Winter 1-25-2022

Strategies for Overcoming Challenges in Digital Preservation of Electronic Theses and Dissertations in Public University Libraries in South-East Nigeria

Jerry E. Friday
Federal University Otuoke, fridayjerry65@gmail.com

Monica Eberechukwu Eze MRS
Enugu State University of Science and Technology,, ezemonica33@yahoo.com

Strategies for Overcoming Challenges in Digital Preservation of Electronic Theses and Dissertations in Public University Libraries in South-East Nigeria

Jerry Eyerinmene Friday

University Library, Federal University Otuoke, Bayelsa State, Nigeria

Email: fridayjerry65@gmail.com

&

Monica Eberechukwu Eze

Email: ezemonica33@yahoo.com

Department of Library and Information Science, Enugu State University of Science and Technology, Nigeria

Abstract

The study examined the strategies for overcoming challenges in digital preservation of electronic theses and dissertations in public university libraries in South-East Nigeria. The study adopted descriptive survey research design. The study population comprised 256 librarians, out of which only 68 digital or institutional repositories librarians were covered. A self-constructed questionnaire was used for data collection. The data collected were analyzed using mean and standard deviation. It was discovered that the major challenges encountered in preserving e-theses and dissertations in those libraries were lack of adequate funding, adequate ICT facilities, skilled staff, poor power supply, absence of staff development programme and digital preservation policy. It was also found that the strategies for overcoming challenges in preserving e-theses and dissertations in the libraries were creation of a digital preservation policy, undergoing continuing education, engaging in staff development programmes, creation of an institutional repository, entering agreements, collaboration, outsourcing funds, community needs assessment, organizational assessment and seeking expert advice while outsourcing ICT was not a strategy for overcoming the challenges. Finally, the investigation found that creation of a digital preservation policy, engaging in staff development programmes, creation of an institutional repository, entering agreements, undergoing continuing education, collaboration, community needs assessment, organizational assessment and seeking expert advice were the effective strategies employed in overcoming challenges in preserving e-theses and dissertations in the libraries, whereas, outsourcing ICT /funds and lobbying management for support were not effective strategies for overcoming the challenges. It was recommended that government and university management should be more committed to supporting the cause of digital preservation in university libraries as sustainable digital preservation efforts cannot be achieved by the libraries alone.

Keywords: University libraries, electronic theses, electronic dissertations, digital preservation, Nigeria

Introduction

The main purpose of university libraries is to provide information resources to aid teaching, learning and research at all levels of study in the university. University libraries particularly serve this purpose at advanced levels of study such as postgraduate study in which powers of inquiry, innovation, creativity and invention are challenged and built. Thus, it has been observed that university libraries are vital to learning and their core roles include acting as a mechanism for promoting literacy, encouraging reading for teaching, innovation, problem solving, cultural building, deep thinking, facilitating inquiry into learning, enhancing social and cultural life, providing support to researchers and access to both recent and past information (Wiche and Tom-George, 2018). Traditionally, university libraries provide access to both print and electronic information. In recent times, university library patrons have developed preference for electronic information resources over print information resources due to their ease of use and convenience. This has compelled university libraries to increase their electronic information resources to their users in order to maintain their continued patronage of their services, thereby sustaining their relevance in this electronic or digital age. Electronic information resources have been described as information resources obtained from the internet (Okore, Asogwa and Eke, 2009). Kumbar, Kotabagi and Lamini (2014) have identified such resources to include electronic journals, electronic books, Online Public Access Catalogues, Compact Disc Read-only-Memory, e-mail publishing, electronic databases, internet resources, electronic theses and dissertations, etc. Electronic theses and dissertations have become a vital part of university library's electronic information resources. In the university libraries, they are mostly made available in the digital libraries or institutional repositories. Baro, Godfrey and Eze (2014) grouped electronic theses and dissertations in institutional repositories into two types: born-digital type i.e., which are theses and dissertations originally created in electronic form and the digitised type which are originally created in print forms and later changed into electronic form by means of scanning. University libraries provide electronic theses and dissertations in view of what such resources have to offer.

Electronic theses and dissertations offer several benefits to the academic community. The benefits of electronic theses and dissertations have been identified to include saving library space, preventing repetition of research, enhancing the visibility and rank of universities, saving cost of scholarship, guaranteeing fast retrieval of information, helping others to connect to theses and dissertations, facilitating the sharing of information, providing room for wider access to theses and dissertations and keeping theses and dissertations safe for posterity (Baro, Godfrey and Eze, 2014; Swain, 2010). In recognition of their benefits, Nigerian university libraries have keyed into the process of converting the print forms of their theses and dissertations into electronic formats. This process is termed "digitisation". Baro, Godfrey and Eze (2014) observed that the process began in Nigerian universities in 1985. Thus, students in Nigerian universities have been enjoying the benefits of electronic theses and dissertations. However, the nature of these resources could deprive students and other researchers of their benefits. Li and Banach (2011) observed that electronic information is delicate and their storage facilities suffer wear and tear and are affected by technological obsolescence. These characteristics of electronic information resources have made it imperative for university libraries to take steps to ensure that their contents stand the test of time. Such steps are called "digital preservation".

Digital preservation, in the context of this study, can be simply defined as the process of giving electronic information resources long life. Digital preservation has been defined as the act of securing digitised and born-digital information resources for a long time so that they can be accessed and used again (Musa and Safiyanu, 2015). According to Etim and Christopher (2012), it is the application of methods and steps to enable people lay hold of digitised and born-digital information resources despite the threats arising from technological changes and media failure. Baucom, Troup, Cote and Mannheimer (2018) assert that digital preservation is more than saving bits and bytes, but also involves the making of plans, policies and putting into use workflows with a view to making electronic information resources authentic and accessible. According to Bahr and Lindlar (2013), digital preservation involves designing formats and offering solutions with a view to integrating data and various kinds of document identifiers into the preservation system, converting same into a package in which they can be treated and monitored in the digital preservation system and including the data into a package. According to Becker and Rauber (2011), digital preservation aims at overcoming the threats arising from obsolescence of electronic information resources and guaranteeing non-stop and genuine long-term access to such resources in a format in which they can be used. Thus, without digital preservation, the obstacles of software and hardware obsolescence and lack of external or secondary storage devices and laid down rules and regulations guiding digital preservation cannot be solved (Sambo, Urhefe and Ejitagha, 2017). This method of information management is applicable to two classes of information resources: "born" digital information resources and information resources which have been digitized from print information resources (Perry, 2014). University libraries around the world have realized the need to carry out digital preservation and this process is not alien to Nigerian university libraries.

While it has been established that digital preservation has found its way into South-East Nigerian university libraries such as Nnamdi Azikiwe University Library and University of Nigeria Nsukka Library (Saminu, 2016), it has been observed that steps taken for securing electronic information resources have far outgrown those of developing countries, particularly African universities (Noonan, 2014). It is not, therefore, surprising that even the few libraries in Nigerian tertiary institutions in digital preservation have not have achieved meaningful success due to a number of insurmountable obstacles (Ifijeh, 2014). Thus, these libraries have to devise ways of either mitigating the effects of these challenges or overcome them. According to Gbaje (2011), trends such as the increased use of the Internet and computers in many information centres, production of electronic information resources and the major challenges encountered in ensuring long-term preservation of electronic information resources point the need for thorough actions to be taken to overcome these challenges. Many libraries, including university libraries, have recognized this need. Thus, Beagrie, Semple, Williams and Wright (2008) earlier observed that solutions for digital preservation are being devised and effective preservation tools and archives are being developed. Beagrie, et al. further noted that teams of research professionals are making serious concerted efforts at overcoming the challenges of guaranteeing access to complex electronic data such as multimedia.

Statement of the Problem

As university libraries across the world take advantage of the opportunities of the digital information environment to meet the demands of the ever-growing and insatiable population of their clients, they are confronted with diverse challenges, which if not overcome may render digital information services ineffective. By extension, their primary objective of supporting particularly the research endeavour of their parent organizations may be defeated in the digital era in which they currently operate. One area of digital information services which is bedeviled by teething challenges is digital preservation of electronic theses and dissertations. The focus of university libraries is on what could be done to address the obstacles that rear their ugly heads in the process so that it would be effective. A number of university libraries around the world have devised different strategies to overcome such obstacles, and as a result, some university libraries have been able to achieve remarkable progress in preservation of electronic theses and dissertations. This has enabled such libraries not only to contribute meaningfully to indigenous research in their parent institutions but also to global research. No study seems to have delved into the strategies for surmounting such challenges in public university libraries in Nigeria. The study, therefore, examined the strategies for overcoming challenges in digital preservation of electronic theses and dissertations in public university libraries in South-East Nigeria.

Scope of the Stud*y*

The main aim of this study was to examine the strategies for overcoming challenges in digital preservation of electronic theses and dissertations in public university libraries in South-East Nigeria. Specifically, the study:

1. Identified the challenges confronting digital preservation of electronic theses and dissertations in public university libraries in South-East Nigeria.
2. Evaluated the strategies for overcoming challenges in digital preservation of electronic theses and dissertations in public university libraries in South-East Nigeria.
3. Determined the effectiveness of the strategies employed in overcoming challenges in digital preservation of electronic theses and dissertations in public university libraries in South-East Nigeria.

Research Questions

The following research questions guided the study:

4. What are the challenges confronting digital preservation of electronic theses and dissertations in public university libraries in South-East Nigeria?
5. What are the strategies for overcoming challenges in digital preservation of electronic theses and dissertations in public university libraries in South-East Nigeria?
6. How effective are the strategies employed in overcoming challenges in digital preservation of electronic theses and dissertations in public university libraries in South-East Nigeria?

Review of Related Review

Challenges Confronting Digital Preservation of Electronic Theses and Dissertations in Public University Libraries

Preservation of electronic theses and dissertations in university libraries could be marred by several challenges. A number of empirical studies have reported these challenges. Ezeani and Ezema (2009) reported that digital preservation librarians at University of Nigeria, Nsukka, lack the totality of skills needed to perform the task. The study identified such skills to include mainly skills to execute trouble-shooting, characterisation of scanned documents and book marking. Gbaje (2011) observed that the rapid growth of electronic information resources presents libraries with the challenge of keeping adequate skilled personnel needed to conduct digital preservation. Okoh and Sambo (2014) identified Nigerian digital preservation obstacles to include low staff development, poor library development initiatives, inadequate funding, absence of managerial assistance and sound rules and regulations guiding digital preservation. Adu and Ngulube (2016) noted that negligible effort has been made in providing information and communication technology equipment to support digital preservation activities in Ghanian academic institutions. Sambo, Urhefe and Ejitagha (2017) revealed that digital preservation in Nigerian libraries is mainly faced by absence of personnel development, digital preservation guidelines, standards, secondary storage equipment, financial resources and legal authority to carry out digital preservation, software/hardware obsolescence and carefree disposition of library personnel towards the process. Gbaje and Mohammed (2017) found lack of regularly providing secondary or external storage facilities for institutional repositories as a digital preservation challenge in several Nigerian academic institutions. Masenya (2018) identified absence of competence, personnel development and knowledge about digital preservation among library personnel in institutions of higher learning in South Africa as digital preservation challenges in those institutions. Anyaoku, Echedom and Baro (2019) found that most of the responding African institutional repositories surveyed, which carried out digital preservation, are not supported by long-term financial commitment and lack competent library personnel. In a recent collaborative research, Masenya and Ngulube (2020) identified absence of institutional support/participation, laid down standards, digital preservation methods/guidelines, resources, funding, personnel training, technological obsolescence, staff incompetence and few chances of collaboration/partnership as challenges militating against efforts to sustain digital preservation in South-African tertiary institutions.

Strategies for Overcoming Challenges in Digital Preservation of Electronic Theses and Dissertations in Public University Libraries

The review of literature relevant to this section of the study has been arranged under the following sub-headings:

Conceptual Clarifications

Training

Training can be viewed as a programme in which someone acquires skills required to perform a task or a series of tasks. According to Singh (2012), training is a learning process that involves the acquisition of knowledge, sharpening of skills, concepts, rules, or changing of attitudes and behaviours to enhance the performance of employees. Training has also been defined as the

process of equipping the workforce with the necessary knowledge, skills and attitude to tackle the job responsibilities (Uzohuo, 2017). Amoah-Mensah (2016) also described training as a formal modification of behaviour through learning which occurs as a result of education, instruction and planned experience.

Continuing Education

"Continuing education", as a term, can be called by different names. Ramaiah and Moorthy (2002) identified the different terms various experts use for continuing education to include continuing professional development, adult education, further education, professional development, life-long learning, vocational training, industrial training or labour training. Harake and Hadagali (2015) defined continuing education as a progressive form of education which professionals undergo after school. Harake and Hadagali further defined continuing education as a form of education in which the practical aspects of a job are taught. Similarly, Majid (2004) views continuing professional education as a systematic way of learning which makes professional abilities to develop and improve, thereby empowering people to do things successfully in a dynamic place of work. In this study, continuing education is seen as a life-long education that someone pursues in his area of specialisation with a view to updating, improving and advancing his knowledge and technical-know how in practice.

Digital Preservation Policy

A digital preservation policy could be described as a set of laid-down rules and regulations about what resources should be preserved, how such resources should be preserved, who should preserve them, for whom they should be preserved and for how long they should be preserved. It can also be defined as a document that spells out areas of compliance by executors and beneficiaries of digital preservation. Becker and Reuber (2011) opined that digital preservation policy is closely connected with statements which give an idea of what is intended to be done and what management has recorded.

Collaboration

Collaboration can be described as a joint effort made by a group of people, agencies, bodies or organisations with a view to achieving a common goal or protecting a common interest. It has also been referred to as a process where a group of people come together and contribute their expertise for the benefit of a shared objective, project or mission (Enakrire, Chisita and Adeyinka, 2020). The purpose of sharing knowledge or information could be the watchword. In this regard, collaboration has been used to depict all forms of agreement between academic institutions, corporate organisation, universities and any combination of two or more parties, in which information and knowledge is shared (Tella, Akinboro and Hammed, 2012). Collaboration could be a result of inadequacies on the part of partners. Thus, Albert (2009) describes collaboration as the pooling of resources by two or more stakeholders or partners to solve a problem that neither can solve individually.

Outsourcing Information and Communication Technology (ICT)

ICT has been conceived as a combination of computers, storage media (which provide processing, storage and retrieval capabilities) and telecommunications (which have the capabilities of transferring and communicating data or information from one workstation to

another) (Oyewumi, Alegbeleye and Onifade, 2015). In a simpler way, ICT has been described as a range of technologies for gathering, storing, retrieving, processing, analyzing and transmitting information (Nwachukwu, Asiegbu and Uzoamaka, 2014). In the same vein, ICT has been defined as electronic gadgets that are used to gather, process, store, retrieve and disseminate or transmit information for the purpose of teaching, learning and research (Madu, Vandi and Chagwa, 2018). In the context of library services, deWatteville and Gilbert (2000) see ICT as the acquisition, analysis, manipulation, storage and distribution of information; and the design and provision of equipment and software for these purposes. Outsourcing ICT can be seen as attempts made to acquire digital preservation ICT facilities from outside a university or university library other than from its management or from the government.

Outsourcing Funds

Funds are financial resources available for executing or implementing a function or a plan. Funding can be simply defined as the process of making available such funds. Funding has been defined as the act of providing resources, usually in form of money or other values such as effort or time for a project, a person, a business, or any other private or public institutions (Olurotimi, 2015). In the context of library services, library funding has been defined as the act of providing or making available financial resources for use in developing and equipping the library (Inyang and Igwechi, 2015). In this study, outsourcing funds is defined as efforts made to obtain digital preservation funds from outside the four walls of a university library or its parent body or through alternative sources of income which could be gifts, donations, endowment or proceeds from reprographic services.

Auditing or Review

Auditing can be defined as the process of appraising the financial practices in an organization or company or institution with a view to ensuring that such practices in line with established financial management rules and regulations. Review could be seen as an attempt made to ensure that organizational activities or practices are being executed as planned and whether they are effective or meeting expected goals. Auditing or review of digital preservation could be seen as the process of monitoring digital preservation activities with a view to ensuring that it is going as planned and achieving its set goals and whether financial allocations to the process are applied or utilized as intended or as spelt out by financial regulations in the university library.

Community or User Needs Assessment

Community or user needs assessment can be defined as the process of identifying the various groups of people who use the university library (students, lecturers and other researchers) and their peculiar information needs. It can also be viewed as the process of getting the profile of the different users of the university library and identifying their information needs. With respect to digital preservation, community or user needs assessment can be described as an attempt made by the university library with a view to identifying the digital preservation needs of its clientele.

Organisational Assessment

Organisational assessment, in the context of this research, could be defined as the process of determining the strengths and weaknesses of a university library with respect to digital preservation. It could also be seen as an attempt to assess the capabilities of a university library in supporting and sustaining a digital preservation programme or project. Moreso, it could be

conceived as a feasibility study on digital preservation conducted on the basis of the financial, human and material resources of a university library. Maemura, Moles and Becker (2015) defined organizational assessment as the means by which the potentials of an organisation's digital preservation are appraised.

Expert Advice

Expert advice could be defined as recommendation which a professional offers to another person who has a need to solve a problem or remedy a situation. It could also be viewed as a piece of advice which is useful to improving, tackling or overcoming a situation or a difficulty.

The review of literature on the strategies for overcoming challenges in digital preservation of electronic theses and dissertations has been organized under two sub-headings: resource-oriented strategies and technical-oriented strategies.

Resource-oriented Strategies for Overcoming Challenges in Digital Preservation of Electronic Theses and Dissertations in Public University Libraries

Scholars have affirmed that training of librarians will go a long way in overcoming digital preservation obstacles. Echezona (2009) revealed that providing librarians opportunities for training is one of the key strategies that enhanced the management of special collections in Nigerian university libraries in an era of challenges. This probably explains why Sanett (2013) stated that expert training for library staff is a prerequisite for keeping personnel aware of what should be preserved and how best to preserve it in a moment when the competencies of personnel seem to fail them. Abdulsalami, Nwachukwu and Salami (2015) observed that raising the level of competence of institutions is the apparent means to solve the problems encountered in executing digital preservation. This level of competence is also believed to be achieved through continuing education. Thus, Ezeani (2009) sees continuing education as the only door to technical competence when information professionals' skills are deficient. Another resource-resource strategy, which is outsourcing Information and Communication Technology (ICT), has also been adjudged as a means of overcoming digital preservation challenges. Ifijeh (2014) contended that maximizing ICT from internal and external sources is the only way to deal with the present digital preservation challenges faced by libraries. Perhaps, in view of the reality that ICT facilities are not adequately provided for public universities by Nigerian government, Agada (1997) observed that it is imperative for Nigerian libraries not only to rally round the Nigerian government for ICT but also to enter into partnerships with international and foreign professional associations and institutions with the aim of acquiring technology to supplement their ICT facilities. It appears university libraries may not be able to achieve meaningful success in digital preservation without funding because almost everything in the process seems to involve finance. ICT appears to consume a larger part of digital preservation funding. In the light of this, Igun (2013) opined that it is expedient for Nigerian libraries to lobby, among others, stakeholders to see the necessity to make adequate financial provision for digital libraries in the country. This is inclusive of digital preservation which forms one of the core practices of digital librarianship in Nigeria. Ishola (2014) observed that the poor funding of libraries in Nigerian institutions of higher learning and inconsistent budgetary allocation to Nigerian universities has affected the quality of library information resources and services. This, according to the author, has led these libraries to introduce fee-based library and information services as an alternative means of

funding. Collaboration has also been classified as another resource-resource strategy and experts have acknowledged that it is a potential strategy for surmounting digital preservation challenges. According to the Council of Canadian Academies (2015), collaboration with private companies and with people engaged in teaching, learning and research has the potential of enabling information centres to come up with new programs and to execute digital preservation initiatives which they cannot handle alone. This realization must have informed the observation by Gbaje and Mohammed (2017) that digital preservation has always relied on collaboration because the process is beyond what one agency can shoulder. Moreso, respondents in the study by Bishoff and Smith (2015) reported that they had carried out digital preservation mainly by making collaborative attempts which include Portico and LOCKSS. In view of the crucial role collaboration plays in overcoming digital preservation obstacles, Verheui (2006) emphasised the necessity for people with competence in technology and preservation to work together with a view to providing enlightenment on the basic concepts of digital preservation to facilitate the process.

Technical-oriented Strategies for Overcoming Challenges in Digital Preservation of Electronic Theses and Dissertations in Public University Libraries

.

Seeking expert advice has been acknowledged as a potential means of overcoming digital preservation challenges. Bähr, Friese, Lindlar and Vlaeminck (2011) observed that digital preservation systems present technical challenges and the task of manning the systems and their data is a responsibility of specialists. Thus, consulting experts or specialists in digital preservation could help university libraries overcome digital preservation challenges. This goes to confirm the observation by Banach, Shepherd, Rubinstein, Shelburne, Canavan and Li (2011) that at the University of Massachusetts Amherst Libraries, decisions regarding choice of electronic information resources for preservation are made by experts based on the value of the content in consultation with the relevant information technology and preservation experts. Another technical-oriented strategy which has been seen as a mechanism for overcoming digital preservation obstacles is entering into agreements with copyright holders. Anyaoku, Echedom and Baro (2019) found that most of the African institutional repositories (IR) surveyed, entered agreements with content owners to preserve submitted content with ease. “Online click-through agreement” with content owners was found to be the main form of agreement followed by “written agreements”. The researchers concluded that African IRs mostly reach copyright or intellectual rights agreement with authors via online click-through method. These institutional repositories enter into agreement with copyright holders with a view to preventing possible fracas between them and the copyright holders. In this regard, Ifijeh (2014) opined that the solution to the problem over copyright that arise between students and universities over uploading of their submitted theses into online repositories, is to recognize both the students and their universities in the citation and use of such theses. Experts have also affirmed that lobbying management for their support in digital preservation efforts could play a critical role in surmounting digital preservation challenges. In this regard, Rinehart, Prud’homme and Huot (2014) opined that getting support from management in digital preservation is instrumental in overcoming the barriers to digital preservation.

Effectiveness of Strategies for Overcoming Challenges in Digital Preservation of Electronic Theses and Dissertations

Effectiveness could be defined as a result-oriented performance of a system or method. It could also be seen as the ability of a system, method, device or strategy to yield the expected or intended outcome. Strategies for overcoming challenges in digital preservation of e-theses and dissertations in university libraries produce different results. While some strategies prove effective, others may not be effective. Thus, university libraries have to come up with appropriate strategies for overcoming the various digital preservation challenges. Masenya and Ngulube (2019) observed that due to the new forms of digital technologies facing libraries in institutions of higher learning, such libraries have to devise strategies to tackle challenges of digital preservation such as permanent loss of information resources with a view to executing the process effectively. Literature on effectiveness of strategies for overcoming challenges in digital preservation of electronic theses and dissertations has been reviewed under effectiveness of resource-oriented strategies and effectiveness of technical-oriented strategies.

Effectiveness of Resource-oriented Strategies in Overcoming Challenges in Digital Preservation in Public University Libraries

Scholars have affirmed that training can go a long way in helping personnel overcome digital preservation challenges effectively. The Council of Canadian Academies (2015) identified human resource development as one of the enabling conditions which make digital preservation efforts successful in the face of digital preservation obstacles. This is perhaps why Gbaje (2011) argued that if librarians/information professionals do not receive special training programmes on digital preservation, such personnel will not be able to execute the process effectively when confronted with digital preservation hindrances. This relevance of training could explain the result of the research by Ugwu and Ekere (2010) that library personnel at the University of Nigeria Nsukka see staff training as the most important strategy for digital preservation.

Closely related to training as a perceived strategy for dealing with digital preservation challenges is continuing education. Majid (2004) views continuing professional education as a potential means for empowering people to do things successfully in a dynamic and challenging place of work. Harake and Hadagali (2015) acknowledged that the skills and knowledge continuing education offers Library and Information Science professionals have the capacity of empowering these professionals to man library and information centres effectively in a complex information environment. Consequently, Saka, Oyedum and Song (2016) affirmed that it is by undergoing formal professional education, attending seminars, conferences, workshops, writing articles for publication in recognised journals and chapters in textbooks and undergoing mentoring, on-the-job training, that librarians will acquire the skills required of them to discharge their professional responsibilities effectively when their competence is put to test.

Another strategy perceived by experts to have a critical role to play in tackling digital preservation challenges effectively is collaboration. Dollar and Ashley (2014) posit that an organisation which is charged with the responsibility for digital preservation in a trying digital information environment performs well by continuing in collaborative initiatives and by helping collaborative efforts to grow among its stakeholders. Skinner and Halbert (2009) observed the common expert argument that collaboration is the only means by which the daunting challenges of digital preservation can be effectively tackled. Moreso, the Council of Canadian Academies (2015) identified creating collaborations and partnerships as one of the enabling conditions

which make digital preservation efforts successful when confronted by digital preservation problems. Baucom, Troup, Cote and Mannheimer (2018) stated that people at many levels of authority carry out digital preservation and due to its challenges, organisational administrators and stakeholders have to collaborate to make it successful.

Outsourcing ICT has been conceived as another strategy which has the potential of enabling university libraries deal with digital preservation obstacles effectively. In this regard, the Council of Canadian Academies (2015) identified the promotion of standardised and generic information and communications technologies (ICT) infrastructure through internal and external sources as one of the enabling conditions which an institution should provide to make digital preservation efforts successful. Outsourcing funds has also been has perceived as a potential device for overcoming digital preservation challenges effectively. In this connection, Ifijeh (2014) sees the necessity of sourcing funds from internal and external sources, identifying possible supplementary sources of funds to include sourcing funds from non-governmental agencies, international agencies, enforcing and collecting ICT levies from graduating students (at the point of submitting their theses), making appeals to graduated students of universities, carrying out library advocacy especially to university management and to philanthropic organizations. Furthermore, the Council of Canadian Academies (2015) identified outsourcing and developing funding resources as one of the enabling conditions which make digital preservation efforts successful in the face of digital preservation obstacles.

Effectiveness of Technical-oriented Strategies for Overcoming Challenges in Digital Preservation in Public University Libraries

Creating a digital preservation policy has been seen by experts as an avenue to overcoming digital preservation challenges effectively. Electronic Resource Preservation and Access Network (2003) observed that a digital preservation policy brings about coherence in the execution of the steps involved in the process when it tends to be in disarray. Similarly, Davies (2000) in his Policy, Strategy and Resources (PSR) Troika model argued that the development of digital preservation policies is not only one of the key factors that contribute to sustainable digital preservation but also an element which leads to effective digital preservation in academic libraries in a era of complexities and challenges. Okoh and Sambo (2014) observed that the creation and use of a digital preservation policy helps an information professional to escape confusion about the process and empowers him to execute the process with ease. Getting management support for digital preservation has also been perceived as an effective means for tackling digital preservation problems. In this regard, Rinehart, Prud'homme and Huot (2014) observed that, for an institution to effectively, efficiently and successfully carry out digital preservation in face of complexities, there is need for experts to be involved in the process. Another technical-oriented strategy which has been believed to help information professionals confront digital preservation challenges effectively is entering into agreement. In this respect, the Council of Canadian Academies (2015) identified managing the various copyright issues as one of the enabling conditions which make digital preservation efforts successful. Securing the approval of management has also been viewed as an effective means. The Council of Canadian Academies (2015) identified the prioritisation of digital opportunities by senior management as one of the enabling conditions which an institution should provide to make digital preservation efforts successful. Consequently, in their Digital Preservation Triad, Corrado and Moulaison (2014) identified management as one of the core three elements that work together to support digital preservation. Auditing or review of digital preservation has also been believed to be an

effective device. Thus, in the light of the obstacles of digital preservation, Becker and Rauber (2011) noted that keeping the content of electronic information resources authentic and providing access to their content over time needs an audit process or an accountability review. In view of its relevance, Becker and Rauber recommended continuous auditing of all aspects of digital preservation, including preservation planning, with a view to achieving effective long-term preservation. Community or user needs assessment surfaces among the perceived effective strategies. For instance, Ifejah (2011) affirmed that, in an attempt to overcome unnecessary flaws in information service effectively, identifying the distinct group of users and their needs will enable the library to focus on the productive services to render and also create an opportunity to discover ways to meet users' needs. Wiche and Tom-George (2018) also argued that the job of selecting, purchasing and disseminating information resources will only be effective if a user's need assessment is carried out regularly to identify the strength, opportunity, weakness and threats of the library as it concerns the satisfaction of the users and the user community. Specifically, Kirchhoff (2009) observed that responding to community needs is essential to successful preservation. A university library which kicks off digital preservation without first taking steps to find out whether it is capable of catering for the process may find itself in a lot of trouble as the process progresses. Thus, experts admit that organizational assessment is an effective strategy for combating digital preservation challenges. Thus, Maemura, Moles and Becker (2015) assert that organizational assessment is a crucial element of effective digital preservation because it is necessary to demonstrate its efficacy. Maemura, et al. further noted that the display of this efficacy of digital preservation is not only a key to effective improvement but also a means by which stakeholders establish trust in digital objects, systems and repositories.

Methods

The study adopted descriptive survey research design. The study was carried out in South-East Nigeria and it covered ten (10) public university libraries in South-East Nigeria which operate digital libraries/institutional repositories. The population of the study comprised all the two hundred and fifty six (256) librarians working in the ten (10) public university libraries in South-East Nigeria. The study, however, covered only the 68 librarians working in the digital libraries/institutional repositories in these university libraries. This was to ensure that objective and reliable responses were obtained from the respondents. The instrument for data collection was a self-constructed questionnaire. The instrument was titled "Strategies for Overcoming Challenges in Digital Preservation of Electronic Theses and Dissertations Questionnaire". The questionnaire consisted of two parts: Part A and B. Part A elicited information on the background of the respondents while Part B had three (3) sections with Section A dealing with "Challenges in Digital Preservation of Electronic Theses and Dissertations", Section B with "Strategies for Overcoming Challenges in Digital Preservation of Electronic Theses and Dissertations" and Section C with "Effectiveness of Strategies for Overcoming Challenges in Digital Preservation of Electronic Theses and Dissertations". The instrument used four-point response category of "Strongly Agree (4)", "Agree (3)", "Disagree (2)" and "Strongly Disagree (1)" for the sections on "Challenges in Digital Preservation of Electronic Theses and Dissertations and Strategies for Overcoming Challenges in Digital Preservation of Electronic Theses and Dissertations", whereas, a four-point response category of "Very Effective (4)", "Effective (3)", "Fairly Effective (2)" and "Not Effective (1)" was adopted for the section on "Effectiveness of Strategies for Overcoming Challenges in Digital Preservation of Electronic

Theses and Dissertations". The instrument was validated by two experts in the Department of Library and Information Science and one expert in Measurement and Evaluation, all in Nnamdi Azikiwe University, Awka, Anambra State, Nigeria. Reliability test was not conduced on the instrument based on the opinion of Nworgu (2015) that once a test is valid, it tends to be reliable. The researcher moved round the universities and administered 68 questionnaires by hand to the librarians in the digital libraries/institutional repositories in the public university libraries with the help of research assistants. The researcher immediately collected the questionnaires filled in on the spot while the rest were retrieved from the research assistants later upon completion. All the 68 questionnaires were properly completed by the librarians and retrieved, producing a response rate of 100%. The data collected was then analyzed using mean and standard deviation.

Results

Research Question 1: What are the challenges confronting digital preservation of e-theses and dissertations in public university libraries in South-East Nigeria?

Table 1: Mean Ratings of Responses on Challenges Confronting Digital Preservation of E-Theses and Dissertations in Public University Libraries in South-East Nigeria

S/N	Challenges	$\bar{X}$	SD	Remarks
1.	Absence of digital preservation policy	3.45	0.34	Agreed
2.	Poor internet connectivity	3.40	0.74	Agreed
3.	Lack of adequate ICT facilities	3.66	0.47	Agreed
4.	Lack of skilled staff	3.63	0.72	Agreed
5.	Legal challenges (copyright issues)	2.99	0.69	Agreed
6.	Poor power supply	3.63	0.48	Agreed
7.	Lack of adequate funding	3.69	0.57	Agreed
8.	Lack of staff commitment/ management support	3.22	0.82	Agreed
9.	Technological obsolescence	2.87	0.72	Agreed
10.	Lack of continuing education	3.35	0.64	Agreed
11.	Lack of staff development programmes	3.46	0.74	Agreed
	Grand Mean and Standard Deviation	3.40	0.63	Agreed

Table 1 shows that all the listed challenges are obstacles to digital preservation but the major challenges encountered in digital preservation of e-theses and dissertations by public university libraries in South-East Nigeria are lack of adequate funding, lack of adequate ICT facilities, lack of skilled staff, poor power supply, lack of staff development programme and absence of digital preservation policy. The grand mean of 3.40 also indicates that respondents agreed that all the listed items are challenges to digital preservation of e-theses and dissertations by public university libraries in South-East Nigeria.

Research Question 2: What are the strategies for overcoming challenges in digital preservation of e-theses and dissertations in public university libraries in South-East Nigeria?

Table 2: Mean Ratings of Responses on Strategies for Overcoming Challenges in Digital Preservation of E-Theses and Dissertations in Public University Libraries in South-East Nigeria

S/N	Strategies	$\bar{X}$	SD	Remarks
1.	Creation of a digital preservation policy	3.19	0.77	Agreed
2.	Undergoing continuing education	3.26	0.96	Agreed
3.	Training of staff	2.97	1.00	Agreed
4.	Collaboration	3.04	0.85	Agreed
5.	Outsourcing funds	3.32	0.72	Agreed
6.	Outsourcing ICT	2.40	0.49	Disagreed
7.	Entering into agreements	2.97	0.88	Agreed
8.	Auditing or review	3.83	0.74	Agreed
9.	Community needs assessment	3.00	0.70	Agreed
10.	Organisational assessment	3.69	0.51	Agreed
11.	Seeking expert advice	3.37	0.68	Agreed
12.	Lobbying management for support	3.10	1.00	Agreed
	Grand Mean and Standard Deviation	3.18	0.78	Agreed

Table 2 shows that the respondents agreed that the strategies for overcoming challenges in digital preservation of e-theses and dissertations in public university libraries in South-East Nigeria are creation of a digital preservation policy, undergoing continuing education, training of staff, collaboration, outsourcing funds, entering into agreements, auditing or review, community needs assessment, organizational assessment, seeking expert advice and lobbying management for support. On the other hand, they do not adopt outsourcing ICT as a strategy for overcoming such challenges. On the whole, the grand mean of 3.18 shows that respondents see most of the listed items as strategies for overcoming challenges in digital preservation of e-theses and dissertations in public university libraries in South-East Nigeria.

Research 3: How effective are the strategies employed in overcoming challenges in digital preservation of electronic theses and dissertations in public university libraries in South-East Nigeria?

Table 3: Mean Ratings of Responses on Effectiveness of Strategies for Overcoming Challenges in Digital Preservation of E-Theses and Dissertations in Public University Libraries in South-East Nigeria

S/N	Strategies	$\bar{X}$	SD	Remarks
1.	Creation of a digital preservation policy	3.13	0.94	Effective
2.	Undergoing continuing education	3.31	0.79	Effective
3.	Training of staff	3.44	0.72	Effective
4.	Collaboration	3.24	0.72	Effective
5.	Outsourcing ICT	1.64	0.93	Not Effective
6.	Entering into agreements	2.85	0.83	Effective
7.	Outsourcing funds	1.78	1.01	Not Effective
8.	Auditing or review	3.38	0.66	Effective
9.	Community needs assessment	2.97	0.94	Effective
10.	Organisational assessment	3.34	0.63	Effective
11.	Seeking expert advice	3.71	0.87	Effective
12.	Lobbying management for support	2.07	0.84	Not Effective
	Grand Mean and Standard Deviation	2.91	0.82	Effective

Table 3 reveals that the respondents agreed that creation of a digital preservation policy, undergoing continuing education, training of staff, collaboration, entering into agreements, auditing or review, community needs assessment, organisational assessment and seeking expert advice are effective strategies for overcoming challenges in digital preservation of electronic theses and dissertations in public university libraries in South-East Nigeria effective. Whereas, outsourcing ICT, outsourcing funds and lobbying management for support do not prove effective as strategies for overcoming digital preservation challenges. Collectively, the grand mean of 2.91 reveals that respondents view majority of the listed items as effective strategies for overcoming challenges in digital preservation of electronic theses and dissertations in public university libraries in South-East Nigeria.

Discussion

The study discovered that the core challenges encountered in digital preservation of e-theses and dissertations by public university libraries in South-East Nigeria are lack of adequate funding, adequate ICT facilities, skilled staff, poor power supply, staff development programme and digital preservation policy. The finding affirms the finding of the work by Ezeani and Ezema (2009) that librarians at University of Nigeria, Nsukka, involved in digital preservation are yet to fully possess the range of competencies required for the task. It is also in agreement with the result of the study by Okoh and Sambo (2014) that digital preservation challenges in Nigeria included, among others, lack of standard policies, poor funding and low capacity building for libraries and librarians. The finding is also in consonance with the outcome of the research by Sambo, Urhefe and Ejitagha (2017) that the major challenges facing digital preservation in Nigerian libraries included lack of training, policy and funds. The result of the study is also in line with the finding of the research by Anyaoku, Echedom and Baro (2019) that out of the African institutional repositories (IRs) surveyed, most of them lacked long-term funding and competent technical staff required to handle and manage the IRs. This outcome of the study could probably be as a result of the fact that both state and federal governments have remained non-challant towards the development of public universities in Nigeria and as such, the libraries keep dealing with challenges of the past, thus, resulting in similar findings.

The research also found that the strategies for overcoming challenges in digital preservation of e-theses and dissertations in public university libraries in South-East Nigeria are creation of a digital preservation policy, undergoing continuing education, entering agreements, giving personnel training, collaboration, outsourcing funds, auditing or review, community needs assessment, organizational assessment, seeking expert advice and lobbying management for support while outsourcing ICT is not a strategy for overcoming such challenges. On training of staff, the result of the study is in line with the previous finding that training opportunities greatly improves special collections management (Echezona (2009) and with the notion that training is serves as tool for awareness and education on the best digital preservation practices (Sanett, 2013). Moreso, the result agrees with the observation by Abdulsalami, Nwachukwu and Salami (2015) that improved competence resulting from training is an obvious solution to digital preservation obstacles. Similarly, the finding of the study lends credence to the affirmation of Ezeani (2009) that the only door to technical competence is continuing education. On creation of a digital preservation policy, the result of the research is consistent with previous report that a recorded collection building policy is a key to management of special information resources (Echezona, 2009). On collaboration, the result of the study agrees with the view that digital preservation has always been dependent on collaboration (Gbaje and Mohammed, 2017) and with the report that information professionals had achieved the process mainly on the basis of collaboration (Bishoff and Smith, 2015). On seeking expert advice, the result is consistent with the practice of the University of Massachusetts Amherst Libraries where digital preservation and ICT experts are assigned the role of deciding what electronic collections should be preserved (Banach, Shepherd, Rubinstein, Shelburne, Canavan and Li, 2011). On lobbying management for support, the result of the study also confirms the view of Rinehart, Prud'homme and Huot (2014) that getting support from management is instrumental in overcoming the barriers to digital preservation. On outsourcing ICT for digital preservation, the finding of the study nullifies the recommendation of Agada (1997) that Nigerian libraries should partner with external bodies to acquire technology to supplement theirs. On funding, the outcome of the research confirms

Ishola's (2014) observation that outsourcing funds through fee-based library services has been adopted by Nigerian libraries as a means of obtaining extra income to help provide information services in the face of dwindling government budgetary allocations. As regards entering into agreements, the finding strengthens the recommendation of Ifijeh (2014) that the solution to contentions over copyright arising between students who submit theses and dissertations and universities which upload them to repositories is to recognize both the students and their universities in the citation and use of information items. The finding also corroborates the result of the study by Anyaoku, Echedom and Baro (2019) who found that most of the African institutional repositories (IR) surveyed, entered agreements with content owners to preserve submitted content. The researcher is of the opinion that this finding could be due to the fact that many of the public university libraries in Nigeria have realized that digital preservation is highly technical, cost-effective, needs a policy to provide guidance and direction for the process and also requires an assessment and this might have compelled such libraries to collaborate, seek expert advice, engage personnel in training and outsource funds, conduct needs assessment, e.t.c. The result that outsourcing ICT is not employed as a strategy for overcoming digital preservation challenges could be a pointer to the fact that Nigerian public university libraries are fully dependent on the government for library development including provision of ICT facilities in the libraries.

Finally, the investigation found that creation of a digital preservation policy, training of staff, collaboration, undergoing continuing education, entering into agreements, auditing or review, community needs assessment, organisational assessment and seeking expert advice are effective strategies employed in overcoming challenges in digital preservation of electronic theses and dissertations in public university libraries in South-East Nigeria, whereas, outsourcing ICT, outsourcing funds and lobbing management for support are not effective strategies. Specifically, on training of staff, the finding agrees with the report by Ugwu and Ekere (2010) that training is perceived by librarians as the primary means for tackling digital preservation challenges effectively. The finding also agrees with Gbaje (2011) who associates digital preservation effectiveness to training. On continuing education, the finding is in line with the views that continuing education not only empowers people to do things successfully at work (Majid, 2004) but also to man library and information centres effectively (Harake and Hadagali, 2015). The finding also agrees with Saka, Oyedum and Song (2016) who contend that continuing education is the only means which empowers information professionals to perform their duties well and with ease. On creation of a digital preservation policy, the result of the research confirms the notions that the creation and use of a digital preservation policy not only results in a smooth digital preservation process which is devoid of confusion (Electronic Resource Preservation and Access Network, 2003; Okoh and Sambo, 2014) but also leads to sustainability and effectiveness in the process (Davies (2000). On funding, the result that outsourcing funds is not an effective strategy, disagrees with the view of Ifijeh (2014) that it is necessary to source funds from internal and external sources to supplement funding for digital preservation. On collaboration, the finding also corroborates commonly-held expert opinion that collaboration is the only means to effectively overcome dreary digital preservation obstacles (Skinner and Halbert, 2009), improves performance in the task (Dollar and Ashley, 2014) as well as facilitates its success (Council of Canadian Academies, 2015). On entering into agreements, the finding agrees with Council of Canadian Academies (2015) that managing the various copyright issues facilitates achievement of success in digital preservation. On lobbying management for support for digital preservation, the result is line with the assertion by the Council of Canadian Academies (2015) that the

premium management places on digital preservation opportunities facilitates the accomplishment of its goals. Moreso, on auditing or review, the result affirms the recommendation of Becker and Rauber (2011) that continuous auditing of the whole digital preservation process can yield effective long-term preservation benefits. On community needs assessment, the result is consistent with perceptions that community needs assessment is not only a key to achieving success in digital preservation (Kirchhoff, 2009) but also leads to effective library and information services (Ifejah, 2011; Wiche and Tom-George (2018). On organizational assessment, the outcome is in agreement with Maemura, Moles and Becker (2015) who opined that organizational assessment is a fundamental factor in effective digital preservation. The researchers are of the view the result that creation of a digital preservation policy, giving personnel staff development programmes, collaboration, undergoing continuing education, entering into agreements, auditing or review, community needs assessment, organisational assessment and seeking expert advice are effective strategies may be due to the fact that digital preservation requires expertise and a digital information environment whose users' digital information needs must be known and requires technical-know how to support the process and ensure that it achieves its objectives. On the other hand, the finding that outsourcing ICT, outsourcing funds and lobbying management for support are not effective strategies may arise from the fact that many philantropists in Africa and in Nigeria in particular, do not attach importance to educational development and as such, are reluctant to donate information and communication technology facilities, gifts and donations/endowment to support the cause of digital preservation in Nigerian public universities. Furthermore, university management seems not to see the cause of university libraries as relevant to the accomplishment of the overall aims of universities. As such, they feel reluctant to support their cause.

Conclusion

It is clear that concerted efforts are being made by public university libraries in South-East Nigeria with a view to addressing core challenges encountered in preserving e-theses and dissertations generated in the universities they serve. In the face of challenges such as absence of adequate funding, sufficient ICT facilities, competent staff, staff development programme, digital preservation policy and poor power supply, such libraries have devised strategies for overcoming the obstacles including creation of a digital preservation policy, undergoing continuing education, entering *into* agreements, giving personnel training, collaboration, outsourcing funds, seeking expert advice and lobbying management for support. In spite of this inspiring initiative, only some of these strategies have proven feasible in addressing the challenges and such strategies include creation of a digital preservation policy, staff training, collaboration, undergoing continuing education, entering into agreements, auditing or review, community needs assessment and organisational assessment.

Recommendations

In the light of the findings of the study, it was recommended that:

- Government should be more committed to providing adequate funding for Nigerian public universities as this would enable their libraries to meet financial commitments to provision of sufficient ICT facilities, training of personnel and generating power for digital preservation. This could be achieved by increasing the yearly budgetary allocation to such universities and by increasing intervention funds such as TETFUND.

- Public university libraries should devise internal and external training programmes for their personnel to equip them with the technical competence for digital preservation. This could be realized by engaging their staff in induction training, digital preservation seminars and workshops e.t.c.
- Concerted efforts should be made by public university libraries to formulate digital preservation policies to provide direction and coordination for digital preservation in their respective libraries. The formulation process could be executed by emulating the digital preservation policy templates of university libraries which have made significant process in digital preservation and seeking expert advice and engagement in the formulation task.
- Public university libraries should cultivate the culture of lobbying philanthropists and external agencies or organisations for ICT support as government alone may not be able to fully meet the financial requirements for digital preservation.

References

Abdulsalami, T. L., Nwachukwu, V. N. and Salami, P. F. (2015). Digitisation and preservation as means of accessing information in Nigerian university libraries: a case study of Bayero University, Kano and Kashim Ibrahim Library, Ahmadu Bello University, Zaria. *International Journal of Education and Practice*, 3 (12), 305

Adu, K. K., & Ngulube, P. (2016). Preserving the digital heritage of public institutions in Ghana in the wake of electronic government. *Library Hi Tech*, 34 (4), 748–763. https://doi.org/10.1108/LHT-07-2016-0077

Agada, J. (1997) Nigerian librarianship: *A first Centennial Report.* http://www.worlib.org/vol07no2/agada_v07n2.shtml

Albert, S. (2009). *Networked communities: Strategies for digital collaboration.* IGI Global. Retrieved from https://doi.org/10.4018/978-1-59904-771-3

Altman, M., et al. (2009). Digital preservation through archival collaboration: The data preservation alliance for the social sciences. *Am Arch*, 72 (1), 170–184

Amoah-Mensah, A. (2016). Training and development process and employee performance in the Bar industry. *Journal of Research and Development (JRND)*, 3 (1), 34

Anyaoku, E. N., Echedom, A. U., & Baro, E. E. (2019). Digital preservation practices in university libraries: an investigation of institutional repositories in Africa. *Digital Library Perspectives*, 35 (1), 42-56. https://doi.org/10.1108/DLP-10-2017-0041

Bähr, T., & Lindlar, M. (2013). *Varying realities – a SWOT analysis of a consortially-operated digital preservation system.* https://www.researchgate.net/publication/

Bähr, T., Friese, Y., Lindlar, M., & Vlaeminck, S. (2012). *Evaluierung eines kooperativ betriebenen LZA-Systems – Projekt Abschlussbericht.* Hannover: Kiel, Köln.

Banach, M., et al. (2011). *University of Massachusetts Amherst Libraries*. https://er.educause.edu › articles › digital-preservation

Baro, E. E., Godfrey, Z. V., & Eze, M. E. (2014). Electronic theses and dissertations initiatives: A survey of university libraries in Nigeria. *International Information and Library Review*, 46 (1 & 2), 41. http://www.tandfonline.com/loi/ulbr20

Baucom, E., Troup, T., Cote, C., and Mannheimer, S. (Winter 2018). Building strategic alliances to support advocacy and planning for digital preservation. *Journal of Digital Media Management*, 6 (2), 1-9, 182-194.

Beagrie, N., Semple, N., Williams, P., & Wright, R. (2008). *Digital preservation policies study: part 1: final report October 2008.* Bristol: HEFCE. www.beagrie.com, 2008

Becker, C., & Reuber, A. (2011). Preservation decisions terms and conditions apply: challenges, misperceptions and lessons learned in preservation planning. In *Proceedings of the 11th Annual International ACM/IEEE Joint Conference on Digital Libraries (JCDL)*, Ottawa, pp. 67-76

Bishoff, L., & Smith, C. (2015). Managing digital collections survey results. *D-Lib Magazine*, 21 (3/4), 1-11.

Government Printers. (2017). *Copyright Amendment Bill*, No. 13B of 2017. Pretoria: Author.

Corrado, E.M., & Moulaison, H. L. (2014). *Digital preservation for libraries, archives, and museums*. Lanham, MD: Rowman and Littlefield Publishers

Council of Canadians Academies. (2015). *Leading in the digital world: Opportunities for Canada's memory institutions*. *The expert panel on memory institutions in the digital revolution*. Ottawa: Council of Canadian Academies

Davies, W. (2000). Understanding strategy. *Strategy and Leadership,* 28 (5), 25-30.

deWatteville, A., and Gilbert, L. (2000). *Advanced information and communication technology*. Oxford: Heinemann Educational Publishers.

Digital Preservation Coalition (2015). *Digital preservation handbook*. (2nd Ed.). http://dpconline.org/handbook5.

Dollar, C. M., & Ashley, L. J. (2014). *Assessing digital preservation capability using a maturity model process improvement approach.* . https://static1.squarespace.com

Echezona, R. I. (2009). Strategies for improving the management of special collections in federal and state university libraries in Nigeria. *Heartland Journal of Library and Information Science*, 3 (1 & 2), 105

Electronic Resource Preservation and Access Network (ERPANET). (2003). *Digital Preservation Policy Tool.* https://www.erpanet.org/guidance/docs/ERPANETPolicyTool.pdf

Enakrire, R. T., Chisita, C. T. and Tella, A. (2020). Partnership among librarians: Reflection on observations, interviews and research reports from three universities in Nigeria and Zimbabwe. *International Journal of Higher Education,* 9 (5), 341. Retrieved from http://ijhe.sciedupress.com,

Etim, .E. F., & Christopher, J. (2012). Visibility and accessibility of academic and research library in digital environment. *Paper presented at the Workshop on Academic Library Practice in the Digital Environment* organized by the NLA, Academic and Research Library Chapter held at University of Calabar, from 20 -23rdNovember, 2012.

Ezeani, C. N. & Ezema, I. J. (2009). Digital preservation of the cultural heritage of University of Nigeria, Nsukka: Issues and current status. *Paper presented at the 47th National Conference Annual General Meeting of the Nigerian Library Association* in Ibadan in 2009.

Gbaje, E. S. (2011). Digital preservation strategies: A case study of Nigerian national information centres. *International Federation of Library Associations and Institution*, 37, (3), 218-227. http://www.ifla.org/files/assets/hq/publications/ifla-journal/ifla-journal-37-3_2011.pdf

Gbaje, E. S., & Mohammed, M. F. (2017). Long-term accessibility and re-use of institutional repository contents of some selected academic institutions in Nigeria. *Paper presented at*

Satellite Meeting: Serials and other Continuing Resources Section and Acquisition and Collection Development held at European Solidarity Center, Gdańsk, Poland in 2017. http://library.ifla.org ›

Harake, S. B., & Hadagali, G. S. (2015). Continuing education programmes for library and information science professionals: An Indian scenario. *The Journal of Library and Information Management*. 3-4. DOI: 10.5958/2249-3182.2015.00012. https://www.researchgate.net/publication/313321919

Hedstrom, M. (1997). Digital preservation: A time bomb for digital libraries. *Computers and the Humanities,* 31, 189-202.

Ifegah, G. I. (2011). Nigerian universities libraries: Current situation, needed improvement and how marketing might help. *Library student Journal*. htpp://www.library studentjournal.org/indnex.plip/isj/articles/view/229/307topdivin 18-03-2012

Ifijeh, G. (2014). Adoption of digital preservation methods for theses in Nigerian academic libraries: Applications and implications. *The Journal of Academic Librarianship,* 40, 401-403

Ishola, B. C. (2014). Funding problems in Nigerian university libraries: Fee-based library and information services to the rescue, focus on pricing policy. *Library Philosophy and Practice.* 5. http://digitalcommons.unl.edu/libphilprac/1176

Inyang, N. A. & Igwesi, W. H. (2015). Funding and library resources in government-owned university libraries in Nigeria. *Cloud Publications International Journal of Advanced Library and Information Science*, 3 (1), 137. DOI: https://doi.org/10.23953/cloud.ijalis.242

Jimada, A. (2015). *Preservation of digital information resources in the federal university libraries in the North-Western states of Nigeria.* A thesis submitted to the postgraduate school, Ahmadu Bello University, Zaria. Retrieved from

Kavishe, G. F., & Dulle, F. (2016). Preservation skills and strategies of electronic information resources in digital era: Case of University of Kwazulu-Natal libraries. *Library Philosophy and Practice*. 2. http://digitalcommons.unl.edu/libphilprac/1451

Kirchhoff, A. (2009). *Expanding the preservation network: Lessons from Portico*. http://muse.jhu.edu/login?auth=0&type=summary&url=/journals/library_trends/v057/57.3.kirchhoff.html

Kumbar, B. D., Kotabagi, A. G., & Lamani, M. B. (2014). Use pattern of electronic information resources by the research scholars of science departments, Karnatak University, Dharwad. *International Journal of Digital Library Services,* 4 (3), 111. www.ijodls.ng

Lewis, D. W. (2007). A strategy for academic libraries in the first quarter of the 21st century. *College and Research Libraries,* 68 (5), 418-434.

Li,Y. & Banach, M. (2011). Institutional repositories and digital preservation: Assessing current practices at research libraries. *D-Lib Magazine,* 17 (5 & 6), 12-23. www.dlib.org/dlib/may11/yuanli/05yuanli.html

Madu, A. U., Vandi, I. and Chagwa, S. M. (2018). Availability and utilization of ICT for information retrieval by undergraduate students in Ramat Library, University of Maiduguri: A case study. *Journal of Humanities and Social Science,* 23 (5), 35. DOI: 10.9790/0837-2305023542. Retrieved from www.iosrjournals.org,

Majid, S. (2004). Continuing professional development activities organized by library and information study programs in South-East Asia. *Journal of Education for Library and Information Science,* 45 (1), 58-70.

Maemura, E., Moles, N., & Becker, C. (2015). A survey of organizational assessment frameworks in digital preservation. *Paper presented at the 12th International Conference on Digital Preservation (IPRES),* Chapel Hill, NC, USA

Maesaroh, I., & Genoni, P. (2010). An investigation of the continuing professional development practices of Indonesian academic libraries. *Library Management*, 31(8/9), 621-634

Mannheimer, S., & Cote, C. (2017). Cultivate, assess, advocate, implement, and sustain: A five-point plan for successful digital preservation collaborations. *Digital Library Perspectives*, 33 (2), 100-116.

Marinkovich, J., Velásquez, M., Córdova, A., & Cid, C. (2016). Academic Literacy and genres in university learning communities. *Ilha do Desterro*, 69 (3) (2016), 95-113. https://dx.doi.org/10.5007/2175-8026.2016v69n3p95

Masenya, T. M. (2018). *A framework for preservation of digital resources in academic libraries in South Africa.* PhD thesis, University of South-Africa, Pretoria.

Masenya, T. M & P, Ngulube. (2020). Factors that influence digital preservation sustainability in academic libraries in South-Africa. *South African Journal of Libraries and Information Science*, 86, 1-14. http://dx.doi.org/10.7553/86-1-1860

Matthews, G. (2009). Preservation training. Brine. A. (Ed.). *Handbook of library training, practice and development*. England: Ashgate.

Musa, S. & Safiyanu, S. S. (2015). Digital preservation in Nigeria universities libraries: A comparison between University of Nigeria Nsukka and Ahmadu Bello University, Zaria. *International Journal of Educational and Pedagogical Sciences,* 9 (10), 3628-3629

Noonan, D. (2014). Digital preservation policy framework: A case study. *Educause Review*, 1-23.

Nwachukwu, V. N., Asiegbu, F. N. & Ogwo, Uzoamaka (2014). Academic libraries and ICT development in Nigeria's tertiary educational system. *International Journal of Advanced Research,* 2 (5), 118. http://www.journalijar.com

Nworie, J. C. (2019). Assessment of current preservation strategies of digital materials in university libraries in South-East, Nigeria. *Library Philosophy and Practice.* 1-6. https://digitalcommons.unl.edu/libphilprac/2272

Nworgu, B. G. (2015). *Educational research: Basic issues and methodology*. (3rd Ed.). Nusukka: University Trust Publishers

Odusanya, A. K., & Osinulu, L. F. (2004). The impact of ETF funding on academic libraries. A case study approach. *African Journal of Library, Archives and Information Science*. 14 (2), 185-192.

Okoh, M. I., & Sambo, A. S. (2014). Awareness of digital preservation strategies by librarians in Nigeria. *Journal of Applied Information Science and Technology,* 7 (2), 11-15

Okore, A. M., Asogwa, C. N., and Eke, H. N. (2009). Online resources and web research. In C. O. Onekwu; M. O. Okoye, and C. N. Ezeani (Eds.). *Introduction to the use of the library and study skills.* Nsukka.: The library Department, University of Nigeria, Nsukka (105-117).

Okoye, M. O., & Uguwuanyi, C. F. (2012). Management of electronic resources by cataloguers in Nigerian federal university libraries. *Library Philosophy and Practice*. http://unllib.unl.edu/LPP/

Olurotimi, O. S. (2015). Alternative funding of academic libraries in Nigeria: Case studies of Hezekiah Oluwasanmi Library, Obafemi Awolowo University, Ile Ife and Wusto Library, Wesley University of Science and Technology, Ondo. *Global Advanced Research*

Journal of Educational Research and Review, 4 (2), 22. Retrieved from http://garj.org/garjerr/index.htm

Oyewumi, O. O., Alegbeleye, G. O. and Onifade, F. N. (2015). Information communication technology (ICT) and its effect on newspaper utilisation in university libraries in Nigeria. IFLA WLIC 2015. Retrieved from http://creativecommons.org/licenses/by/3.0/

Palmer, W. (2014). *Scalable preservation environments: The nuts and bolts of digital preservation software tools*. http://blogs.bl.uk/collectioncare/2014/01/the-nuts-and-bolts-of-digital-preservation-software-tools.html

Park, E. G., & Richard, M. (2011). Metadata assessment in e-theses and dissertations of Canadian institutional repositories. *The Electronic Library,* 394. www.emeraldinsight.com/0264-0473.htm

Perry, S. R. (2014). Digitisation and digital preservation: A review of the literature. *SLIS Student Research Journal,* 4 (1), 1-12.

Ramaiah, C. K., & Moorthy, A. L. (2002). The impact of continuing education programmes on library and information science professionals. *Library Review,* 51 (1), 24-31.

Rinehart, A. K., Prud'homme, P., and Huot, A. R. (2014). Overwhelmed to action: Digital preservation challenges at the under-resourced institution. *Emerald,* 30 (1), 28–42.

Saka, K. A., Babalola, G. A., Ahmed, A. O., & Mohammed, A. A. (2010). Influence of preservation techniques and access to digital resources on research outputs of academic staff in federal university libraries in Northern Nigeria. https://scholar.google.com

Saka, K. A., Oyedum, G. U., & Song, S. I. (2016). Influence of continuing professional development and skills acquisition on librarians' performance in two state capitals in Northern Nigeria. *Balkan Libraries Journal*, 4 (1), 1. https://www.balkanlibraries.org/jornal

Sambo, A. S., Urhefe, E. A., & Ejitagha, S. (2017). A survey of digital preservation challenges in Nigerian libraries: librarians' perspectives. *International Journal of Digital Curation,* 12 (1), 122. doi: 10.2218/ijdc.v12i1.426. http://dx.doi.org/10.2218/ijdc.v12i1.426,

Saminu, A. (2016). Digital preservation of information resources in academic libraries in Nigeria. *International Journal of Scientific and Engineering Research*, 7 (5), 810-813. http://www.ijser.org

Sanett, S. (2013). Archival digital preservation programs: Staffing, costs and policy. *Preservation, Digital Technology and Culture,* 42 (3), 137-149. Doi:10.1515/pdtc-2013-0019

Singh, H. (2012). Training and development: a prominent determinant for improving human resource productivity. *International Conference on Management and Education Innovation*. http://www.ipedr.com/vol37/053-ICMEI2012-E10061.

Skinner, K., & Halbert, M. (2009). The Meta-Archive Cooperative: A collaborative approach to distributed digital preservation. *Libr Trends,* 57 (3), 371–92

Swain, A. (2012). *Policy guidelines for the development and promotion of open access.* Paris: UNESCO.

Tella, A., Akinboro, E. and Hammed, S.T. (2012). The Perspective of LIS scholars/researchers on the impact of collaboration in LIS research in the digital age. *Paper Presented during the 50th NLA Conference,* Abuja.

Ugwu, C. & Ekere, J. N. (2010). Training needs of librarians for digital library project in university libraries in Nigeria: A case Study. Proceedings of Second Professional Summit on Information Science and Technology (PSIST) on Scholarly Communication and

Information: Mentoring, Mastery and Modernization held at NnamdiAzikiwe New Library Complex University of Nigeria, Nsukka, pp. 176–184.

Ukachi, N. B. (2018). Enhancing scholarly communication through institutional repositories: Salient issues and strategies by libraries in Nigeria. IFLA WLIC Kuala Lumpur

Uzohuo, A. U. (2017). Effect of ICT on librarians in Anambra State. Awka: Unpublished thesis. Nnamdi Azikiwe University. Awka.

Verheul, I. (2006). *Networking for digital preservation: Current practices in 15 national libraries*. Saur, Munchen: International federation of Library associations and Institutions

Wiche, H. I., & Tom-George, N. W. (2018). Community needs assessment of the University of Calabar Library. *International Journal of Scientific Research in Education,* 11 (5), 860-862. http://www.ijsre.com

Zaid, Y., Abioye, A. & Olatise, O. (2012) Training in cultural heritage preservation: The experience of heritage institutions in Nigeria. *World Library and Information Congress:* 78th IFLA General Conference and Assembly

Zarnitz, M. & Arning, U. (2019). Ten Years of Strategic Collaboration of Libraries in Digital Preservation. *Liber Quarterly*, 29 (1), 2 DOI: 10.18352/lq.10278. http://liberquarterly.eu/

APPENDIX A: SAMPLE DISTRIBUTION

S/N	INSTITUTION	FEDERAL	STATE	INSTITUTIONAL REPOSITORY NO/YES	NO OF LIBRARIANS
1	Michael Okpara University of Agriculture Umudike Abia State	√		√	7
2	Nnamdi Azikiwe Library, University of Nigeria Nsukka Enugu State	√		√	7
3	Festus Aghagbo Nwako Library UNIZIK, Awka Anambra State	√		√	6
4	Chukwuemeka Odumegwu Ojukwu University		√	√	5

	Library Igbariam Anambra State (COOU)				
5	Federal University of Technology Owerri, Imo State (FUTO)	√		√	20
6	Enugu State University of Science and Technology Library (ESUT)		√	√	5
7	Abia State University Library, Uturu		√	√	9
8	Imo State University Library Owerri		√	√	2
9	Federal University Ndufu Alike, Ikwo Ebonyi State (FUNAI)	√		√	4
10	Ebonyi State University Abakaliki, (EBSU)		√	√	3