



Preservation of Electronic Library Materials in Private University Libraries in Anambra State, Nigeria

¹Orakpor, Adaora Maudlin, ²Ibeh, Oluchi Bridget, ³Idoko, Sochima Albert, ⁴Okoye, chidimma Ogechukwu

¹Medical library,

²Department of Library and Information Science

⁴Faculty of law library,

Chukwuemeka Odumegwu Ojukwu University

ABSTRACT

This study investigates the preservation of electronic library materials in private university libraries in Anambra State, Nigeria, against the backdrop of rapid digital transformation and its attendant challenges. The research addresses critical gaps in preservation practices, storage media, techniques, and systemic obstacles faced by these institutions. Drawing on seminal work on digital resource sharing and subsequent studies (the study highlights the urgency of modernizing preservation strategies to combat technological obsolescence, bit rot, and institutional constraints. A descriptive survey design was employed, targeting 30 professional librarians across five private universities in Anambra State. Data collected via structured questionnaires revealed that libraries predominantly use diverse storage media, including e-books (mean = 3.42), dissertations (mean = 3.49), and digital archives (mean = 2.52). Preservation techniques such as format standardization (mean = 3.51) and secure backups (mean = 2.57) were widely adopted, while traditional methods like deacidification (mean = 1.32) were neglected. Key challenges included continuous migration demands (mean = 3.51), technological obsolescence (mean = 3.16), and inadequate policies (mean = 2.81). The findings align with UNESCO's (2003) preservation frameworks, emphasizing proactive strategies, legislative support, and institutional commitment. However, constraints like funding shortages, untrained personnel, and poor infrastructure hinder effective implementation. Recommendations include prioritizing infrastructure development, adopting hybrid preservation models, and enhancing staff training through workshops and policy reforms. This study contributes to the discourse on digital preservation in Nigerian academic libraries, underscoring the need for urgent, coordinated action to safeguard electronic collections. By addressing these challenges, private universities can serve as models for sustainable preservation practices, ensuring long-term access to digital scholarship in Nigeria's evolving information landscape.

ARTICLE INFO

Article History

Received: July, 2023

Received in revised form: August, 2023

Accepted: October, 2023

Published online: December, 2023

KEYWORDS

Electronic Preservation, Academic Libraries, Digital Resources, Anambra State, Knowledge Management, UNESCO

INTRODUCTION

The digital revolution has fundamentally transformed information preservation paradigms, rendering traditional methods obsolete while presenting both unprecedented opportunities and

existential challenges for academic libraries. As Orakpor (2006) compellingly argues in her seminal case study of Anambra State libraries, the transition to digital resource sharing demands nothing short of a complete overhaul of

Corresponding author: Orakpor, Adaora Maudlin

✉ am.orakpor@coou.edu.ng

Medical library, Chukwuemeka Odumegwu Ojukwu University.

© 2023. Faculty of Technology Education. ATBU Bauchi. All rights reserved



preservation strategies - a warning that remains startlingly relevant nearly two decades later.

This section presents a rigorous examination of electronic preservation, synthesizing global best practices with empirical evidence from Nigeria's evolving library landscape. Reitz's (2014) definition of electronic preservation as "the process of maintaining materials produced in electronic formats" fails to capture the existential urgency of this endeavor. Contemporary preservation must combat not just bit rot and format obsolescence (Brown, 2018), but also the alarming ephemerality of web-based resources which UNESCO (2003) estimates may disappear within 44 days to two years. Usiedi, Kalu, Nworie and Ibeh (2022) demonstrates how Nigerian libraries face compounded challenges due to infrastructural deficits and technological lag, making preservation efforts even more critical yet more difficult to implement effectively.

Beyond Traditional Models: New Preservation Imperatives

The legal deposit system - long the cornerstone of print preservation - proves woefully inadequate for digital materials. Ofodile and Orakpor's (2009) posit that evaluation of Ayamelum school libraries revealed, even basic digital infrastructure cannot be assumed in Nigerian educational institutions. Brindley's (2020) stark warning about generational knowledge loss becomes particularly salient in this context, demanding immediate action through:

1. **Proactive Preservation Frameworks:** Building on UNESCO's (2003) guidelines, Orakpor and Anyaoku's (2012) research on Web 2.0 utilization demonstrates how preservation must begin at the creation stage, particularly for born-digital materials.
2. **Comprehensive Legislative Support:** The call by Okeke-John et al. (2013) for libraries as change agents must extend to robust copyright and digital rights legislation that enables rather than hinders preservation.
3. **Sustainable Institutional Commitment:** Orakpor's (2020)

analysis of restructuring needs in Southeastern libraries highlights how preservation requires dedicated funding lines and staffing - a point reinforced by Yuan Li's (2021) global perspective.

The Nigerian Context: A Race Against Time

The establishment of electronic libraries in Nigerian universities (Chukwuma, 2014) represents progress but also new vulnerabilities. Orakpor and Omoruyi's (2022) COVID-era study reveals how pandemic pressures accelerated digital adoption while exposing preservation gaps. Private universities bear particular responsibility, as their typically better-resourced libraries (Okechukwu&Orakpor, 2017) must model best practices for:

1. **Hybrid Preservation Systems:** Combining digital and print backups as suggested in UNESCO's guidelines
2. **Capacity Building:** Addressing the skills gaps Orakpor et al. (2014) identified in electronic resource management
3. **Regional Collaboration:** Creating preservation networks across institutions, building on Okore, Njoku and Orakpor's (2013) findings about librarian attitudes

The preservation of electronic materials is not merely a technical challenge but an existential imperative for Nigerian academic libraries. As Orakpor's body of work (2006-2022) consistently demonstrates, without immediate, coordinated action combining policy reform, institutional commitment, and professional development, Nigeria risks losing not just individual resources but entire generations of digital scholarship. The time for incremental approaches has passed - what's needed now is nothing less than a national preservation emergency response, with academic libraries at its core. Future research must move beyond documenting challenges to piloting and evaluating localized preservation solutions that address Nigeria's unique technological and socioeconomic realities.

Corresponding author: Orakpor, Adaora Maudlin

✉ am.orakpor@coou.edu.ng

Medical library, Chukwuemeka Odumegwu Ojukwu University.

© 2023. Faculty of Technology Education. ATBU Bauchi. All rights reserved



STATEMENT OF THE PROBLEM

The preservation of electronic materials in academic libraries presents multifaceted challenges that threaten the long-term accessibility and integrity of digital collections. Unlike traditional print media, electronic materials are susceptible to inadvertent destruction of both their physical storage media and the information they contain. The inherent characteristics of electronic texts, including their ease of editing, manipulation, revision, and improvement, create vulnerabilities that compromise their permanence and authenticity, particularly when adequate security measures and preservation protocols are not implemented. This fragility of electronic media, as identified by Alegbeleye (2018), encompasses various forms of accidental damage and deterioration that can occur due to the nature of electronic resources themselves.

The problem of technological obsolescence presents an additional and inevitable challenge to electronic preservation efforts. The continuous evolution of electronic media and the corresponding changes in equipment and access technologies create significant barriers to information retrieval over time. The historical progression from 8-inch floppy disks to 5.25-inch floppies, 3-inch diskettes, flash drives, CDs, CD-ROMs, VCDs, DVDs, and external hard disks illustrates the rapid obsolescence of storage technologies. This technological evolution results in compatibility issues, as contemporary systems often lack the capability to access older storage formats, potentially rendering valuable information inaccessible.

Furthermore, the absence of consistent preservation policies across academic institutions exacerbates these challenges. Research by Akande (2020) reveals that many private university libraries in Nigeria operate without established preservation policies, undermining the potential for serious commitment to preservation programs. Similarly, Atanda (2017) identifies the lack of comprehensive preservation policies as a major challenge facing Nigerian libraries in their efforts to preserve electronic materials effectively.

The establishment of electronic libraries within Nigerian university systems, while representing significant technological advancement, introduces additional preservation risks. These systems typically host information across various platforms including websites, servers, hard disks, and other storage media, creating multiple points of vulnerability. Without proper preservation guidance and protective measures, disasters or system failures could result in complete loss of digital collections, leaving libraries with severely compromised information resources.

Therefore, the central problem addressed in this study is that university libraries in the current electronic era may fail to fulfill their primary objective of providing comprehensive information services to users in electronic formats if electronic preservation is not prioritized and systematically implemented. The increasing demand for electronic information resources by library users, combined with the persistent challenges of access, retrieval, and long-term preservation, necessitates urgent attention to develop and implement effective preservation strategies that ensure the continued availability and usability of electronic materials for both current and future generations of library users.

Objectives of the Study

The objective of this study was to investigate the preservation of electronic library materials in private university libraries in Anambra state. The specific objective of this study is set to achieve the following objectives:

1. To determine the preservation practices of electronic materials in Private University Libraries To determine the storage media that is used to preserve electronic materials in Private University Libraries in Anambra States.
2. To determine the technique used to preserve electronic materials in Private University Libraries in Anambra States.
3. To determine the challenges faced in preservation of electronic materials in Private Universities in Anambra state



Research Questions

The following research questions were used for the study.

1. What storage media are used to preserve electronic materials in Private University Libraries in Anambra States?
2. What are the techniques used to preserve electronic materials in Private University Libraries in Anambra States?
3. What are the challenges faced in preservation of electronic materials in Private University Libraries in Anambra States?

LITERATURE REVIEW

The preservation of electronic materials in contemporary library environments necessitates the implementation of sophisticated methodologies designed to address the inherent vulnerabilities of digital resources. Alegbeleye (2018) identifies five fundamental preservation practices employed by librarians to mitigate the challenges associated with electronic resource management. These practices encompass refreshing, which involves the systematic transfer of files from one physical storage medium to another to prevent physical deterioration or technological obsolescence, such as migrating content from one CD-ROM to another or transferring video files between identical formats.

Migration represents a more complex preservation strategy involving the conversion of electronic media from one format to another, exemplified by the transformation of VHS video content to DVD format or the conversion of legacy WordStar documents to contemporary Microsoft Word formats (Orakpor, 2006). Emulation emerges as a sophisticated approach to addressing technological obsolescence through the development of techniques that enable obsolete systems to function on future computer generations, thereby maintaining access to legacy content without requiring format conversion (Ezeofor, Okeke, & Orakpor, 2007). Duplication and replication strategies involve creating multiple backup copies of documents, either in identical formats or alternative formats, to ensure content

survival in the event of original file destruction, whether accidental or intentional (Orakpor, 2007).

Book digitization constitutes the conversion of printed materials into electronic formats through scanning processes, creating digital surrogates that enhance accessibility while preserving original content (Usiedi, Kalu, Nworie and Ibeh, 2022). Nwanguma (2006) advocates for restorative preservation approaches specifically designed for electronic library materials, emphasizing reformatting and duplication as primary intervention strategies. Institutional preservation management, as conceptualized by Library and Archives Canada (2001), encompasses comprehensive policy development, establishment of standards and guidelines for long-term material preservation, provision of appropriate storage conditions and accommodation, systematic collection surveys to assess physical conditions, and development of both comprehensive long-term and targeted short-term treatment plans (Orakpor, Ezejirofo, & Nwana, 2010).

Physical Protection and Storage Protocols

The preservation and management of library materials involves diverse activities designed to ensure material longevity and continued accessibility. Woodyard and Shenton (2013) of the British Library provide specific guidance for preventing deterioration of electronic media through physical protection measures and appropriate storage conditions. These guidelines emphasize avoiding direct surface contact to prevent scratching, recognizing that salt and grease deposits from human contact can cause destructive effects on storage media (Orakpor and Anyaoku, 2012). Environmental protection protocols require shielding electronic and digital media from liquids, dust particles, extreme temperatures, and direct sunlight exposure (Usiedi, Kalu, Nworie and Ibeh, 2022).

Proper storage methodologies mandate vertical positioning of electronic and digital media within purpose-designed storage containers, with rigid containers preferred over flexible sleeves due to superior protective capabilities (Okeke-John et al., 2013). Maintenance protocols include routine

Corresponding author: Orakpor, Adaora Maudlin

✉ am.orakpor@coou.edu.ng

Medical library, Chukwuemeka Odumegwu Ojukwu University.

© 2023. Faculty of Technology Education. ATBU Bauchi. All rights reserved



cleaning of drive mechanisms to prevent media damage, avoiding prolonged storage of media within drive systems, and restricting label application to manufacturer-recommended areas only (Okore, Njoku, & Orakpor, 2013). These physical protection measures form the foundation of comprehensive preservation programs designed to maximize the operational lifespan of electronic materials.

Strategic Frameworks for Electronic Preservation

The UNESCO (2003) Charter on Preservation of Electronic Heritage establishes comprehensive strategic frameworks for electronic material preservation, emphasizing the implementation of evolving preservation strategies designed to achieve and maintain accessibility while addressing the preservation requirements of different electronic object layers (Okechukwu and Orakpor, 2017). These strategies include collaborative engagement with content producers, creators, and distributors to implement standards that extend the effective operational life of access mechanisms while reducing the scope of unknown management challenges. (Usiedi, Kalu, Nworie and Ibeh, 2022).

The UNESCO framework recognizes the practical limitations of universal preservation, necessitating selective preservation policies that identify materials warranting long-term preservation (Orakpor, 2020). Content placement policies ensure materials are housed in secure environments, while structured metadata and comprehensive documentation systems facilitate access and support all preservation processes (Orakpor and Omoruyi, 2022). Data integrity and identity protection measures safeguard against corruption and unauthorized modification, while appropriate access provision strategies address technological change challenges. Preservation program management emphasizes cost-effective, timely, holistic, proactive, and accountable approaches to achieving preservation objectives.

Access-Preservation Nexus

Contemporary library science recognizes that preservation programs exist

primarily to facilitate access rather than restrict it. The British Library's decade-long research initiative, as documented by Alison Walker, culminated in an International Conference on the Preservation and Long Term Accessibility of Electronic Materials, demonstrating significant impact on United Kingdom preservation practices. This research established the fundamental principle that electronic environments require preservation measures to ensure access, with preservation viewed as access facilitation rather than impediment. The watchword "no access without preservation" encapsulates this paradigmatic shift in preservation philosophy (Orakpor, 2020).

The most significant threats to electronic continuity involve the loss of access mechanisms, as electronic materials cannot be considered preserved if access means have been compromised or eliminated (Orakpor and Omoruyi, 2022). Electronic material preservation aims to maintain accessibility defined as the sustained ability to access essential, authentic content and purpose. Bachimont and Blanchette (2016) establish the intimate relationship between preservation and access from archival perspectives, characterizing preservation as protecting artifact physical integrity while access involves making artifacts available to public audiences through various mechanisms including reading rooms, procedures, and information systems (Usiedi, Kalu, Nworie and Ibeh, 2022).

These complementary approaches represent dual methods of content transmission across time, with preservation addressing physical object transmission through temporal dimensions while access addresses the transmission of cultural competence necessary for object interpretation and comprehension (Okeke-John et al., 2013). Electronic material preservation therefore encompasses comprehensive processes designed to ensure that information content stored in electronic devices receives appropriate care and management, including both digital content and physical storage media, to maintain readability, accessibility, and availability when required for scholarly and research purposes (Orakpor, 2020). Usiedi, Kalu, Nworie



and Ibeh (2022) posit that digital preservation is a process by which digital data is preserved in digital form in order to ensure the usability, durability, and intellectual integrity of the information contained therein.

METHODOLOGY

Research Design

This investigation employed a descriptive survey research design to examine the preservation practices of electronic materials in private university libraries. Nworgu (2015) characterize descriptive survey design as an approach that systematically describes and interprets existing phenomena, seeking to identify prevailing conditions, relationships, opinions, ongoing processes, evident effects, and emerging trends within specified contexts.

The descriptive survey design facilitates comprehensive exploration of current phenomenon status without requiring variable manipulation or experimental intervention. This methodological approach proved particularly appropriate for the present investigation as it involved systematic questionnaire-based data collection from a clearly defined population regarding existing preservation practices and procedures. The design's non-manipulative nature allowed for authentic assessment of current preservation strategies employed within the target institutional contexts.

Study Location and Institutional Context

The geographical scope of this research encompassed Anambra State, Nigeria, focusing specifically on private university library systems operating within this region. The investigation included five distinct private university libraries selected as representative institutions: Madonna University Library located in Okija, Legacy University Library, Tansian University Library situated in Umunya, Paul University Library, and Peter University Library located in AchinaOnneh. These institutions collectively represent the private higher education library landscape within Anambra State and provide comprehensive coverage of electronic material preservation practices across diverse institutional contexts.

Study Population

The target population for this investigation comprised all professional librarians employed within the three private university library systems operating in Anambra State. The total population consisted of thirty librarians distributed across these institutional libraries, representing the complete professional library workforce engaged in electronic material management and preservation activities within the specified geographical and institutional parameters. This population size reflects the current staffing levels of professional library personnel responsible for electronic resource management in private university settings within the study region.

Sampling Procedures

Given the relatively small size of the target population, comprehensive population sampling was implemented rather than probabilistic or non-probabilistic sampling techniques. The entire population of thirty librarians constituted the study sample, ensuring complete representation of all professional library personnel engaged in electronic material preservation activities within the designated private university libraries. This census approach eliminated sampling bias and provided comprehensive coverage of the target demographic, enhancing the validity and reliability of the research findings.

Data Collection Instrumentation

The primary data collection instrument consisted of a structured questionnaire specifically designed to capture comprehensive information regarding electronic material preservation practices. The questionnaire incorporated multiple measurement components organized into distinct thematic sections addressing different aspects of preservation methodology and implementation. The first section examined storage media utilized for electronic preservation purposes, featuring six enumerated storage media options commonly employed in preservation activities.

The second section investigated specific techniques employed in electronic material preservation, incorporating twenty

distinct preservation measures representing contemporary best practices in digital preservation methodology. The final section assessed challenges encountered in electronic material preservation implementation, featuring seven identified challenge categories commonly experienced by library professionals engaged in digital preservation activities. This multi-dimensional approach ensured comprehensive data collection across all relevant aspects of electronic preservation practices and experiences.

Data Analysis Method

The collected data underwent systematic analysis utilizing descriptive statistical procedures appropriate for the research design and data characteristics. Research questions were systematically addressed through tabular presentation of findings, with analytical interpretation based on percentage distributions, mean score calculations, and standard deviation measurements. These statistical measures provided comprehensive descriptive analysis of respondent perspectives and institutional practices regarding electronic material preservation.

The analytical framework employed a four-point Likert-type rating scale with assigned

numerical values facilitating quantitative analysis of qualitative responses. The rating system assigned the following numerical values: Strongly Agree responses received a value of four, Agree responses received a value of three, Disagree responses received a value of two, and Strongly Disagree responses received a value of one. This numerical assignment enabled systematic calculation of mean scores and standard deviations for comprehensive statistical analysis. A criterion mean of 2.5 was established as the threshold for determining positive versus negative response patterns, calculated as the mathematical average of all possible response values. This midpoint criterion was derived through the calculation: $(4+3+2+1)/4 = 2.5$, representing the neutral position on the four-point scale. Response means exceeding 2.5 were interpreted as indicating positive agreement with survey items, while means below 2.5 indicated negative responses or disagreement with presented statements or practices.

RESULTS

Research Question 2: What storage media are used to preserve electronic materials in you University

Table 2: Mean ratings on the storage media are used to preserve electronic materials in you University

S/N	Items	Mean	SD	Remark
1.	E-Books:	3.42	.95	Agree
2.	Dissertations and Theses	3.49	1.00	Agree
3.	Government Documents and Reports	2.88	1.02	Agree
4.	Online Learning Resources	2.79	1.03	Agree
5.	Digital Archives and Special Collections	2.52	1.06	Agree
6.	Software and Simulation Tools	2.51	1.13	Agree

The investigation into storage media employed for electronic material preservation in private university libraries revealed comprehensive agreement among respondents regarding the utilization of various digital preservation formats. Analysis of the six identified storage media categories demonstrated mean ratings ranging from 2.51 to 3.49, with all items receiving positive endorsement above the criterion

threshold of 2.5. Electronic books achieved the second-highest mean rating of 3.42 (SD = 0.95), while dissertations and theses garnered the highest acceptance with a mean of 3.49 (SD = 1.00).

Government documents and reports received substantial support with a mean of 2.88 (SD = 1.02), followed by online learning resources at 2.79 (SD = 1.03). Digital archives and special

collections achieved a mean of 2.52 (SD = 1.06), while software and simulation tools received the lowest but still positive rating of 2.51 (SD = 1.13). These findings indicate that private university libraries in Anambra State actively employ diverse storage media formats to support their electronic preservation initiatives, demonstrating

comprehensive understanding of digital preservation requirements across multiple content categories.

Research Question 2: What are the techniques used to preserve electronic materials in your university?

Table 2: Mean ratings on the technique used to preserve electronic materials in your university

S/N	Items	Mean	SD	Remark
1.	Deciding on the formats that will be accepted for preservation, possibly by negotiating with producers to widely accepted standards & file formats, and providing adequate documentation.	3.51	1.18	Agree
2.	Lamination	2.54	1.10	Agree
3.	Copying data to more stable media and making backup copies by using good quality media storing media in appropriate conditions	2.53	1.22	Agree
4.	Storing data securely, including offsite storage for backups if possible	2.57	.85	Agree
5.	DE acidification	1.32	.79	Disagree
6.	Encapsulation	1.81	1.29	Disagree
7.	Recording information that will be needed to provide short term access – the identity of the material, access requirement, password etc.	2.61	1.15	Agree
8.	Retaining necessary access equipment and software, i.e., maintaining hardware, and protecting software with license arrangements	2.75	.74	Agree
9.	Liaising with other libraries who have similar interest or experience in preserving the kind of materials that you are interested in and seeking their guidance and mentoring	2.88	.78	Agree
10.	Having a disaster plan by alternatively finding ways to adequately reflect the material in a stable non digital form (such as printing out).	2.66	1.00	Agree
WEB Page (Database Online)				
11.	Allocating responsibility to a skilled and trained staff to manage the data	2.95	.78	Agree
12.	Protecting data by using third party service providers to maintain access online	2.73	1.06	Agree
13.	Have plans to continue to provide access to users in case the services of service providers are discontinued	2.82	1.18	Agree
14.	Copying out data to a more secure storage media for adequate back up	2.59	1.17	Agree
15.	We use preservation, conservation and techniques in our library	2.70	.76	Agree
16.	The information in non-print materials are transferred to other storage media for duplication	2.55	1.00	Agree
17.	Our library have Electronic resources in its collection	2.66	.97	Agree
18.	Our library has trained staff on preservation of electronic materials	2.66	1.28	Agree
19.	Our library has a preservation policy	2.63	1.01	Agree
20.	The practices provide guidelines on security of electronic materials	3.54	1.27	Agree

The examination of preservation techniques employed in electronic material management revealed significant variation in implementation patterns across the twenty assessed methodologies. Respondents demonstrated strong agreement with eighteen of 3.51 (SD = 1.18). However, two preservation techniques received negative responses, indicating implementation gaps in traditional preservation methodologies. Deacidification achieved a mean of only 1.32 (SD = 0.79), while encapsulation received 1.81 (SD = 1.29), both falling below the acceptance threshold. These findings suggest that while private university libraries demonstrate proficiency in digital preservation techniques, they exhibit limited engagement with conventional preservation

the twenty techniques, with mean ratings spanning from 2.51 to 3.54. The highest-rated technique involved establishing guidelines for security of electronic materials, achieving a mean of 3.54 (SD = 1.27), followed closely by format standardization negotiations with producers at methods typically associated with physical material conservation. The data indicates successful adoption of contemporary electronic preservation strategies while revealing deficiencies in traditional preservation approaches that may be relevant for hybrid collection management

Research Question 3: What are challenges faced in preservation of electronic library materials in your university?

Table 3: Mean ratings on the challenges faced in preservation of electronic library materials in your University

S/N	Items	Mean	SD	Remark
1.	Continuous migration	3.51	.65	Agree
2.	Lack of collaboration and partnership	3.10	.99	Agree
3.	Lack of awareness	2.95	1.01	Agree
4.	Technological obsolescence	3.16	.73	Agree
5.	Deterioration of the electronic materials	3.19	.99	Agree
6.	Lack of legislation and policy	2.81	.68	Agree
7.	Disaster planning and recovery	3.51	.65	Agree

The analysis of preservation challenges encountered in electronic library material management revealed universal acknowledgment of significant obstacles across all seven identified challenge categories. Mean ratings ranged from 2.81 to 3.51, with all challenges receiving positive agreement above the criterion threshold. Continuous migration requirements and disaster planning and recovery both achieved the highest challenge ratings at 3.51 (SD = 0.65), indicating these represent the most pressing concerns for library professionals. Deterioration of electronic materials received a mean of 3.19 (SD = 0.99), while technological obsolescence garnered 3.16 (SD = 0.73), both reflecting substantial concern among practitioners. Lack of collaboration and partnership achieved a mean of 3.10 (SD = 0.99), lack of awareness received 2.95 (SD = 1.01), and lack of legislation and policy scored 2.81 (SD = 0.68). These findings demonstrate that private

university libraries face multifaceted challenges in electronic preservation implementation, with technical, organizational, and policy-related obstacles requiring comprehensive strategic approaches.

DISCUSSION OF FINDINGS

Preservation Practices and Strategies

The preservation practices implemented for electronic library materials in private universities within Anambra State reflect contemporary best practices aimed at ensuring long-term accessibility and usability of digital resources. These practices encompass comprehensive approaches to digital preservation that address both immediate access requirements and long-term sustainability concerns. The preservation techniques employed demonstrate sophisticated understanding of electronic material management, including systematic

Corresponding author: Orakpor, Adaora Maudlin

am.orakpor@coou.edu.ng

Medical library, Chukwuemeka Odumegwu Ojukwu University.

© 2023. Faculty of Technology Education. ATBU Bauchi. All rights reserved



documentation of material identity, access requirements, and authentication protocols. Regular data integrity verification, strategic placement of materials in secure storage environments, implementation of structured metadata systems, and allocation of preservation responsibilities to qualified personnel represent core components of effective preservation programs.

The preservation strategies identified align closely with UNESCO charter recommendations for electronic material preservation, emphasizing institutional decision-making regarding acceptable preservation formats and negotiation with content producers to establish standardized documentation practices. Appropriate storage conditions for media and data carriers, systematic data migration to stable media platforms, secure storage protocols including offsite backup capabilities, regular error checking procedures, and establishment of data refresh regimes suited to media lifecycles constitute fundamental preservation approaches.

These strategies also encompass retention of necessary access equipment and software, maintenance of hardware systems, protection of software through appropriate licensing arrangements, and development of institutional partnerships for knowledge sharing and mentoring opportunities. Alternative preservation approaches, including conversion to stable non-digital formats, allocation of trained personnel responsibilities, utilization of third-party service providers, contingency planning for service discontinuation, secure data backup procedures, and lossless data transfer protocols represent comprehensive preservation methodologies.

Identified Preservation Challenges and Constraints

The challenges encountered in electronic material preservation within Anambra State private university libraries reflect systemic issues that impede effective digital preservation implementation. Management support deficiencies and limited knowledge regarding electronic preservation programs represent

significant organizational obstacles that undermine preservation initiatives. Inadequate funding mechanisms for sustaining long-term preservation programs create resource constraints that limit institutional capacity for comprehensive digital preservation activities. Personnel shortages, particularly the lack of trained staff capable of managing electronic materials effectively, constitute critical human resource challenges that affect preservation program quality and sustainability.

Technical challenges include poor metadata standards and inadequate documentation practices that compromise long-term access and preservation effectiveness. Infrastructure limitations, including insufficient physical space and storage media accommodation, create practical obstacles for preservation program expansion. Technological obsolescence of electronic materials, encompassing both software and hardware compatibility issues, represents ongoing technical challenges requiring continuous adaptation and resource allocation. Disaster preparedness deficiencies, including inadequate disaster control planning and recovery protocols, create vulnerabilities that threaten preservation program integrity. Legal and intellectual property challenges, including insufficient copyright clearance procedures and unresolved rights management issues, create compliance obstacles that affect preservation program implementation.

CONCLUSIONS AND RECOMMENDATIONS

The research findings reveal that private university libraries in Anambra State operate under significant constraints that affect their electronic preservation capabilities. These institutions demonstrate insufficient staffing levels of qualified personnel equipped to manage electronic materials effectively, coupled with inadequate sustainable funding mechanisms necessary for long-term preservation program support. The practice of preserving electronic materials without appropriate copyright permission and content owner agreements represents a significant legal and ethical concern requiring immediate attention. Nevertheless, the



continued growth and development of electronic library materials indicates the persistent importance of digital preservation initiatives despite the numerous implementation challenges identified.

Based on these findings, several critical recommendations emerge for improving electronic preservation practices in private university libraries. Management must prioritize the provision of essential infrastructure, storage media, and preservation facilities to support comprehensive electronic material preservation programs. The adoption of appropriate preservation techniques and strategies aligned with international best practices becomes essential for ensuring long-term accessibility and future utilization of digital collections. Professional development initiatives, including systematic training through seminars, workshops, conferences, and user education programs, must be implemented to enhance librarian competencies in electronic material preservation. Additionally, adequate funding allocation for electronic material acquisition and preservation program sustainability represents a fundamental requirement for effective digital preservation implementation and continued user service delivery.

REFERENCES

- Abram, S. (1997). Post Information Age Positioning For Special Librarians: Is Knowledge Management the Answer? *Information Outlook* 20-21
- Adebayo A. Bello (2018) *World Journal of Research and Review (WJRR)* ISSN:2455-3956, Volume-6, Issue-2, February 2018
- Adeniyi, A. N. & Oshinaike, A. B. (2009) Managing crisis in Nigeria Academic Libraries. In F. A. Oyesiku, et (ed) *Current trends in library information science*. Ibadan: BIB press Ltd. 99 – 108.
- Agarwal, N.K., & Islam, M.A. (2014). Knowledge management implementation in a library: Mapping tools and technologies to phases of the KM cycle. *VINE: The Journal of Information and Knowledge Management System*, 44(3), 322–344.
- Ajie, I (2019), *Issues and Prospects of Knowledge Sharing in Academic Libraries*; <https://digitalcommons.unl.edu/libphilprac> Part of the Library and Information Science Commons
- Akande, S.O. (2010). Influence of knowledge and perception on personal attitude towards preservation of information resources in federal university in Nigeria. (PHD Thesis) submitted to the faculty of education, Department of library, Archival and Information Studies, Nigeria
- Akparobore, Daniel (2015) *Knowledge Sharing Among Librarians in University Libraries in*
- Alegbeleye, B. (2008) *past imperfect, present continuous, future perfect: the challenges of preserving recorded information in Nigeria*. Inaugural lecture delivered at the University of Ibadan: Ibadan university press.
- Allee, V. (1997). *The knowledge evolution: expanding organizational intelligence*. Boston: Butterworth-Heinemann.
- Alumona, A.I and Ibeh, B. O (2021). Academic libraries and dissemination of COVID- 19 information for healthy academic environment. *Madonna journal of research in library and information science*, 4(2), 72-81. <https://www.researchgate.net/publication/391482332>
- Alumona, A.I, Anizor, N.S, and Ibeh, B.O (2021). The role of libraries in election participation of youths in Nigeria. *International journal of social sciences and humanities reviews (IJSSHR)*, 11(1), 210-216. <https://www.ijsshr.com/journal/index.php/IJSSHR/article/view/689/591>
- American Library Association. (2003). *Academic librarianship and the redefining scholarship project*. http://www.ala.org/.../White_Papers_and_Reports/Academic_Librarianship_and_the_Redefining_Scholarship_Project.htm (accessed 12.06.03).
- Anike, A.N., Nwankwo, N.G and Ibeh, O. B(2023). Preparedness of Nigerian University Libraries and Librarians for Service Delivery in Post Covid 19. *International journal of library and information science*

Corresponding author: Orakpor, Adaora Maudlin

✉ am.orakpor@coou.edu.ng

Medical library, Chukwuemeka Odumegwu Ojukwu University.

© 2023. Faculty of Technology Education. ATBU Bauchi. All rights reserved



- studies, 9(2),9-20. <https://doi.org/10.37745/ijliss.15/vol9n2920>
- Anizor, N.S, Ibeh, B.O and Alumona, A.I (2021). Public library as a veritable tool for communal issues to National development in Nigeria. *International journal of social sciences and humanities reviews (IJSSHR)*, 11(1), 12-19. <https://www.ijsshr.com/journal/index.php/IJSSHR/article/view/645/546>
- Arora, J.(2009) Digital Preservation and Management: an Overview, in *PLANNER- 2006: Digital Preservation Management and Access to Information in the Twenty First Century*, Indian: AhMeddabad.
- Atanda, S., S. (2017). Digital preservation challenges in Nigeria libraries: awareness of challenges of digital preservation in Nigeria libraries – Liberians perceptive. *Interdisciplinary digital preservation tools and technologies*. 13. Doi: 10, 4018/979-1-5225-1653-8. Ch003
- Atusiak, K., Yler, Newton, and Olepeddi, (2017), Finding access and digital Preservation Solutions or digitized real history project: case study", *digital library perspectives*, vol. 3o. p. 8-99.
- Backley, R. and Murray, P. C. (2000) What is Knowledge Management. Retrieved From <http://www.media.com/whatis.html>. 24th March 2014.
- Barquin, R. (2000). From bits and bytes to knowledge management. <http://www.barquin.com> (accessed 15.06.03).
- Barton, M. Mark, T., and Shearer, K. (2006). *Creating an institutional repository: LEADIRS workbook*.
- Bawack, R. (2020) *Implementing Knowledge Management in Academic Libraries in Cameroon: A Librarian's Perception*; Advanced School of Mass Communication (ASMAC), University of Yaoundé II, Cameroon. Received: 25 Feb 2020, Revised: 19 April. 2020, Accepted: 28 Jun. 2020. Published online: 1 Aug 2020.
- Bell, B., (ed.). (2000). *Strategic initiatives*. <http://www.nu.ac.za/strategic> (accessed 2.07.03).
- Bhatt, R.K (2010) *University Libraries in India: Issues and Challenges*. *Journal of Library and Information Science*. 35(1) 51-64.
- Binwal, J.C (2001) *Knowledge Management*. *IASLIC Bulletin*. 46(2) 65-78.
- Buki, M. (2012). *Impact of Information and Communication Technology Literacy, Record Storage, Maintenance Culture and Record Management Ability of Small business in Kaduna*. Masters Thesis, Faculty of Education Ahmadu Bello University, Zaria.
- Edem, Nkoyo B. and Ani, Okon (2010). *Knowledge management in academic libraries in Nigeria*. Paper presented at the 48th National Conference of the Nigeria Library Association, Abuja, 2010.
- Ekereuche, A. C and Ibeh, B. O (2019). Challenges of providing information resources for the sustainability of inclusive education for internally displaced persons (IDPs) in Nigeria. *International journal of educational research and development*, 7(1), 87-93. <https://www.researchgate.net/publication/391045907>
- Elliott, S. (1996), "APQC conference Attendees Discover the Value and Enablers of a Successful KM Program", *Knowledge Management in Practice*, Vol. 5 (Dec-96/Jan-97), pp.1-8.
- Etim, F.C. (2010). *Library and information science perpectives: a compendium of researches of Felicia Edu-EwemEtim*. Akwalbom: Nigeria Library Association.
- Eze, S.P. (1999). *Information and education in democracy in Nigerian Library Association*, information for the sustenance of a democratic culture, A compendium of paper presentations at the 1999 NLA Annual National Conference and A GM, Port-Harcourt. Foundation for Electronic Government, Knowledge Management Conference Proceedings (Washington, D.C.: Foundation for Electronic Government, 2000).
- Goddard, M. (2020). *The impact of knowledge management on innovation in academic*

Corresponding author: Orakpor, Adaora Maudlin

✉ am.orakpor@coou.edu.ng

Medical library, Chukwuemeka Odumegwu Ojukwu University.

© 2023. Faculty of Technology Education. ATBU Bauchi. All rights reserved



- libraries. *Pathfinder: A Canadian Journal for Information Science Students and Early Career Professionals*, 1(2), 72-81.
<https://doi.org/10.29173/pathfinder9>
- Gracy, K. F., and Kahn, M. B. (2012). Preservation in the Digital age. *Library Resources and Technical Services*, 56(1), 25-43.
- Grover, R. and Greer, R.C. 1991. The crossdisciplinary imperative of LIS research. In: McClure, CR &Hernon, P. (eds), *Library and information science research: perspectives and strategies for improvement*. Norwood, NJ: Ablex, 101–113.
- Grünbaum, N.N. 2007. Identification of ambiguity in the case study research typology: what is a unit of analysis? *Qualitative Market Research*, 10(1): 78-97.
- Hamid, S. and Nayan, J.M. 2007. Preliminary study of knowledge management in a library: a case study of the National Library of Malaysia. Malaysia: Kuala Lumpur.
- Hamid, S., Nayan, J.M., Bakar, Z.A. and Norman, A.N. 2007. Knowledge management adoption and implementation readiness: a case study of the National Library of Malaysia. In: *Building an information society for all: proceedings of the International Conference on Libraries, Information and Society, ICOLIS 2007*, Armada Hotel, Petaling Jaya, 26–27.
- Han, .A. and hatti, (2017), Digital competencies or developing and managing digital libraries: N investigation from university librarians in Pakistan", *the electronic library*, vol. 5. O., p. 33-142.
- Hancock, B. 1998. *Trent focus for research and development in primary health care: an introduction to qualitative research*. Nottingham: Trent Focus.
- Ibeh, B.O and Ekereuche, A. C (2019). Expectations of public and national libraries towards inclusive education at the primary and post primary education level. *International journal of social sciences and humanities reviews*, 9(2), 73-81.
<http://www.ijsshr.com/journal/index.php/IJSSHR/article/download/508/pdf>
- Ibeh, B.O, Alumona, A.I, and Anizor, N.S (2019). *Libraries as Platform for Nation Building*. International journal of arts, language and business studies (IJALBS), 2(2), 100-105.
- Islam, M. A., Agarwal, N. K., & Ikeda, M. (2015a). Knowledge Management for Service Innovation in academic libraries: A qualitative study, *Library Management*, 36(1/2), 40-57.
- Kemoni, H.N. (1996). Preservation and conservation of archives materials: the case study of Kenya .*Afri of Lib. Arc &infor. sci.* 6(1), 46-51.
- Maier, R. (2007). *Knowledge management systems: Information and communication technologies for knowledge management* (Third edition). Springer.
- Maponya, P.M. (2004) Knowledge management practices in academic libraries: a case study of the University of Natal, Pietermaritzburg Libraries; Information Studies Programme, School of Human and Social Studies, University of KwaZulu-Natal, Pietermaritzburg, South Africa; maponyap@ukzn.ac.za
- Marconi, J. (2001). Outside the square: library and information services innovations within a knowledge management context. *ALIA Conferences: 9th Specials, Health and Law Libraries Conference*.
<http://conferences.alia.org.au/shll2001/papers/marconi.html> (accessed 27.01.04).
- Martensson, M. (2000). A critical review of knowledge management as amanagement tool. *Journal of Knowledge Management*, 4(3), 204-216.
- Mavodza, J. and Ngulube, P. (2011), Exploring the use of knowledge management practices in an academic library in a changing information environment University of South Africa, Department of Information Science jravidro@yahoo.com; ngulup@unisa.ac.za
- Mbambo – That, (Ed.) (2007). *Building a digital library at the university of Zimbabwe*, , INASP ,Oxford: INASP
- McManus, D. and Loughridge, B. (2002). Corporate information, institutional cultureand knowledge management: a UK university library perspective. *New Library World*, 103(1180), 320-327.

Corresponding author: Orakpor, Adaora Maudlin

✉ am.orakpor@coou.edu.ng

Medical library, Chukwuemeka Odumegwu Ojukwu University.

© 2023. Faculty of Technology Education. ATBU Bauchi. All rights reserved



- MdNazmul, I. and AbdurRazzak (2020), Problems of knowledge management practices in libraries and information centres of Bangladesh; International Federation of Library Associations and Institutions 2020, Vol. 46(1) 34–51 The Author(s) 2020 Article reuse guidelines sagepub.com/journals-permissions DOI: 10.1177/0340035219894359 journals.sagepub.com/home/iftl.
- Murphy, . (2008), Task force takes in data-preservation challenges", research information, August 0, vol. 5, p. -19.
- National Archives of united kingdom.(2013). Preserving Storage Media. Retrieved on June 2, 2013 from <http://www.nationalarchives.gov.uk/document/selecting-storage-media>
- Nazim, M. and B. Mukherje, Implementing knowledge management in Indian academic libraries. Journal of Knowledge Management Practice., **12(3)**, (2011) Nigeria, Delta state university, Abraka Email: danakpos@gmail.com
- Nonaka, I (1991). Models of knowledge management in the West and Japan.
- Nwabueze, A.U and Ibeh, B.O (2016). Extent of ICT Literacy Possessed by Librarians in Federal University Libraries in South East Nigeria. International Journal of Digital Literacy and Digital Competency (IJDLC), 7(3), 13-22. <https://doi.org/10.4018/IJDLC.2016070102>
- Nwabueze, A.U, Ibeh, B.O, and Okoye, C.O. (2016). Extent of ICT – Based Library Services Rendered by Librarians in Federal University Libraries in South East Nigeria. International Journal of Science and Technology, 3(1), 134-143. <https://www.researchgate.net/publication/391277632>
- Nwankwo, N.G; Anike, A.N and Ibeh, O. B(2022) Challenges in the selection and acquisition of grey literature in Nigerian libraries. International journal of informational science studies, 8(4),14-23. <http://www.eajournals.org/wp-content/uploads/Challenges-in-the-Selection.pdf>
- Ofodile, J. O and Orakpor, A.M. (2009). Evaluation of School Library Development in Ayamelum Local Government Council of Otuocho Educational Zone. *Anambra State Library and Information Digest: Journal of the Nigeria Library Association*.3 (1) 13 – 24 <https://AdaoraOrakpor<scholar.google.com>
- Ogunmodede, T. and Ebijuwu, A.F.S. (2013) Problems of Conservation and Preservation of Library Resources in African Academic Libraries: A review of Literature. *Green Journal of SocialSciences*.vol 3(1) 050-052
- Okechukwu, Ifeoma C. and Orakpor, Adaora.M(2017). Current Trends in Information Brokerage and Consultancy in Nigeria.*Ebonyi. Journal of Library and Information Science*. 4(2):305-314. <https://scholar.google.com/citations?user=hd8MRigAAAAJ&hl=en>
- Okeke-John, R; Ibegbulam, .I. Orakpor, A.M and Asom, F (2013). Libraries as Change Agent for Promoting Knowledge Society for Sustainable Development. *Global Review of Library and Information Science*.(9): 1 – 15 <https://www.researchgate.net>286442572>
- Okoye, C.O. and Ibeh, O.B (2013). "Library and Democratic Governance in Nigeria". *Journal of arts and social sciences*.5(2). 166-177. <https://www.researchgate.net/publication/391045875>
- Oonan, (2014), Digital Preservation Framework: case study", DUCAUSE review, p. -3.
- Orakpor, A. M and Omoruyi, F.T (2022). Inspiring Online Library and Information Services During Covid'19: Perception of Information Professionals in Academic Libraries in Anambra State. *Library Research Journals*,(7):13 -21 Retrieved from<https://journals.unizik.edu.ng/index.php/Irj/article/view/1476>
- Orakpor, A.M. (2007). The Internet and Information Resources for State and PublicLibrary Development in the 21st Century. *Anambra State Library and Information Digest: Journal of the Nigeria Library Association*. 1 (1): 37-

Corresponding author: Orakpor, Adaora Maudlin

✉ am.orakpor@coou.edu.ng

Medical library, Chukwuemeka Odumegwu Ojukwu University.

© 2023. Faculty of Technology Education. ATBU Bauchi. All rights reserved



- 42.<https://AdaoraOrakpor<scholar.google.com>.
- Orakpor, A.M. (2020). Libraries and Restructuring Questions in Nigeria: The South Eastern Librarians' Perception. Library and Philosophy and Practice e- journal 4616. <https://digitalcommons.unl.edu/libphilprac/4616>
- Orakpor, A.M. and Anyaoku, Ebere (2012). Knowledge and use of web 2.0 by Librarians. *African Journal of Library Archives and Information Science*. <https://www.semanticscholar.org/Orakpor>
- Orakpor, A.M. Ezejiogo, V.O. and Nwana, REA (2010). Information and Communication Technology in Library School Education in Anambra State. *Anambra State Library and Information Digest: Journal of the Nigerian Library Association*. 4 (1): 23 – 34 .<https://AdaoraOrakpor<scholar.google.com>
- Poonkothai R. (2016), Knowledge Management as an important tool in Library Management; Librarian, Government Arts College, Trichy-22, Tamil Nadu E-mail: koswami@gmail.com
- Preservation Advisory centre retrieved from <http://www.bl.uk/blpac/publicationsleaf.html> on 27th February, 2013.
- Sambo, A.S., and Saturday, U.(2014). Awareness of digital preservation Strategies by Librarians in Nigeria. *International journal of information search* 4(1). Retrieved on April 26, 2015 from <http://www.spoars.org/journal/v3n4p6>
- Ukachi, N.B. (2011) Electronic information resources and undergraduate users 'Patronage in university of Lagos library: A survey. *Madonna Journal of Research in Library and Information Science*, 1 (2) 21-34 Retrieved from <http://www.comp.lancs.ac.uk/Corina/CHI06workshop/papers/Bachimont.p>
- Usiedi, B.A, Kalu, C.O, Nworie J.C., & Ibeh, O.B. (2022) Preservation and Conservation of library resources in Nigerian libraries: A review. *Communicate journal of library and information science*, 24(2). <http://www.cjolis.org/index.php/cjolis/article/view/15>
- Walker, Alison (2013) Basic Preservation for Library and Archive Collections. London:
- Wamalwa, L. Wanangeye, B. Omallah, G. (2016). Knowledge Management Practices and Performance of Academic Libraries: A Case of Mount Kenya University, Kigali Campus Library; *World Journal of Computer Application and Technology* 4(2): 34-39, 2016 <http://www.hrpub.org> DOI: 10.13189/wjcat.2016.040202
- Wen, S. (2005). Implementing knowledge management in academic libraries: a pragmatic approach. 3rd China-US Library Conference, Shanghai.
- Wilson T.C. (2017), "Rethinking digital preservation: definitions, models, and requirements", *Digital Library Perspectives*, 33(2), pp.128136.