa

Out of the 150 institutional repositories surveyed in this study, staff journal articles, and theses and dissertations are the most popular contents used by the majority (141: 94%) of the responding institutions to develop their institutional repository. Followed by conference proceedings and workshop papers used by 132 (88%) institutional repositories. While, books, chapters and learning objects are used by 102 (68%). Only few (58: 38.7%) IRs used past question papers, art works, and old newspapers to develop their institutional repository. The results revealed that staff journal articles, and theses and dissertations are the most popular contents IRs in universities in Africa used to develop their IR. The results on the type of content used to develop the IRs revealed that staff journal articles, and theses and dissertations are the most popular contents IRs in universities in Africa used to develop their IR. This finding confirms the findings of previous studies like Baro and Nwabueze-Echedom, (2023), Bangani (2018), Shajitha and Abdul Majeed (2018). For example, Bangani (2018) found that institutional repositories in public universities in South Africa mostly contain electronic theses and dissertations, while journal articles and conference proceedings are increasing in number. In the same vein, the study by Baro and Nwabueze-Echedom, (2023) found that out of the 134 responding institutions in Africa, theses and dissertations (130 (97.0%)), followed by 94 (70.1%) journal articles, and 71 (53.0%) conference and workshop papers are the most popular contents used to develop IRs. Singeh et al. (2013) report that for repositories to be successful and sustainable, they should contain scholarly works of enduring value.

Availability of IR policy statements in University Libraries in Africa

Results in Table 1 revealed that out of the 150 IRs surveyed, only 14 (9.3%) institutional repositories have one form of IR policy or the other. This shows that IRs in university libraries in Africa have not taken the development of IR policies as priority. This finding agrees with findings of recent study by Posigha and Idjai (2022) who investigated the availability of various institutional repository policies that guide the development of institutional repositories in university libraries in Nigeria. The study adopted IRs investigation and interview methods to collect data on IR policies, challenges from the 19 IRs in Nigeria. The study found that only few IRs in university libraries in Nigeria have clearly defined IR statements. The study therefore called for universities intending to establish IR to consider making policy statements related to IRs such as access policy, content policy, submission policy, preservation policy to guide the successful development and management of IRs.

Access Policy in the IR

On access to content policy, only 11 (7.3%) IRs have policy on access to content in the IRs in Africa. For example, at the Covenant University, Ota, Nigeria, the access policy states that anyone may access full items free of charge. Copies of full items generally can be reproduced, displayed or performed, and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge.

In South Africa, Cape Peninsula University of Technology, has access policy that reads

In recognition of the global movements Open Science, Open Data and Open Access focused on promoting unlimited access to research outputs in all domains and digital formats in pursuit of the advancement of science, knowledge creation and dissemination and preservation, this policy intends to make published research generated by Cape Peninsula University of Technology more accessible and visible through institutional repositories hosted by the library.

At the University of Pretoria, South Africa, the access policy states that

The University of Pretoria supports free access to research literature for all researchers worldwide and takes responsibility for the dissemination of its own research outputs.

At the University of the Free States, South Africa, the access policy states that

Kovsie Scholar is the University of the Free State's open access repository for published research articles and completed theses and dissertations by UFS researchers and students.

At the Kenyatta university, Kenya, the open access policy states that

Kenyatta University shall disseminate the output of its research and scholarship globally through its institutional repository under the Creative Commons license.

Type of Content Policy in the IR

Out of the 14 IRs with policies, only nine (6%) institutional repositories have content policy to determine type of content to be collected in the repository. This shows that majority of the IRs do not have defined content policy. This finding agrees with findings of period studies in other regions. For example, the study by Gul, Bashir and Ganaie, (2020) reported that the content management policies for the majority of the repositories is poor as all the policies score low in IRs of the South Asian region. Elahi and Mezbah-ul-Islam (2018) have also witnessed a weaker status of open access repositories in Bangladesh in terms of content management policies. Some examples of type of content policy in IRs in Africa are:

At Ahmadu Bello University, Zaria IR content policy states that

The Ahmadu Bello University, Zaria Institutional Digital Repository shall hold Theses/Dissertation etc. of postgraduate students of ABU, Zaria university community members' publications including refereed research article at the pre-print and post-print stage of publications, Grey literature, including special collections, Conference Proceedings and seminar papers.

At the Covenant University, Ota, Nigeria, the IR content policy states that

The University holds all types of materials. Deposited items may include: working drafts; submitted versions (as sent to journals for peer-review) accepted versions (author's final peer-reviewed drafts); published versions (publisher-created files).

At the ST. Paul University, Kenya, the content policy states that

Faculty, students and staff's scholarly and creative collection are: published peer-review literature; creative works; unpublished scholarly and creatives works; classroom resources; journal articles; conference proceedings, symposia, public lectures; and patents.

At the University of Embu, Kenya the content policy states that

The following types of materials shall be accepted into the Repository: theses and dissertations/research projects; scholarly research articles (published peer reviewed and pre-prints); open lectures; conference/workshop proceedings; books, monographs, chapters; image collections (paintings, pictures, drawings, illustrations, etc.); audio and audio-visual materials; technical reports and working papers; inaugural lectures, distinguished lectures, speeches; admissions lists; graduation lists; University policies; events programmes; valedictory presentations; University calendars; University magazines; forms; newsletters; and literary publications.

In South Africa, At the Cape Peninsula University of Technology, South Africa, the content policy states that

the IR holds all research outputs produced by employees and students of the University. The policy does not cover University administrative records.

At the University of Cape Town, South Africa, the IR content policy states that

The institutional repository (Open UCT) collects digital copies of scholarly articles, essays, books, peer reviewed conference papers, reports (where permitted by a funder of the research leading to the report), educational resources, scholarly multi-media material, audio-visual works and digital representations of pictorial and graphical materials.

The study by Gul et al. (2020) reported that the content management policies for the majority of the repositories is poor as all the policies score low in IRs of the South Asian region. Similarly, Abrizah et al. (2010) have studied the content management policies of OARs in Asian universities and found that a huge score of the repositories have an “undefined” policy for content submission and preservation with a meager score of repositories having a defined “recorded content policy,” “recorded submission policy” and “recorded preservation policy.” “Recorded metadata re-use policy” and “recorded full-text data re-use policy” is also reflected in a low score of repositories. For this reason, the IR administrators need to look into the issue of having a defined content management policy seriously so that content creation and management will have a well-defined outlook.

Submission Policy in the IR

Results in Table 1 shows that with regard to submission policy, only 11 (7.3%) IRs have submission policy statement to guide submission of contents to the Institutional repository. Some examples of IR policies in university libraries in Africa are:

In Kenya, the Masinde Muliro University of Science and Technology (MMUST) IR submission policy states:

Items may only be deposited by accredited members, academic staff, registered students, and employees of the institution, or their delegated agents. Authors may only submit their own work for archiving. Each Faculty member shall provide an electronic copy of the final version of his/her scholarly work at no charge to the library in an appropriate format (Such as PDF) not later than the date of its publication.

At the Kenyatta University, Kenya, part of the submission policy reads

All depositors shall agree to a Kenyatta University, Kenya Deposit Agreement contained in the IR Policy.

In Nigeria, the Covenant University IR submission policy states that

Items may only be deposited by accredited members of the institution, or their delegated agents. Authors may only submit their own work for archiving. Eligible depositors must deposit full texts of all their publications, although they may delay making them publicly visible to comply with publishers' embargos. The validity and authenticity of the content of submissions is the sole responsibility of the depositor. Items can be deposited at any time, but will not be made publicly visible until any publishers' or funders' embargo period has expired.

At the Ahmadu Bello University, Zaria, Nigeria, the submission policy reads

University document may be deposited by only accredited members of Ahmadu Bello University, Zaria or their delegated agents. Authors may submit their own work for archiving.

In South Africa, the University of Cape Town (UCT) IR submission policy states that

A student shall through self-submission upload the final corrected version of the thesis or dissertation into the University's PeopleSoft system prior to graduation, for final migration into the officially designated Institutional Repository (Open UCT). It is mandatory that authors deposit an appropriate version of Scholarly Publications into Open UCT. Authors who are obliged by grant funding conditions MUST ensure that the appropriate version of the scholarly publication is deposited into Open UCT. Where an author voluntarily deposits a Scholarly Publication to which open access is restricted by virtue of a publisher agreement, the author will be deemed when doing so to grant UCT a royalty-free, non-exclusive, non-commercial, worldwide licensee to publish this in a UCT Institutional Repository.

At University of the Free State, South Africa, the submission policy reads

The University of the Free State policy on Masters and Doctoral Studies requires that the required number of copies of the thesis or dissertation be submitted to the Student Academic Services Department. In addition, each student must submit an electronic copy of the thesis or dissertation to the library and the faculty.

At the Cape Peninsula University of Technology (CPUT), South Africa institutional repository, the submission policy states that

Uploading can only be done by a library employee of CPUT who is an Institutional Repository specialist and has knowledge of metadata. Only in the case of research data sets is the author permitted to make their own submission, which will go through a review process to certify the quality of the metadata before it is made public.

At University of Pretoria, South Africa, the IR submission policy reads

each student should submit paper and electronic copies of his/her thesis/dissertation to the Postgraduate Office of the relevant faculty.

The present study therefore revealed that only few IRs in university libraries in Africa have well defined submission policy statement to guide submission of contents to the Institutional repository. This finding agrees with the findings of Gul et al., (2020) that submission policy holds weak in IRs of the South Asian region as only 14 (20 percent) repositories have well defined

submission policy while as a huge score (56; 80 percent) of the repositories have not defined their submission policies. Ahmed et al. (2014) have also identified that the majority of the repositories have an undefined policy for content submission and preservation. A small percentage of ETD repositories had defined recorded content policies, recorded submission policies, and recorded preservation policies.

Digital Preservation Policy in the IR

Out of the 14 IRs with IR policies, only 9 (6%) IRs have policy statements on preservation of contents in the IRs. Example of some preservation policy statements in university libraries in Africa seen on the IR are given bellow:

In South Africa, Cape Peninsula University of Technology (CPUT) IR preservation policy states that

As a signatory to the Berlin Declaration on Open Access to the Sciences and Humanities, CPUT affirms its role in the global community by contributing to the creation and preservation of knowledge and its wide distribution on open platforms without any restrictions on discoverability and visibility.

At the University of Pretoria, South Africa, the IR preservation policy reads

Mechanisms exist for the long-term preservation of UP theses and dissertations.

At the University of Cape Town, South Africa, the IR preservation policy states that

The University of Cape Town will preserve the work of UCT Authors and maintain open dissemination, maximize visibility and discoverability through long term, robust and scalable digital platforms and services of the highest standards.

In Kenya, The Masinde Muliro University of Science and Technology (MMUST) IR preservation policy states that

Items will be retained within MMUST digital repository indefinitely; MMUST will endeavor to provide continued readability and accessibility of all items deposited in the repository.

At the ST. Paul University, Kenya, the preservation policy states that

The university library shall endeavor to preserve and provide constant access to ST. Paul University IR by migrating it to new technological platforms when and if the obsolescence of current technologies makes it necessary to do so.

At the Covenant University, Ota, Nigeria, the preservation policy states that

Items will be retained indefinitely. Covenant University Repository will try to ensure continued readability and accessibility. Items will be migrated to new file formats where necessary.

At the Ahmadu Bello University, Zaria, Nigeria the preservation policy states that

Document shall be retained indefinitely. The Repository shall endeavor to ensure continued readability and accessibility through: Migrated to new file formats where necessary; Where possible, provision of software emulations shall be provided to access un-migrated formats.

The findings revealed that only few IRs have well defined digital preservation policy statement. This finding re-echoes earlier findings by Abrizah et al. (2010) who studied the content management policies of OARs in Asian universities and found that a huge score of the repositories had an “undefined” policy for content submission and preservation with a meager score of repositories having a defined “recorded content policy”, “recorded submission policy” and “recorded preservation policy.” “Recorded metadata re-use policy” and “recorded full-text data re-use policy” and it reflected in a low score of repositories. Similarly, Roy et al. (2013) have found that content management policies are prominent in the repositories with a weaker status in terms of preservation policies.

Copyright Policy

Out of the 14 (9.3%) institutional repositories that have one form of IR policy or the other, 10 (6.7%) IRs have policy statements on copyright issues concerning uploading contents to IRs (Table 1). Some copyright policy statements seen in IRs in university libraries in Africa are as follows:

In Kenya, the Kenyatta University IR copyright policy states that

Each University member shall grant to the Kenyatta University permission, upon submission to the IR, to make available his or her scholarly works. The University shall be granted a nonexclusive, irrevocable, worldwide license to exercise all rights under copyright relating to each authors' scholarly works, and to authorize others to do the same, provided that the scholarly works are not sold for a profit.

At the Masinde Muliro University of Science and Technology (MMUST) Kenya, the IR copyright policy states that

Each University member shall grant to MMUST permission to make available his or her scholarly works and to exercise the copyright in these works. More specifically, each faculty member grants to the University a non-exclusive, irrevocable, worldwide license to exercise any and all rights under copyright relating to each of his or her scholarly works, in any

medium, and to authorize others to do the same, provided that these works are not sold for a profit.

At ST. Paul University, its IR copyright policy states that

Authors will retain copyright for the materials they add to the IR. They are responsible for obtaining copyright permission for any published material they submit. The university will have partial claim on copyright for theses/research supervised by its appointed lecturers and/or theses/research work it has funded.

In Nigeria, Ahmadu Bello University, Zaria IR copyright policy states that

The author/owner shall grant Ahmadu Bello University the right to preserve and distribute the work via the Repository. Copyright in a work created in the normal course of employment belongs to Ahmadu Bello University unless there is an agreement, which states otherwise.

At Covenant University, Ota, Nigeria, The IR copyright policy starts that

Items can be deposited at any time, but will not be made publicly visible until any publishers' or funders' embargo period has expired. Any copyright violations are entirely the responsibility of the authors/depositors. If Covenant University Repository receives proof of copyright violation, the relevant item will be removed immediately.

In South Africa, University of Cape Town in its IR policy states that

In line with the provisions of the Intellectual Property Policy and institutional student rules, UCT is granted a right to publish student research theses (doctoral degrees) or dissertations (master's degrees). In terms of the Intellectual Property Policy, the copyright in Scholarly Publication is automatically assigned to the author(s) unless UCT has assigned ownership to a third party in terms of a research contract.

At the University of Pretoria, South Africa, the IR copyright policy states that

The University of Pretoria is the copyright holder of all its theses and dissertations. A request for copyright to be ceded to the student can be made after graduation.

Table 1. Availability of IR policy statements in University Libraries in English-Speaking countries in Africa

S.N.	Universities	Country	Access policy	Submission policy	Content policy	Preservation policy	Copyright issues.	IR address
1	Botho University	Botswana	-	-	-	-	-	http://repository.bothouniversity.ac.bw/buir
2	Botswana International University of Science and Technology	Botswana	√	-	-	-	-	http://repository.biust.ac.bw/
3	University of Botswana	Botswana	-	-	-	-	-	http://www.ubrisa.ub.bw
4	Misr University for Science and Technology, Giza (MUST)	Egypt	-	-	-	-	-	http://dspace.must.edu.eg
5	Future University in Egypt	Egypt	-	-	-	-	-	http://repository.fue.edu.eg
6	British University in Egypt	Egypt	-	-	-	-	-	http://e-prints.bue.edu.eg
7	American University in Cairo	Egypt	-	-	-	-	-	http://dar.aucegypt.edu
8	Haramaya University, Ethiopia	Ethiopia	-	-	-	-	-	http://institutional_repository.http://haramaya.edu.et
9	Addis Ababa University, Ethiopia.	Ethiopia	-	-	-	-	-	http://etd.aau.edu.et
10	Jimma University	Ethiopia	-	-	-	-	-	https://repository.ju.edu.et
11	University for Development Studies	Ghana	√	√	√	√	√	http://www.udsspace.uds.edu.gh
12	University of Ghana	Ghana	-	-	-	-	-	http://ugspace.ug.edu.gh
13	University of Education, Winneba, Ghana	Ghana	-	-	-	-	-	http://ir.uew.edu.gh
14	University of Cape Coast	Ghana	-	√	√	√	-	http://ir.ucc.edu.gh/dspace/
15	University for Development Studies Kwame Nkrumah	Ghana	-	-	-	-	-	http://www.udsspace.uds.edu.gh
16	University of Science and Technology (KNUST)	Ghana	-	-	-	-	-	http://dspace.knust.edu.gh
17	Ashesi University College, Ghana	Ghana	-	-	-	-	-	https://air.ashesi.edu.gh
18	Amref International University	Kenya	-	-	-	-	-	https://repository.amref.org
19	Chuka University, Kenya	Kenya	-	-	-	-	-	http://repository.chuka.ac.ke
20	Dedan Kimathi University of Technology, Kenya	Kenya	-	-	-	-	-	http://repository.dkut.ac.ke:8080/xmlui/
21	Egerton University, Kenya	Kenya	-	-	-	-	-	http://ir-library.egerton.ac.ke/
22	Embu University, Kenya	Kenya	-	-	-	-	-	http://repository.embuni.ac.ke

23	Jomo Kenyatta University of Agriculture and Technology (JKUAT)	Kenya	-	-	-	-	-	-	http://ir.jkuat.ac.ke/
24	Jaramogi Odinga Science and Technology, Bondo (JOOUST)	Kenya	-	-	-	-	-	-	http://ir.jooust.ac.ke
25	Kabarak University, Kenya	Kenya	-	-	-	-	-	-	http://ir.kabarak.ac.ke
26	KCA University, Kenya	Kenya	-	-	-	-	-	-	http://41.89.49.13:8080/xmlui/
27	Karatina University, Kenya	Kenya	√	√	√	√	√	√	https://karospace.karu.ac.ke/
28	Kenya Methodist University	Kenya	-	-	-	-	-	-	http://repository.kemu.ac.ke:8080/xmlui
29	Kenyatta University	Kenya	√	√	√	√	√	√	http://ir-library.ku.ac.ke/
30	Kibabii University	Kenya	-	-	-	-	-	-	https://erepository.kibu.ac.ke
31	Kisii University	Kenya	-	-	-	-	-	-	http://library.kisiiuniversity.ac.ke:8080/xmlui
32	Muranga University of Technology	Kenya	-	-	-	-	-	-	http://repository.mut.ac.ke:8080/xmlui/
33	Maasai Mara University	Kenya	-	-	-	-	-	-	http://mmarau.ac.ke:8080/xmlui/
34	Machakos University	Kenya	-	-	-	-	-	-	http://ir.mksu.ac.ke/
35	Masinde Muliro University of Science and Technology, Kenya	Kenya	-	-	-	-	-	-	http://ir-library.mmust.ac.ke/
36	Meru University of Science and Technology (MUST)	Kenya	-	-	-	-	-	-	https://repository.must.ac.ke/
37	Moi University	Kenya	-	-	-	-	-	-	http://ir.mu.ac.ke/
38	Mount Kenya University	Kenya	-	-	-	-	-	-	https://erepository.mku.ac.ke
39	Murang'a University of Technology	Kenya	-	-	-	-	-	-	http://repository.mut.ac.ke:8080/xmlui/
40	Pwani University	Kenya	-	-	-	-	-	-	http://elibrary.pu.ac.ke/ir/
41	Riara University	Kenya	-	-	-	-	-	-	http://repository.rianauniversity.ac.ke:8080/xmlui/
42	Rongo University	Kenya	-	-	-	-	-	-	http://repository.rongovarsity.ac.ke
43	Strathmore University	Kenya	-	-	-	-	-	-	https://su-plus.strathmore.edu/
44	South Eastern Kenya University	Kenya	-	-	-	-	-	-	http://repository.seku.ac.ke/
45	St. Paul's University	Kenya	-	-	-	-	-	-	http://41.89.51.173:8080/xmlui/
46	Tangaza University College	Kenya	-	-	-	-	-	-	http://repository.tangaza.ac.ke/
47	Technical University of Mombasa	Kenya	-	-	-	-	-	-	https://ir.tum.ac.ke
48	Catholic University of Eastern Africa	Kenya	-	-	-	-	-	-	http://ir.cuea.edu/jspui/

48	The Co-operative University of Kenya	Kenya	-	-	-	-	-	-	https://repository.cuk.ac.ke/xmlui/
49	The Management University of Africa	Kenya	-	-	-	-	-	-	http://repository.mua.ac.ke
50	Tukenya University of Kenya	Kenya	-	-	-	-	-	-	http://repository.tukenya.ac.ke/
51	United States International University – Africa	Kenya	-	-	-	-	-	-	http://erepo.usiu.ac.ke/
52	University of Eldoret	Kenya	-	-	-	-	-	-	http://41.89.164.27:8080/xmlui
53	University of Nairobi	Kenya	-	-	-	-	-	-	http://erepository.uonbi.ac.ke
54	University of Kabianga (UoK)	Kenya	-	-	-	-	-	-	http://ir-library.kabianga.ac.ke/
55	Libyan International Medical University	Libya.	-	-	-	-	-	-	http://repository.limu.edu.ly/
56	Sebha University, Libya.	Libya.	-	-	-	-	-	-	http://dspace.sebhau.edu.ly/
57	University of Tripoli, Libya.	Libya.	-	-	-	-	-	-	http://oa.uot.edu.ly
58	University of Namibia	Namibia	-	-	-	-	-	-	http://repository.unam.na/
59	Afe Babalola University	Nigeria	-	-	-	-	-	-	http://eprints.abuad.edu.ng/
60	Ahmadu Bello University, Zaria	Nigeria	-	-	-	-	-	-	https://kubanni.abu.edu.ng/home
61	Ambrose Alli University Ekpoma	Nigeria	-	-	-	-	-	-	http://154.68.224.61:8080
62	American University of Nigeria (AUN)	Nigeria	-	-	-	-	-	√	http://digitallibrary.aun.edu.ng:8080/xmlui/
63	Bingham University	Nigeria	-	-	-	-	-	-	http://34.29.95.55:8080/xmlui/
64	Benue State University	Nigeria	-	-	-	-	-	-	http://bsuir.bsum.edu.ng
65	Covenant University, Ota	Nigeria	√	√	√	√	√	√	http://eprints.covenantuniversity.edu.ng/
66	Ebonyi State University	Nigeria	-	-	-	-	-	-	http://ir.ebsu.edu.ng:8080/
67	Elizade University	Nigeria	-	-	-	-	-	-	http://repository.elizadeuniversity.edu.ng
68	Federal University Ndufu Alike-Ikwo	Nigeria	-	-	-	-	-	-	http://dspace.funai.edu.ng/
69	Federal University Dutsin-ma	Nigeria	-	-	-	-	-	-	http://dspace.fudutsinma.edu.ng/jspui/
70	Federal University of Technology, Akure	Nigeria	-	-	-	-	-	-	http://dspace.futa.edu.ng:8080/jspui/
71	Federal University Lokoja	Nigeria	-	-	-	-	-	-	http://repository.fulokoja.edu.ng/
72	Federal University Oye Ekiti	Nigeria	-	-	-	-	-	-	http://www.repository.fuoye.edu.ng/
73	Federal University of Technology, Minna	Nigeria	-	-	-	-	-	-	http://dspace.futminna.edu.ng/jspui/
74	Federal University of Technology, Owerri.	Nigeria	-	-	-	-	-	-	http://repository.futo.edu.ng/
75	Landmark University	Nigeria	√	√	√	√	√	√	http://eprints.lmu.edu.ng/
76	Nassarawa State University	Nigeria	-	-	-	-	-	-	https://keffi.nsuk.edu.ng/home
77	University of Ibadan	Nigeria	-	-	-	-	-	-	http://ir.library.ui.edu.ng/

78	University of Ilorin	Nigeria	-	-	-	-	-	http://uilspace.unilorin.edu.ng:8081/jsp/ui
79	University of Jos	Nigeria	-	-	-	-	-	http://irepos.unijos.edu.ng/jspui
80	University of Lagos	Nigeria	-	-	-	-	-	https://ir.unilag.edu.ng/
81	University of Nigeria Nsukka	Nigeria	-	-	-	-	-	http://www.repository.unn.edu.ng http://unn.edu.ng/chart/repo
82	Usmanu Danfodiyo University, Sokoto	Nigeria	-	-	-	-	-	http://oer.udusok.edu.ng:8080/xmlui
83	University of Rwanda	Rwanda	-	-	-	-	-	http://dr.ur.ac.rw/
84	MKU University Rwanda	Rwanda	-	-	-	-	-	http://repository.mkurwanda.ac.rw
85	Central University of Technology, Free State,	South-Africa	-	-	-	-	-	http://ir.cut.ac.za/
86	Cape Peninsula University of Technology	South-Africa	√	√	√	√	√	http://etd.cput.ac.za/ http://digitalknowledge.cput.ac.za/xmlui
87	Durban University of Technology, SA.	South-Africa	-	-	-	-	-	http://ir.dut.ac.za/ http://openscholar.dut.ac.za
88	Mangosuthu University of Technology	South-Africa	-	-	-	-	-	https://hungu-mut.figshare.com
89	North-West University	South-Africa	-	-	-	-	-	https://repository.nwu.ac.za https://dspace.nwu.ac.za/
90	Rhodes University	South-Africa	-	-	-	-	-	https://researchdata.ru.ac.za
91	Stellenbosch University	South-Africa	-	-	-	-	-	http://scholar.sun.ac.za/ http://digital.lib.sun.ac.za/
92	Tshwane University of Technology	South-Africa	-	-	-	-	-	http://encore.tut.ac.za/iii/cpro
93	University of Cape Town	South-Africa	√	√	√	√	√	http://open.uct.ac.za/ http://pubs.cs.uct.ac.za/
94	University of Fort Hare	South-Africa	-	-	-	-	-	http://ufh.netd.ac.za/
95	University of Johannesburg (UJ)	South-Africa	√	-	-	-	-	http://etd.rau.ac.za/ https://ujdigispace.uj.ac.za/
96	University of KwaZulu-Natal (UKZN)	South-Africa	-	-	-	-	-	https://researchspace.ukzn.ac.za/
97	University of Limpopo	South-Africa	-	-	-	-	-	http://ul.netd.ac.za/ http://ulspace.ul.ac.za
98	University of the Free State	South-Africa	-	-	-	-	-	http://scholar.ufs.ac.za/ http://etd.uovs.ac.za/
99	University of Pretoria (UP)	South-Africa	√	√	-	-	√	http://repository.up.ac.za/
100	University of South Africa (UNISA)	South-Africa	-	-	-	-	-	http://uir.unisa.ac.za/
101	University of the Western Cape	South-Africa	-	√	-	-	-	http://etd.uwc.ac.za/xmlui/ , http://repository.uwc.ac.za/xmlui/
102	University of the Witwatersrand, Johannesburg	South-Africa	-	-	-	-	-	http://wiredspace.wits.ac.za/
103	University of Zululand	South-Africa	-	-	-	-	-	http://library.unizulu.ac.za
104	University of Venda	South-Africa	-	-	-	-	-	https://univendspace.univen.ac.za/

105	Vaal University of Technology	South-Africa	-	-	-	-	-	http://vut.netd.ac.za/
106	Al-Neelain University, Sudan	Sudan.	-	-	-	-	-	http://repository.neelain.edu.sd:8080/xmlui
107	Alsalam University	Sudan	-	-	-	-	-	http://alsalam.edu.sd:9090/xmlui/
108	Elsheikh Abdallah Elbadri University	Sudan	-	-	-	-	-	https://dseaeu.edu.sd
109	International University of Africa, Sudan.	Sudan	-	-	-	-	-	http://dspace.iaa.edu.sd/
110	Nile University	Sudan	-	-	-	-	-	http://repository.nileuniversity.edu.sd
111	Nile Valley University, Sudan	Sudan	-	-	-	-	-	http://dglib.nilevalley.edu.sd:8080/xmlui/
112	Omdurman Islamic University	Sudan	-	-	-	-	-	http://repository.oiu.edu.sd:8080/xmlui
113	Red Sea University, Sudan.	Sudan	-	-	-	-	-	http://repository.rsu.edu.sd/
114	Shendi University, Sudan.	Sudan	-	-	-	-	-	http://repository.ush.sd:8080/xmlui/
115	Sudan University of Science and Technology - SUST.	Sudan	-	-	-	-	-	http://repository.sustech.edu
116	University of Khartoum	Sudan	√	√	√	√	√	http://khartoumspace.uofk.edu
117	University of Science & Technology (UST), Sudan.	Sudan	-	-	-	-	-	http://repos.ust.edu.sd:8080/xmlui
118	University of the Holy Quran and Tasee	Sudan	-	-	-	-	-	http://lib.uofq.edu.sd/index.html
119	West Kordufan University, Sudan	Sudan	-	-	-	-	-	http://dspacewku.repository.edu.sd/
120	White Nile University, Sudan.	Sudan	-	-	-	-	-	http://repository.wnu.edu.sd:8080/xmlui/
121	Muhimbili University of Health and Allied Health Sciences (MUHAS), Tanzania.	Tanzania	-	-	-	-	-	http://dspace.muhas.ac.tz:8080/xmlui/
122	Mzumbe University, Tanzania	Tanzania	-	-	-	-	-	http://scholar.mzumbe.ac.tz/
123	Moshi Co-operative University	Tanzania	-	-	-	-	-	http://repository.mocu.ac.tz/
124	Saint Augustine University of Tanzania (SAUT)	Tanzania	-	-	-	-	-	http://41.93.33.43:8080/xmlui/
125	The State University of Zanzibar (SUZA), Tanzania.	Tanzania	-	-	-	-	-	http://repository.suza.ac.tz:8080/xmlui/
126	Tumaini University Dar Es Salaam College	Tanzania	-	-	-	-	-	http://repository.tudarco.ac.tz
127	Sokoine University of Agriculture, Tanzania	Tanzania	-	-	-	-	-	http://www.suaire.sua.ac.tz
128	The Open University of Tanzania	Tanzania	-	-	-	-	-	http://repository.out.ac.tz
129	University of Dar es	Tanzania.	-	-	-	-	-	http://repository.udsm.ac.tz:8080/x

	Salaam, Tanzania.								mlui/
	University of Dodoma, Tanzania	Tanzania.	-	-	-	-	-	-	http://repository.udom.ac.tz/
130	Bishop Stuart University, Uganda.	Uganda	-	-	-	-	-	-	http://ir.bsu.ac.ug
131	Busitema University, Uganda	Uganda	-	-	-	-	-	-	http://ir.busitema.ac.ug/
132	Gulu University	Uganda	-	-	-	-	-	-	https://ir.gu.ac.ug/
133	Islamic University in Uganda (IUIU)	Uganda	-	-	-	-	-	-	https://ir.iuiu.ac.ug
134	Kabale University	Uganda	-	-	-	-	-	-	https://idr.kab.ac.ug
135	Kampala International University.	Uganda	-	-	-	-	-	-	http://www.ir.kiu.ac.ug
136	Kyambogo University	Uganda	-	-	-	-	-	-	https://kyuspace.kyu.ac.ug
137	Makerere University Business School	Uganda	-	-	-	-	-	-	http://mubsir.mubs.ac.ug
138	Makerere University, Uganda	Uganda	-	-	-	-	-	-	http://makir.mak.ac.ug/
139	Mbarara University, Uganda.	Uganda	-	-	-	-	-	-	http://ir.must.ac.ug/
140	Muni University, Uganda	Uganda	-	-	-	-	-	-	http://dir.muni.ac.ug/
141	Uganda Christian University	Uganda	-	-	-	-	-	-	http://ucudir.ucu.ac.ug
142	Uganda Martyrs University	Uganda	-	-	-	-	-	-	http://ir.umu.ac.ug/
143	University of Zambia	Zambia	-	-	-	-	-	-	http://dspace.unza.zm:8080/xmlui/
144	University of the Free State	Zambia	-	-	-	-	-	-	https://scholar.ufs.ac.za/
145	Chinhoyi University of Technology, Zimbabwe	Zimbabwe	-	-	-	-	-	-	http://scholar.cut.ac.zw/
146	Lupane State University, Zimbabwe	Zimbabwe	-	-	-	-	-	-	http://ir.lsu.ac.zw/
147	Midlands State University, Zimbabwe	Zimbabwe	-	-	-	-	-	-	http://ir.msu.ac.zw:8080/xmlui/
148	National University of Science and Technology (NUST), Zimbabwe.	Zimbabwe	-	-	-	-	-	-	http://ir.nust.ac.zw/
149	University of Zimbabwe	Zimbabwe	-	-	-	-	-	-	http://ir.uz.ac.zw/
150	Zimbabwe Open University.	Zimbabwe							http://www.lis.zou.ac.zw:8080/dspace/

Challenges encountered in implementing IRs in Africa

The institutional repository administrators were asked in an e-mail interview the challenges they encountered in implementing institutional repositories (see Table 2). Identifying such challenges will prompt university libraries that are planning to develop institutional repositories to consider ways to overcome these challenges. The responses were grouped according to similar topics and later ranked according to the most mentioned.

Table 2. Challenges encountered in implementing IRs in Africa.

Challenges mentioned	No of responses	%
Lack of funds	143	95.3
Absence of IR related policies	125	83.3
Inadequate facilities	119	79.3
Challenge of collecting contents from various contributors	97	64.7
Unstable Internet connectivity	86	57.3
Lack of ICT skills	75	50
Copyright issues	69	46

Lack of funds

The qualitative data shows that almost all 143 (95.3%) the respondents mentioned lack of fund as an obstacle in implementing institutional repository. This finding is consistent with the findings of Anyaoku, Nwabueze-Echedom and Baro (2018); Sadiku, Kpakiko and Tsafe (2018). For example, Dlamini and Snyman (2017) conducted a study on institutional repositories in Africa and identified inadequate funding or financial support among others factors as the obstacles to development of IRs in African institutions. Sadiku, Kpakiko and Tsafe (2018) also reported on the issues around building and sustaining an institutional digital repository and its corresponding challenges to global visibility in Nigeria. They argued that building and sustaining an institutional digital repository project requires a strong financial backing.

Absence of IR policies

The qualitative data shows that the majority (125: 83.3%) of the respondents mentioned lack of IR policy. This is an indication that many IRs in Africa are developed without consideration of formulating policy statements to guide the IR development. This finding agrees with recent findings by Adetoro Salau et al. (2020) who found that there is no specific policy for the management of electronic theses and dissertations in Nigerian library repositories. Similarly, the study by Bangani (2018) found that many of the institutional repositories in public universities in South Africa do not have their own open access policy.

Inadequate facilities

The results also revealed that the majority (119: 79.3%) of the respondents mentioned inadequate facilities as challenge to implement IR in Nigerian universities. Institutional repositories are information and communication technology driven, therefore, any university that would develop its IR must devote huge sum of money for information and communication technology infrastructure. Unfortunately, most developing countries particularly in Africa are associated with poor information and communication technology development (Anene, Ozor & Baro, 2020). Development of institutional repositories requires dedicated infrastructure such as hardware and software, stable internet facilities, and so on.

Challenge of collecting contents from various contributors

The results in Table 2 also shows that 97 (64.7%) out of the 150 respondents mentioned collecting contents from contributors as a challenge to development of IRs in university libraries in Africa. Collecting contents such as electronic theses and dissertations and journal articles from authors is a major challenge in building IR in Africa (Jelagat, Odini & Wamukoya, 2021). For example, if submission of electronic theses and dissertations is not made mandatory, masters and Ph.D students will not want to submit their work for the purpose of developing IR with the fears that online access to their full-text theses will increase the chances of misuse of their researches. Faculty members need to also be enlightened and encouraged to submit their journal articles to build IRs.

Unstable Internet connectivity

More than half (86, 57.3%) of the respondents mentioned that unstable Internet connectivity was a challenge to the development of an institutional repository. Evidently, most university libraries in Africa are still struggling with stable, high-speed Internet connectivity (Anene et al., 2020). For university libraries in developing countries to offer world-class services to their users by developing institutional repositories, they need stable, high-speed Internet connectivity

Lack of ICT skills

Half (75: 50%) of the respondents mentioned lack of ICT skills as a challenge to the development of institutional repositories. This finding agrees with the findings of Anyaoku et al. (2019), who report that more than half (12, 52.2%) of the responding institutions in their study indicated that their institutional repository lacked the necessary technical staff with the required skills to handle and manage the institutional repository. This is a problem for many institutional

repositories in Africa, as several studies (Sadiku et al., 2018) have consistently reported an inadequate level of ICT-skilled personnel as one of the major problems facing libraries in Africa.

Copyright issues

Almost half (69: 46%) of the respondents mentioned copyright issues as challenges to developing IRs in Nigeria. Studies have reported that the biggest barrier to self-archiving in IRs is concern about copyright (Baro, Tralagba & Ebiagbe, 2018). The greater the concerns about needing publisher permission or the fear of infringing copyright, the less likely faculty are to self-archive. Most of the universities allow authors to upload the author's own post-print version (the final version formatted by the author in a word-processed document that was accepted for publication by the journal following the review and revision process). In many journals, the uploading of post-prints often has to wait for lengthy embargo period, which in the social sciences tends to be 12-18 months (Rathemacher et al., 2016). That is why, the copyright agreements of each individual journal publisher need to be checked when self-archiving, particularly in relation to restrictions around post-print versions.

Conclusion

The study revealed that only few institutional repositories have IR policies. The results show that IR policies are still not a major consideration for the development of IRs in university libraries in Africa. With the content of institutional repositories growing rapidly, it is important to look at how policies have been developed to guide issues such as content submission, the type of material to be added to the institutional repository, digital preservation and copyright. The need for institutional repository policies is imperative as it provides guidelines for effective development and implementation of the project, ensuring consistency, continuity and support for the institutional initiative to provide an enabling environment for enduring access to information for knowledge and development. The results of this study will inform other universities in Africa and other developing countries on the various policies needed to be formulated to guide development of IRs in the African region.

Author Contributions

All authors contributed equally to the conceptualization of the article and writing of the original and subsequent drafts.

Data Availability Statement

All data generated or analyzed during this study are included in this published article.

Acknowledgements

The authors sincerely appreciate the funding agency for their support.

Ethical considerations

No ethical approval is required as the study did not involve any human participants.

Funding

This research was funded by Tertiary Education Trust Fund (TETFund), Abuja, through the Delta State University, Abraka, Delta State, Nigeria.

Conflict of interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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