

Full Length Research

# ICT competence and digital preservation practices of library personnel in selected Nigerian private universities

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The growing popularity of digital information resources has brought about a new dimension to preservation practices in libraries. However, libraries of many tertiary institutions in Nigeria do not have good digital preservation practices. The study therefore, investigated the influence of ICT Competence on Digital Preservation Practices in Private Universities in Ogun State, Nigeria. The study adopted the survey research design. The population for the study comprised 164 library personnel in all Private Universities in Ogun State. The total enumeration method was employed. A structured validated and reliable online questionnaire was used for data collection. The Cronbach's Alpha reliability coefficient for the constructs ranged from 0.70 to 0.93. A response rate of 98.8% was achieved. Results revealed that Information Communication Technology (ICT) Competence ( $F(1,159) = 198.007$ ,  $R^2 = .529$ ,  $P < 0.05$ ) has significant influence on Librarians digital preservation practices. Further, ICT competence components, basic ICT skills ( $\beta = 0.474$ ,  $R = 0.106$ ,  $T = 2.263$ ,  $P < 0.05$ ), Intermediate ICT skills ( $\beta = 1.134$ ,  $R = 0.340$ ,  $T = 7.230$ ,  $P < 0.05$ ), had a significant influence on digital preservation practices while advanced ICT skill had a positive weak significant influence ( $\beta = 0.333$ ,  $R = 0.140$ ,  $T = 3.058$ ,  $P > 0.05$ ) on Digital Preservation Practices of Private University Libraries Personnel in Ogun State, Nigeria. The level of digital preservation practice of librarians in private Universities in Ogun State, Nigeria was found to be high. ( $\bar{x} = 4.01$ ,  $SD = .531$ ). The study concluded that Information Communication Technology (ICT) Competence contributes to digital preservation practice in private University libraries in Ogun State, Nigeria. It recommended that the management of libraries put policies and programs in place to help sustain digital preservation practices.

**Keywords:** Digital preservation practices, ICT competencies, Librarians, Library personnel, Private university libraries

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## INTRODUCTION

Libraries all over the world are known for the critical role of preserving vital information and the systemic manner in which such information is made accessible to users and knowledge seekers on demand. Academic libraries serve as repository of knowledge in varied formats by organizing, disseminating and preserving knowledge for both present and future use. The task of

information preservation in libraries has over the years been carried out primarily in book and non-book formats, with book format been the dominant practice prior to the explosion of the digital age. The emergence of the digital era revolutionized information gathering, storage and dissemination patterns for libraries and other information based institutions. Digital or virtual information storage and dissemination facilitated by information communication technology (ICT) has in recent time

become the norm for most academic libraries especially in more advanced countries. With this development also came the challenge of digital preservation of library resources being that technology itself is not static.

Digital preservation is about a series of actions that need to be taken and managed to make sure there is continued access to digital materials for as long as is necessary. As long as is necessary could mean long term - into the indefinite future, or short-term - for a specific time limited business requirement. Digital preservation is about a series of actions that need to be taken and managed in a library to ensure there is continued access to digital materials for as long as it is necessary (Velmurugan, 2013), which could mean long term - into the indefinite future, or short-term - for a specific time limit. Olatokun (2008) posited that digital preservation is the processes of maintaining accessibility of digital objects over time; while American Libraries Association (ALA, 2007) maintained that digital preservation combines policies, strategies and actions that ensure access to digital content over time. Digital material refers to any material processed by a computer and includes both which is digitized as well as those resources that are 'born digital'. Digital materials include texts, databases, still and moving images, audio, graphics, software, and web pages, among a wide and growing range of formats. They are frequently ephemeral, and require purposeful production, maintenance and management to be retained (Velmurugan, 2013). Problems of digital preservation are compounded by the obsolescence of computer equipment, software, and storage media (Li & Banach, 2011).

Digital preservation remains one of the most critical challenges facing scholarly communities today. Anyaoku, Echedom and Baro (2019) observed that libraries are struggling with how to preserve the scholarly and cultural record now that such information is increasingly being produced in digital formats. From e-journals, e-books, electronic theses and dissertations to e-mails, blogs and more, electronic contents are proliferating fast, and libraries worldwide are racing to preserve information for the next generations before technology obsolescence, or even data loss, creep in (Li & Banach, 2011). Digital information is fragile and faces many threats including technological obsolescence and the deterioration of digital storage media (Li & Banach, 2011). Jackson (2011) stated that, "the rate of change in computing technologies is such that information can be rendered inaccessible within a decade" (p. 2), unless efforts are intensified at preserving and ensuring that such vital information is accessible for as long as necessary. Preservation has taken a new dimension with modern electronic technology. Digitization of important materials that may deteriorate because of age and condition is being carried out by information professionals who after identification of materials to be digitized, clears copyright

issues, digitizes, provides metadata, and acquires software to make such resources available when needed in future, and to maintain it in digital form (Fabunmi, Ayodeji, Paris & Fabunmi, 2019). After collections or individual items are digitized, the next stage is digital preservation, which involves all the activities undertaken to ensure that digital information is maintained for as long as it is needed (Fabunmi et al., 2019).

Digital preservation has been a significant problem facing libraries in Africa. The process applies to "born digital" material (i.e., created electronically), and to "digital surrogates" (i.e., created in non-digital form but subsequently converted to digital form. With literally every bit of information now being digitally processed and stored, our computer-based society is now faced with the challenge of how best to preserve and efficiently access these vast amounts of digital data well into the future. While born digital content is emerging in all areas, ways to preserve it are far behind, most especially for universities libraries in Africa (Anyaku, Echedom & Baro, 2018). The report of Bekele (2016) study which examined the status of digital preservation practices in Botswana, Ethiopia, and South Africa showed that there was growing consciousness of the need to implement digital preservation programs. The research exposed the fact that 65% of the institutions surveyed were aware of the risks associated with inadequate preservation, but only 35% had developed in-house guidelines or policies on how digital files were to be managed. Ezema (2013) attested to this by pointing out that, Africa is yet to completely embrace new information technologies, although recent developments indicate that researchers in the continent are accepting new technology in their day-to-day activities. Ezema further noted that, first; research activities are very low in Africa. Second, it is also true that much of the research publications generated in Africa are highly under-utilized in the global scholarly community. Reason for this is apparently because scholarly publications from the continent lack global visibility (Ezema, 2013).

Digital preservation is also a significant problem facing libraries in Nigeria. Libraries are struggling to preserve the scholarly records in digital formats due to inadequate funds to provide needed infrastructure for such purpose. In Nigeria, digitization started in 2004 at the Ahmadu Bello University, Zaria. Librarians began by scanning theses and dissertations (Gbaje, 2016). Gbaje also noted that in 2016, a pilot project for institutional repositories was launched with the use of DSpace. This prompted the universities of Lagos, Ibadan, Ife, and University of Nigeria, Nsukka to begin digitization projects. The National Library of Nigeria also set up a digital project in 2005. In 2008, the University of Nigeria embarked on a digitization project with the aim of preserving their intellectual property, including theses, conference proceedings, seminar papers, colloquia, research

publications, and inaugural lectures (Gbaje, 2016). As at 2008, the library had scanned 23,477 theses, 8,106 publications, 3,121 proposals and seminar papers and 13,130 files; all uploaded and files have been linked (Gbaje, 2016). It is worthy to note that no library can embark on digitization projects without considering digital preservation. Thus far libraries here have used traditional strategies: technology emulation, information migration, encapsulation, and refreshing data. But such approaches alone do not constitute preservation programs (Kari & Baro, 2016). According to Jain and Mnjama (2016), preservation of digital records includes the following problems and challenges; lack of knowledge, shortage of adequately trained personnel to handle digital records, insufficient funding for human and physical resources required to establish and maintain the programs and the technological obsolescence and fragility of storage media. It is known that the long-term digital preservation of resources in the archives is the preferred strategy for curbing the decay of materials and addressing the problems of hardware, software obsolescence, and backup issues (Sambo, Urhefe & Ejitagha, 2017).

In addition to the impediments already identified, there is also the problem of the high level information communication technology (ICT) competence required. Digital information is fragile, and its preservation requires high handler competence because no library can effectively deploy digital information without a competent workforce and reliable preservative tools (Li & Banach, 2011). Competence is viewed as demonstrating the knowledge, skills, experience, and attributes necessary to carry out a defined function effectively. It is the acquisition of knowledge, skills, and abilities at a level of expertise sufficient to be able to perform appropriately a given task in a workplace (Ojiegbe, 2020). ICT competencies of library staff could therefore be viewed to be those relevant skills and knowledge to be acquired by those working in the library to be able to fully exploit information search, retrieval, and deliver using electronic format (Ojiegbe, 2020). Itsekori and James (2012) underscored that the evolving nature of technologies, globalization, and digitization, as well as information explosion of today information society meant that library professionals have to keep abreast with the latest technology advancement as well as their applications to library operation. Competence in ICT skills is therefore imperative such that, it now has an enduring impact on career development of library professionals to the point that it has become crucial for library and information science professionals to acquire ICT skills and be more competitive in the face of competition with other professionals. Without adequate ICT skills, librarians would not be able to cope with information explosion of today information society (Oyedokun, Oyewumi, Akanbi & Laaro, 2018). However, competence in ICT skills offer library professionals opportunities to take advantage of

Information and Communication Technology facilities to advance in their efforts in making library clientele connected to information resources in the cloud, by utilizing computer and its associative gadgets (Ademodi & Adepoju, 2019; Wada, 2014).

Part of the challenges facing digital library projects in African countries, including Nigeria is the readiness of the university libraries in terms of skills and knowledge to implement the digital and electronic library services. Rosenberg (2016) noted that skills in e-resources management, e-services development, full text digitization and teaching skills are lacking in African university libraries. Other challenges regarding funding, IT infrastructure, Internet connectivity, lack of commitment from staff and or/ management and the availability of African generated content to put into the digital collections and IRs are as well prevalent. Many donors like UNESCO, FAO, Andrew F. Mellon Foundation, Carnegie Foundation, and the AAU (Association of African Universities) have provided support in the training of librarians to implement digital libraries projects, while some universities have made reasonable efforts, others still lag behind. Some universities libraries have established dedicated IT units to address the problem of lack of IT skills among librarians, however, vendor training to ensure competence has in some cases posed as impediments where integrated library systems have been implemented. Some government own universities in Nigeria were identified earlier, where digital and electronic library services were implemented have struggled to render efficient services to clients due to incompetent workforce. Competency domain model expresses the hierarchical progress of ICT knowledge acquisition in a top-down order signifying the simplest starting point to the complex and wider areas of computing. It emphasizes that librarians need to first have basic knowledge on personal computer to have an understanding about how computer systems can be applied to library activities (Ibrahim, 2015). By extension, librarians can progress into acquiring knowledge in the field of internet operations and usage. By practice, the knowledge of computer and internet would provide a ground for appreciation of networking, which encompasses the scenario of connectivity, sharing and cooperation using both digital and analogue technologies (Ibrahim, 2015).

Digital preservation is very important within any given library, but it is becoming more and more challenging of the duration over which information is needed to be preserved (Paper, 2018). This means that digital information will only survive for the period not beyond the supported life of the application device used to preserve them. Moloi and Mutula (2017) identified that information centers in the third world countries are faced with issues in preserving digital information. Production of complex

electronic information resources, rapid changes in technologies as well as lack of expertise in the personnel preserving digital information are among the challenges that have made digital information preservation a difficult task. As digital information continues to develop exponentially, libraries are faced with the challenge of sustaining adequate skilled staff in digital information preservation issues. This challenge is in fact increasing because most of the libraries in developing countries do not have active management and intervention (Gbaje, 2011). Poor preservation of digital information is bound to be the outcome in information gaps. Therefore, libraries and other information centers must adopt long term preservation strategies to preserve digital information. There is little documented evidence on preparedness of libraries in managing challenges of digital information preservation. Hence, this study examines the influence of ICT competence on digital preservation practices of library personnel's in Nigerian private universities.

## RESEARCH QUESTIONS

The following research questions guided the study:

1. What is the level of ICT competencies among library personnel in selected Nigerian private universities libraries?
2. What is the level of digital preservation practices in selected Nigerian private universities' libraries?
3. What are the challenges impeding effective digital preservation practices by library personnel on in Nigerian private universities' libraries?

## HYPOTHESIS

The following hypothesis was tested in the study at 0.05 level of significance:

H<sub>0</sub>1: ICT competence will not significantly predict digital preservation practices in Nigerian private universities

## LITERATURE REVIEW

### Digital preservation

The American Library Association explained digital preservation as a combination of policies, strategies, and actions to ensure that digital objects remain authentic and accessible to users and systems over a long period of time, regardless of the challenges of component and management failures (ALA, 2018). With the advent of digital technologies, digital preservation is becoming a necessity for academic institutions. However, as digital technologies become more sophisticated, it is likely that

they are going to trigger more changes in the way academic institutions practice and deliver on their mandate (Masenya & Ngulube, 2019). These changes provide compelling reasons for academic libraries to rethink their structures, operations, and services to remain relevant in this digital era. Ruusalepp and Dobrev (2013) defined digital preservation as a complex activity not only because of the increasing complexity of digital objects, but also because the context of use needs to be recreated. This means sustaining not only the data, but also any specific software that was used to work with the data and the technological infrastructure. It is therefore important not only to preserve the record itself, but also the hardware and software it was created on and designed to be used with. The selected preservation strategy must therefore allow the preserved entities to continue to be readable and usable, regardless of any technological changes to the underlying hardware or software environments (Ruusalepp & Dobrev 2013).

Libraries for decades managed information in various analogue formats (hard copy) including parchment, paper, videotape, and photographic film, and now need to preserve digital resources for as long as they are needed. The need for digital preservation can be considered from the benefits and challenges of digital information resources. Libraries can preserve information digitally in order to ensure continuous rendering of better services and the attendant benefits. Again, libraries can also preserve them to guard against threat to digital resources and services. Digital information has a lot of benefits to libraries and users. Hence, it is important for libraries to give adequate consideration for the preservation of the resources (Okoh & Saliu, 2014). The rationale for a digital preservation of information resources in academic environment has been underscored by (Ahrams, 2015) when he explained that digital information resources create enabling environment for scholarly publishing and make research productivity of a particular institution more visible globally. It therefore adds value to credibility of a university in terms of its intellectual products. Furthermore, Oyeniyi (2015) opined that libraries and archives should preserve their materials to ensure their accessibility and longevity, to foster research, and to prevent spending on replacement costs of old materials.

In preserving digital materials in the library, certain strategies are being put into consideration. UNESCO (2013), in adopting strategies for preserving digital heritage stated that, strategies and policies to preserve the digital heritage can be developed, considering the level of urgency, local circumstances, available means and future projections. The cooperation of creators, holders of copyright and related rights, and relevant institutions in setting common standards and compatibilities, and resource sharing, will help facilitate it. According to Dolan-Mescal, Farewell, Howard, Rozler and Smith (2014), long-term digital preservation is not

just about tomorrow; it is also about formulating a plan for today that will make your digital files more organized, efficient, professional, secure and useful. And this, in turn, will only make collections, archives and institutions stronger. Murphy (2018) lamented that libraries, publishers, and researchers have accumulated vast collections of data, text, images and other forms of digital materials and these collections are of immeasurable value to research and learning, both now and in future. While Gbaje (2012) posited that digital preservation, strategy is a method for keeping stored digital objects permanently accessible for long-term use. He also pointed out that strategy is a crucial part of managing the risk associated with rapid hardware and software obsolescence. In 2006, the Online Computer Library Center developed a four-point strategy for the long-term preservation of digital objects. They include: Determining the appropriate metadata needed for each object type and how it is associated with the objects, providing access to the contents, assessing the risks for loss of content posed by technology variables such as commonly used proprietary file formats and software applications and also evaluating the digital content objects to determine what type and degree of format conversion or other preservation actions should be applied.

### **Digital preservation practice in libraries**

Library is a place where anyone can create, access, utilize and share information, knowledge, enabling individuals, communities, and people to achieve their full potentials in promoting sustainable development and improving quality of life (Akidi & Onyenachi 2017). It is a collection of books and non-book materials organized and housed in a place for use, with one or more persons trained to assist in the use of the collection (Nwaigwe & Onwuama, 2017). The holdings of libraries are the priceless heritage of mankind as they preserve facts, ideas, thoughts, accomplishments, and evidence of human development in multifarious areas, ages, and directions. The past records constitute a natural resource and are indispensable to the present and future

generations; therefore, any loss to such materials is simply irreplaceable (Nworie, 2019). Many libraries are made up of both print and digital collections, services, and infrastructure to support lifelong learning, research, scholarly communication as well as preservation and conservation of the recorded knowledge. Digital materials make up digital libraries. These materials are the bedrock upon which digital libraries thrive in the provision of information and recorded knowledge which management, lecturers and students of academic institutions need in running the affairs of the institutions (Nworie, 2019). As more information resources are digitized or born digital, the question of how to keep digital objects accessible for future generation becomes increasingly pressing. Digital preservation practices in academic libraries presents digital libraries with both technical and service challenges. The strategy required to preserve digital objects in a readable format test the technological capabilities of digital libraries in additions to presenting complex service challenges. Institutions must make decisions about which documents to preserve and if, or how to preserve the context of the document. The decisions made today will directly impact upon digital libraries' ability to meet future user needs. The major focus should be the digital library services that will satisfy user expectations and resolve their information needs for generations to come including how to determine the stakeholders, as well as the legal issues affecting digital preservation initiatives (Samiru, 2016). Chinwe and Ifeayi (2019) examined digital preservation of the cultural heritage of university of Nigeria, Nsukka using structured questionnaires to collect data from librarians and technical assistants at the university library. The result revealed that librarians involved in the project are yet to fully possess the skills needed for the job; the paper recommended more training for library staff and procurement of more state of the art equipment. Furthermore, Ibinaiye (2012) investigated the challenges and prospects of digitization of library resources in Nigerian universities using the experience of Kashim Ibrahim library ABU Zaria as a case. The research method adopted was a descriptive survey; the study revealed that thesis, dissertation, and seminar papers were the only library resources digitized at the time the study was carried out. It therefore recommended training of librarians and additional staff to handle the digitization process of the institution.

## **METHODOLOGY**

The study adopted the survey research approach. The population comprised 164 library personnel in private universities in Ogun State, South-west, Nigeria, being the state with the highest number of private universities (11) in the country. One hundred and sixty-two (162) copies of research instrument were validated for analysis, resulting in 98.8% response rate. The Cronbach's alpha value from the reliability analysis of variables included in the study was 0.936. Table 1 presents a list of private universities in the state together with their number of library personnel.

**Table 1.** List of selected Nigerian private universities

S/N	Private Universities	Professionals	Para-Professionals	Total
1	Babcock University	12	40	52
2	Bell University	7	8	15
3	Chris-land University	3	4	7
4	Christopher University	2	3	5
5	Covenant University	17	35	52
6	Crawford University	5	4	9
7	Crescent University	3	5	8
8	Hallmark University	2	3	5
9	Macpherson University	1	2	3
10	Mountain top University	2	4	6
11	Southwestern University	1	1	2
<b>Total</b>		<b>55</b>	<b>109</b>	<b>164</b>

Source: **Institution's Library, 2021**

Data were collected via online administration of a pre-tested questionnaire by the researcher, and analyzed through descriptive statistical tools of frequency, percentages distribution and mean, while hypothesis was tested using linear regression. Ethical approval for the study was obtained from Babcock University Health Research Ethics Committee (BUHREC).

### Data Analysis and Discussion of the Findings

**RQ1:** What is the level of ICT competencies among library personnel in selected Nigerian private universities libraries?

**Table 2.** Level of ICT competence among library personnel

Items	VHL F (%)	HL F (%)	ML F (%)	LL F (%)	VLL F (%)	Mean $\bar{x}$	SD
<b>How competent are you in the following skills?</b>							
<b>A. Basic ICT Skills</b>							<b>4.73</b>
1 Ability to create and manage files and folders in my computer	55(33.9)	99(61.2)	8(4.9)	-	-	4.94	.742
2 Ability to edit a document (Bold, italicize and underline, change font colour, cut, copy and paste text or graphics)	103(63.6)	59(36.4)	-	-	-	4.99	.794
3 Ability to type using computer systems	155(95.7)	7(4.3)	-	-	-	5.00	.768
4 Ability to Print documents	108(66.6)	50(30.8)	4(2.4)	-	-	4.96	.826
5 Ability to use and create PDF reader.	101(62.3)	45(27.7)	16(9.7)	-	-	4.89	.882
6 Ability to use word processors like MS Word, etc.	99(61.1)	51(31.5)	9(5.5)	3(1.8)	-	4.78	.879
7 Ability to access my emails	109(67.3)	53(32.7)	-	-	-	5.00	.806
8 Saving, retrieving, downloading and viewing documents and files	111(65.5)	51(31.5)	-	-	-	5.00	.953
<b>B. Intermediate ICT skills</b>							<b>4.08</b>
9 Ability to save files into my Google drive, sky drive, iCloud, flash drive or CDs.	39(24.0)	105(64.8)	10(6.3)	8(4.9)	-	3.40	.743
10 Ability to use shortcut icons	37(22.8)	99(61.1)	16(9.7)	10(6.1)	-	4.10	.722

**Continuation of Table 2**

1	Ability to create, add a new slide	66(40.7)	84(51.8)	12(7.4)	-	-	4.58	.758
1	and change slide design							
1	Ability to compose, attach file to	94(58.0)	59(36.4)	9(5.5)	-	-	4.46	.781
2	email and send e-mail messages							
1	Ability to use PowerPoint for my	55(33.9)	103(63.5)	4(2.4)	-	-	4.55	.832
3	presentations							
1	Ability to Protect my computer from	91(56.1)	64(39.5)	7(4.3)	-	-	43.33	.808
4	virus							
1	Ability to use internet explorer and	73(45.0)	85(52.4)	6(3.7)	-	-	4.31	.810
5	other web browsers							
1	Ability to download a file from the	51(31.4)	87(53.7)	8(4.9)	10(6.1)	6(3.7)	2.96	.904
6	internet							
1	Ability to use an online search	95(58.6)	67(41.3)	-	-	-	5.00	.935
7	engine e.g. Google							
1	Online book selection/acquisition	39(24.0)	66(40.7)	23(14.1)	16(9.8)	18(11.1)	2.89	.881
8								
	<b>C. Advanced ICT skills</b>						<b>3.11</b>	<b>.660</b>
1	Ability to install and uninstall							
9	software applications on computer	30(18.5)	80(49.3)	15(9.2)	19(11.7)	18(11.1)	3.47	.671
	systems							
2	Ability to use spreadsheet software	10(6.1)	55(33.9)	59(36.6)	20(12.3)	18(11.1)	3.38	.749
0	e.g. excel							
2	Ability to use database software	12(7.4)	59(36.4)	61(37.6)	23(14.1)	7(4.3)	3.34	.742
1	e.g. Access							
2	Ability to use Microsoft Publisher	17(10.4)	31(19.1)	99(61.1)	-	15(9.2)	1.59	.794
2								
2	Ability to use graphic software e.g.	-	51(31.5)	80(49.4)	31(19.1)	-	2.32	.768
3	Photoshop							
2	Ability to perform online catalogue	-	60(37.0)	89(54.9)	13(8.0)	-	2.31	.826
4								
2	Ability to develop application using	-	-	66(40.7)	86(53.0)	10(6.1)	1.22	.882
5	programming language e.g. Java							
2	Ability to network computing	-	39(24.0)	89(54.9)	16(9.8)	18(11.1)	2.89	.879
6	devices							
2	Ability to automate library services	45(27.7)	79(48.7)	14(8.6)	20(12.3)	4(2.5)	3.13	.806
7								
2	Ability to manage content on the	-	61(37.6)	88(54.3)	13(8.0)	-	3.06	.953
8	library website							
2	Ability to create and follow online	17(10.5)	115(70.9)	13(8.0)	17(10.5)	-	3.13	.808
9	discussion							
3	Ability to create and publish	-	98(60.5)	40(24.5)	11(6.8)	13(8.0)	3.10	.810
0	content online							
<b>Grand Mean</b>							<b>4.11</b>	<b>.659</b>

(Field survey, 2021)

The above result indicate that level of ICT competence among library personnel in Nigerian private university libraries is high ( $\bar{x}=4.11$ ,  $SD=.659$ ). The level of basic ICT skills is high ( $\bar{x}=4.73$ ,  $SD=.799$ ), intermediate ICT skills is high ( $\bar{x}=4.08$ ,  $SD=.711$ ), while they possessed advanced ICT skill to a moderate level ( $\bar{x}=3.11$ ,  $SD=.660$ ).

**RQ2:** What is the level of digital preservation practices in selected Nigerian private universities' libraries?

**Table 3.** Level of digital preservation practice

Items	VHL F (%)	HL F (%)	ML F (%)	LL F (%)	VLL F (%)	Mea n $\bar{x}$	SD
<b>Policy</b>						<b>4.08</b>	<b>.736</b>
My institution implements our digitize preservation policy	35(21.5)	91(56.2)	33(20.4)	3(1.9)	-	4.38	.672
My institution has sustainable funding policy for digital preservation	30(18.5)	93(54.4)	29(17.9)	10(6.2)	-	4.31	.720
My institution has a policy on recruitment of competent personnel for digital preservation practices	25(15.4)	101(62.5)	27(16.6)	9(5.5)	-	4.25	.722
My institution has policy on software/IR used for digital preservation	11(6.8)	103(63.6)	31(19.1)	17(10.5)	-	4.17	.805
My institution has a policy for contents to be digitally preserved	51(31.5)	97(59.9)	10(6.2)	4(2.4)	-	4.07	.766
<b>Strategy</b>							
<b>Information Migration</b>						<b>4.51</b>	<b>.717</b>
I can transfer digital scholarly information from one generation of computer to another	55(33.9)	101(62.3)	6(3.7)	-	-	4.89	.805
I can copy content from digital scholarly materials from one generation of computer to another	60(37.1)	102(62.9)	-	-	-	4.99	.766
I can convert digital object from one generation of computer technology to another	31(19.1)	111(68.5)	9(5.5)	11(6.8)	-	4.66	.740
<b>Encapsulation</b>						<b>2.03</b>	<b>.559</b>
I can overcome the problems of technological obsolescence of file formats	13(8.0)	51(31.5)	61(37.6)	31(19.1)	6(3.7)	2.59	.589
I can access digital object on computer platforms	-	61(37.6)	39(21.0)	45(27.7)	17(10.5)	2.48	.607
I can create original application on computer platforms	-	13(8.0)	51(31.5)	88(54.2)	10(7.2)	2.18	.619
<b>Technology Emulation</b>						<b>2.13</b>	<b>.533</b>
I can preserve digital original application programs	11(6.8)	57(35.2)	39(24.0)	55(33.9)	-	3.43	.591
I can access original data on a new platform	-	59(36.9)	71(43.8)	13(8.0)	19(11.3)	3.39	.617
I can develop a new hardware/software that can mimic the old technology that was used in creating digital object	-	-	55(33.9)	71(43.8)	36(22.2)	1.38	.627
<b>Refreshing</b>						<b>3.91</b>	<b>.551</b>
I can periodically transfer digital objects from one physical medium to another	79(48.7)	71(43.8)	12(7.4)	-	-	4.83	.591
I can copy digital information into new media before the old media becomes so obsolete that the data cannot be accessed	61(37.6)	86(53.0)	11(6.8)	-	-	4.79	.617
I can preserve the integrity of digital information	-	81(50.0)	55(33.9)	16(9.9)	10(6.2)	3.38	.627
<b>Technology Preservation</b>						<b>4.09</b>	<b>.713</b>
I can preserve an original application program, operating system software, and hardware platform	75(46.3)	87(53.7)	-	-	-	4.99	.743
I can preserve digital objects	66(40.7)	81(50.0)	11(6.8)	4(2.5)	-	4.69	.722



**Continuation of Table 3**

I can preserve access tools to digital objects	-	-	75(46.3)	69(42.6)	18(11.1)	2.28	.758
<b>Activities</b>						<b>4.98</b>	<b>.669</b>
I can identify contents for preservation	79(48.8)	83(51.3)	-	-	-	5.00	.671
I can provide metadata for publication	77(47.5)	81(50.0)	4(2.5)	-	-	4.98	.749
I can work on copyright issues and other intellectual property for the content in institutional repositories	57(35.2)	105(64.8)	-	-	-	4.99	.742
I can protect preserved materials from unauthorized access	103(63.6)	59(36.4)	-	-	-	5.00	.794
I can protect preserved materials from loss or damage	105(64.8)	57(35.2)	-	-	-	5.00	.768
<b>Grand Mean</b>						<b>4.01</b>	<b>.531</b>

(Field survey 2021)

Results in the table depicts that the level of digital preservation practices of librarians in Nigerian private universities is also high ( $\bar{x}=4.01$ ,  $SD=.531$ ). Most universities possess and implement a digital preservation policy through strategic coordination and engagement in requisite digital preservation activities.

**RQ2:** What are the challenges impeding effective digital preservation practices by library personnel on in Nigerian private universities' libraries?

**Table 4.** Challenges of digital preservation practices in libraries

Items	Yes	No
	Freq-n(%)	Freq-n (%)
Inadequate ICT infrastructure	103(63.6)	59(36.4)
Lack of staff training/development	119(73.5)	43(26.5)
Limited budget for the library	147(90.7)	15(9.3)
Technophobia or lack of interest	99(61.1)	63(38.8)
Lack of finance to subscribe or purchase Data for browsing	109(67.3)	53(32.7)
Epileptic power supply	155(95.7)	7(4.3)
Work overload	139(85.8)	23(14.2)
Lack of policies	149(92.0)	13(8.0)
Lack of finance to purchase ICT devices	159(98.1)	3(1.9)

(Field Survey, 2021)

Participants' responses in the above table indicate that many challenges are militating against the development of digital preservation practices in Nigerian private universities.

**Table 5a.** Influence of ICT competence on digital preservation practices

<b>ANOVA</b>					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	16321.707	1	6311.601	181.007	.000 <sup>b</sup>
Residual	8190.601	159	32.241		
Total	24512.308	160			
<b>R=.554</b>	<b>R Square=.529</b>		<b>Adj. R Square=.516</b>		
<b>Coefficients</b>					
	Unstandardized Coefficients		Standardized T Coefficients	Sig.	
	B	Std. Error	Beta		
(Constant)	29.113	2.639		12.762	.000
ICT competence	1.249	.105	.660	11.859	.000
<b>Dependent Variable:</b> Digital preservation practices					

**Table 5b.** Multiple Linear Regression Testing Relative Influence of ICT Competence components on Digital preservation practices

Construct	B	R	T	Sig.
(Constant)	44.629		14.660	0.000
Basic ICT Skills	0.474	0.106	2.263	<b>0.024</b>
Intermediate ICT Skills	1.134	0.340	7.230	<b>0.000</b>
Advanced ICT Skills	0.333	0.140	3.058	<b>0.002</b>
Dependent Variable: <b>Digital preservation practices</b>				

The regression table (5a) indicates that ICT competence ( $F_{(1,159)} = 198.007$ ,  $R^2 = .529$ ,  $P < 0.05$ ) has significant influence on librarians digital preservation practices and thus can accounts for 52.9% ( $R^2 = .529$ ) of variation in digital preservation practices of librarians in Nigerian private universities. The relative influence of ICT competence components on digital preservation practices (table 5b) shows that Basic ICT skills had significant influence on digital preservation practices ( $\beta = 0.474$ ,  $R = 0.106$ ,  $T = 2.263$ ,  $P < 0.05$ ), Intermediate ICT skills also had significant influence on digital preservation practices ( $\beta = 1.134$ ,  $R = 0.340$ ,  $T = 7.230$ ,  $P < 0.05$ ), while Advanced ICT skill had a weak significant influence on digital preservation practices.

## Discussion of findings

Private university libraries in Nigeria have been found in this study to carry out digital preservation practices to a reasonable extent and at varying levels though with much improvement to be made. Findings indicate that all (11) private university libraries studied have a digital preservation policy, which is an indication that they all have digital repositories that serve the needs of users. E-Print and FEDORA preservation software was used by all libraries in the study, while some are using MyCore and DSpace preservation software in their institutions' repositories. Furthermore, some libraries' digital preservation policy is for long term, others medium term while others are short termed. This implies that libraries of all private universities in the study are equipped with different digital preservation resources, with majority on long term level of practice. The result is at variance with those of Jackson (2011), Anyaoku, Echedom and Baro, (2018) and Fabunmi, Ayodeji, Paris, and Fabunmi (2019) who in their respective studies observed that academic institution libraries in Africa and Nigeria specifically lacked basic infrastructures that can support digital preservation practices. However, there are indications that these studies arrived at such conclusion due to some challenges also notice in this study as impediments to the growth and development of digital preservation practices in university libraries of developing countries generally. These challenges though negatively impacting on

libraries and other sections of tertiary institutions in developing countries are not peculiar to academic institutions and their libraries alone. Problems such as inadequate ICT infrastructure, epileptic power supply, poor policy implementation, poverty and poor budget implementation are endemic in most developing countries, affecting many other dimensions of society rather than the academic institutions in these countries alone.

As seen in this study, the level of digital preservation practice of librarians in Nigerian private universities is high at 4.08 mean score on a 5-point scale. Also, the calculated value of  $F$ -statistics = 181.077 was significant at 0.000 alpha level, indicating that digital preservation practice is significant among respondents. The regression table showed further that the Adj. R Square=0.516 can account for up to 51.6% variation in the level of digital preservation practice among participants, which means that as hypothesized, the availability of information communication technology influenced digital preservation practices in private university libraries in Nigeria. This result is at variance with that of Ezema (2013) who attested that Africa is yet to completely embrace new information technologies in library practices, but corroborates that of Kari and Baro (2016) who found that more than half of the responding institutions in Africa rendered a long-term digital preservation with their repositories. Although the overall level of digital preservation practice is high in this study, it was observed from the result that the mean score for encapsulation ( $\bar{x} = 2.03$ ) and technology emulation ( $\bar{x} = 2.13$ ) were low, implying that improvement is needed in those areas. The result therefore implies that while other areas where the practice is high are sustained, librarians need to intensify their effort at improving in the area of encapsulation and technology emulation.

As observed earlier, competence in related ICT skills is necessary in library digital preservation practices. Results from this study reveal that the level of information communication technology (ICT) competence among library personnel of Nigerian private universities is high. Participants in the study indicated a very high level of competence in basic and intermediate ICT skills, but showed a moderate level of competence in advanced ICT skills, which implies a need for improvement in the area

of advanced ICT skills being that technology is on the move daily. Oyedokun, Oyewumi, Akanbi and Laaro (2018) observed that without adequate ICT skills, librarians would not be able to cope with information explosion of today information based society. They noted further that librarians who are not ICT compliant will find it difficult to fit into libraries where automated system of library practice is fully implemented. Their observation was in line with a previous study by Narasappa and Kumar (2016) who observed that the effectiveness of library services in this century largely depends upon Information and Communication Technology (ICT), such that libraries with necessary infrastructural capabilities can tap the ICT skills of their staff for development. However, staff deficiency in related ICT skills means such organization will have nothing to tap from. ICT competence of librarians can help maximize their productivity as well as add to the overall value delivery of the institution they serve. This underscores the need for librarians to continue improving in the area of information communication competence in order to remain competitive in their chosen profession.

## CONCLUSION

This study investigated the influence of ICT competence on digital preservation practices among library personnel in Nigerian private universities and found that digital preservation practices are carried out in Nigerian private university libraries and that all universities in the study have a policy guiding their digital preservation practices. Also, librarians in private universities exhibited a high level of competence in the areas of basic and intermediate ICT skills through which they performed various digital preservation tasks, even though a number of challenges were found to be militating against digital preservation practices. The study concludes that librarians ICT skills are high which encompasses basic and intermediate ICT skills, and that ICT competence has significant influence on librarians' digital preservation practices.

## RECOMMENDATION

Since findings from this study indicated that digital preservation practices are available in Nigerian private universities, it is therefore recommended that management of libraries in private universities put in place policies and programs that can help sustain the practices. Library personnel were found to be deficient in advanced ICT skills despite showing high level competence in basic and intermediate ICT skills. Therefore, the management of academic libraries in private universities should put in place programs

including training to improve library personnel's' ICT competencies.

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