

## Digitalizing Theses and Dissertations for Accessibility and Visibility of Research Outputs: Evidence-Based Study of the TERAS Institutional Repository

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### Abstract

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*This study investigates university libraries' efforts to digitalize theses and disseminate them through the TERAS institutional repository using an evidence-based approach for running IRs in Nigeria and the challenges therein. It was guided by five research objectives and six research questions, administered to selected categories of university library staff. Data from a sample of 138 respondents, including library staff and university stakeholders, were collected through a Likert scale structured questionnaire, and was analyzed using descriptive statistics. The findings reveal significant obstacles, including unreliable internet connectivity, inconsistent power supply, and outdated or insufficient digital systems. The study further highlights the limited training and expertise of library staff in managing institutional repositories, which compromises the accessibility and visibility of research outputs using the TERAS. The impact of these challenges extends to diminished global reach and limited academic collaboration. The study concludes by recommending strategic investments in digital infrastructure, continuous professional development for staff, and the formulation of clear intellectual property policies to encourage submissions to institutional repositories, among other things.*

### Introduction

Academic libraries support their institutions' teaching, learning, and research objectives by serving their communities with diverse services, including user education, circulation, reference, and increasingly, electronic/digital/virtual library services (Adeniran & Oyovwevotu, 2019; Rabi, 2020, 2021). These

digital services encompass online catalogs, e-books, e-journals, open access, and institutional repositories (IRs) (Anunobi & Onyebinama, 2011; Johnson et al., 2019; Ramírez & Tejada-Artigas, 2020). IRs are crucial for preserving and showcasing an institution's scholarly output, providing open access to research papers, theses, and other works, thereby enhancing the institution's reputation and promoting collaboration (Prabhakar & Rani, 2018).

Recognizing the importance of IRs, Nigeria's Tertiary Education Trust Fund (TETFund) initiated the Digitization of Thesis Project in December 2021, aiming to establish a centralized mechanism (TERAS - Tertiary Education Research and Application Systems) for storing digitized academic output across beneficiary institutions (TETFund, 2024). A nine-month assessment revealed significant lags in structured digitized theses and a national research repository (Echono, 2022). While some progress exists, approximately 80% of institutions are yet to achieve significant digitization, with only about 10% having digitized a considerable volume of theses (Echono, 2022; TETFund, 2024).

TERAS now serves as Nigeria's largest collection of digitized theses, offering bidirectional access and synchronization across institutional repositories. It allows users to search and access research nationwide, and enables researchers to publish their work. IRs often adhere to open standards, promoting copyright retention and discoverability. Digitization, the process of converting analogue materials to electronic formats, is becoming a norm for libraries seeking to contribute to global information resources (Jagboro et al., 2012; Anunobi & Onyebinama, 2011). While beneficial for global visibility and knowledge sharing, especially for developing economies like Nigeria, the process has been slow and expensive, particularly for school and public libraries, with some academic libraries still in early stages (Jagboro et al., 2012).

### **Statement of the Problem**

Digitized theses and dissertations (DTDs) should be openly accessible, precise digital copies preserving the integrity of scholarly works, aligning with open access principles for unrestricted research access, particularly benefiting developing nations like Nigeria. While DTDs theoretically improve

visibility, accessibility, and preservation, and national initiatives like TERAS exist, Nigerian universities face challenges in efficient digitization. Inadequate infrastructure, funding, staff capacity, and internet connectivity impede effective DTD dissemination. This study investigates current digitization efforts in Nigerian universities, focusing on TERAS, and explores persistent obstacles to realizing the full potential of DTDs in university libraries.

### **Research Objectives**

This study examines challenges affecting thesis dissemination via institutional repositories in Nigerian university libraries and proposes improvements. Key objectives include evaluating universities' digitization efforts through TERAS, assessing infrastructure and resources, evaluating library staff knowledge and skills in digitization, identifying challenges hindering digitization and dissemination, and encouraging strategies to address these challenges. These objectives are directly translated into corresponding research questions.

### **Empirical Review of Literature**

Digitization is crucial for scholarly material preservation and increased research visibility (Akinola et al., 2024; Abdulsalami et al., 2015; Anunobi & Onyebinama, 2011). Institutional repositories also enhance digital accessibility and global research reach (Singh et al., 2020; Uba & Okonkwo, 2021). Challenges include inadequate policy frameworks, insufficient funding, and poor ICT infrastructure (Akinola et al., 2024; Uba & Okonkwo, 2021). Future research should explore new technologies, user experiences, and policy effectiveness to improve digital preservation in higher education.

### **Theoretical Framework**

This study employs a dual theoretical framework, integrating the Diffusion of Innovations Theory (DOI) and the Technology Acceptance Model (TAM). DOI provides a macro-level perspective on the adoption of institutional repositories (IRs) as an innovation across Nigerian universities, identifying adoption factors and classifying adopter categories. TAM offers a micro-level view, focusing on individual

user acceptance based on perceived usefulness and ease of use.<sup>1</sup> This combined approach enables a comprehensive analysis of IR adoption, considering both the broader organizational context and individual user perceptions, to inform targeted solutions for enhancing IR effectiveness.

## **Research Methodology**

This study utilized a descriptive survey research design to investigate the digitization of theses and dissertations and their dissemination via Institutional Repositories (IRs) in Nigerian university libraries, while also identifying associated challenges. A multistage sampling technique, combining stratified (by university ownership and geopolitical zone) and purposive (selecting universities with active digital repositories and key personnel involved in digitization) sampling, was employed. A total of 36 universities were sampled (three federal and three state from each of the six geopolitical zones), and 108 respondents (University Librarian, Head of IR, and ICT expert from each library) were purposively selected. Data were collected using a structured questionnaire with Likert-scale and closed-ended items, and analyzed using SPSS. A mean score of 2.5 served as the benchmark for sufficient support/agreement, and the standard deviation (SD) measured response consistency.

## **Result and Discussion of Research Findings**

### **Response Rate Response Rate**

A total of 190 copies of the questionnaire were distributed and 138 i.e., 72.63% were returned, which is acceptable and in line with Morton, S.M.B., Bandara, D.K., Robinson, E.M. and Carr, P.E.A. (2012) and Cleave, P (2022) standards.

**Table 1: Effectiveness in digitalizing PhD research output through TERAS**

S/N	Statement	SD	D	A	SA	Mean	STD
1	Universities have successfully implemented TERAS to enhance the digitalization of research output.	13	36	46	43	2.84	0.94
2	Adequate training and support have been provided to help researchers utilize TERAS effectively.	27	27	41	43	2.77	1.05
3	Universities have sufficient infrastructure and technology to support the digitalization of research output through TERAS.	65	58	11	4	1.66	0.79
4	The integration of TERAS has improved accessibility and dissemination of theses and dissertations.	31	33	38	36	2.55	1.09
5	Institutional policies actively support and encourage the use of TERAS for managing research outputs.	32	35	46	25	2.46	1.01

**Key:** SD (Strongly Disagreed); D (Disagreed); A (Agreed); SA (Strongly Agreed); STD (Standard Deviation)

Based on the data in Table 1, the analysis of responses to the five items on TERAS implementation revealed varied perceptions among respondents. The first item showed a moderately high mean of 2.84 (SD = 0.94), indicating general agreement that TERAS has been successfully implemented. The second item, with a mean of 2.77 (SD = 1.05), reflected moderate agreement on the adequacy of training and support, though views were mixed. The third item scored the lowest mean of 1.66 (SD = 0.79), highlighting a strong consensus on the lack of sufficient infrastructure and technology. For the fourth item, the mean of 2.55 (SD = 1.09) suggested moderate agreement on improved accessibility and dissemination, albeit with notable variation. Lastly, the fifth item yielded a mean of 2.46 (SD = 1.01), showing slight agreement on policy support for TERAS, but also pointing to inconsistencies in policy implementation and awareness.

**Table 2: Current State of Digital Infrastructure and Resources**

S/N	Statement	SD	D	A	SA	Mean	STD
6	Reliable and high-speed internet is available	57	43	23	15	1.97	1.01
7	Digital infrastructure is sufficient	1	1	64	72	3.50	0.55
8	Adequate digital preservation tools exist	1	1	67	69	3.48	0.55
9	Inadequate budget allocations for digitalization	13	12	56	57	3.14	0.93
10	No collaborative efforts among universities	4	12	67	55	3.25	0.73

**Key:** SD (Strongly Disagreed); D (Disagreed); A (Agreed); SA (Strongly Agreed); STD (Standard Deviation)

Table 2 indicates that the majority of the respondents strongly disagree that dependable internet is widely available, as indicated by the extremely low mean score of 1.97 a large proportion of respondents disagreed, and the standard deviation (1.01) suggests diverse opinions. There is strong agreement that tools and infrastructure are available for digital infrastructure and digital preservation tools with a mean of 3.50 and 3.48 respectively. Inadequate budget allocations for digitalization with a Mean score of 3.14, indicate unfavorable opinion about budgetary allocation. On collaborative efforts among universities a Mean score of 3.25 was obtained, there is a consensus that there is a lack of teamwork among university libraries toward digitalization and dissemination of research output. Digital tools and infrastructure are deemed largely adequate, the major weakness lies in internet connectivity across campuses. Budget sufficiency and collaborative efforts receive more mixed responses.

**Table 3: Staff Competency and Skills**

S/N	Statement	SD	D	A	SA	Mean	STD
11	Confident in metadata standards	17	27	41	53	2.94	1.03
12	Skills in digital preservation and file conversion	10	31	56	41	2.93	0.90
13	Understanding of copyright laws	13	27	71	33	2.86	0.87
14	Proficient in Institutional Repository (IR) software	11	9	62	56	3.18	0.87
15	Skilled in organizing and cataloguing digital materials	5	4	58	71	3.41	0.72

**Key:** SD (Strongly Disagreed); D (Disagreed); A (Agreed); SA (Strongly Agreed); STD (Standard Deviation)

Based on the above table, statements of items 11, 12 and 13 show a Mean score of 2.94, 2.93 and 2.86 respectively are moderately in agreement with the statement, at the same time it shows that some respondents lack confidence in metadata, proficiency in digital preservation and file conversion and lack some understanding in copyright laws. With a Mean of 3.18, the respondents show reasonable confidence in using repository software. With a Mean of 3.41, the respondents show high confidence in cataloguing skills with a consistent response pattern. Library staff generally display moderate to strong competence in digital skills, though specific areas like copyright and metadata show some gaps. Staff are most confident in cataloguing digital materials.

The analysis of standard deviation in Table reveals varying levels of agreement among respondents regarding staff competence, knowledge, and skills in the digitalization and dissemination of research

outputs in Nigerian university libraries. Item 11, which addresses confidence in managing metadata standards, recorded a high standard deviation of 1.03, indicating significant variability in respondents' self-assessed competence. This suggests that while some library staff feel adequately skilled in metadata management, others may lack the necessary training or experience. Similarly, Item 12, focusing on digital preservation strategies and file format conversion, showed a high standard deviation of 0.90, pointing to diverse skill levels among staff in this technical area. Item 13, which relates to understanding copyright and intellectual property rights, also demonstrated moderate variability with a standard deviation of 0.87, reflecting differences in legal literacy and institutional support on this subject. Items 14 and 15, which pertain to proficiency in using Institutional Repository (IR) software and cataloguing digital materials, recorded relatively lower standard deviations of 0.87 and 0.72 respectively, suggesting greater consensus and a generally higher level of confidence in these more practical, task-based skills. Overall, the standard deviation analysis of Table 3 indicates that while basic operational skills are fairly widespread among staff, there is a greater disparity in more specialized and technical competencies, highlighting the need for targeted capacity-building initiatives.

**Table 4: Challenges Confronting University Libraries in Nigeria in Digitalizing and Disseminating Research Outputs**

S/N	Statement	SD	D	A	SA	Mean	STD
16	Limited funding is a major barrier	2	4	63	69	3.44	0.63
17	Inconsistent power supply disrupts digitalization	1	1	64	72	3.50	0.55
18	Outdated digitalization software is a challenge	1	1	67	69	3.48	0.55
19	Copyright issues and submission-related issues	23	12	56	47	2.92	1.04
20	Resistance to digital platforms	4	12	67	55	3.25	0.73

**Key:** SD (Strongly Disagreed); D (Disagreed); A (Agreed); SA (Strongly Agreed); STD (Standard Deviation)

Table 4 reveals limited funding Mean = 3.44 which means the respondents overwhelmingly concur that the digitization of research output is severely hampered by limited funding. There is a high degree of agreement indicated by the low standard deviation (0.63). The factor with the highest score,

inconsistent power supply (Mean = 3.50), is considered a critical barrier. The standard deviation of 0.55 indicates a very high level of agreement among respondents. Another important issue that respondents strongly agreed on was outdated software (Mean = 3.48). This is supported by the consistency (STD = 0.55). There was less agreement among respondents (STD = 1.04) regarding copyright and submission issues (Mean = 2.92), suggesting a more divided view of its significance. 5. Digital platform resistance (Mean = 3.25): This received a slightly lower score, but it is still a cause for concern. Moderate variation (STD = 0.73) indicates some dissenting opinions. The Table reveals that university libraries in Nigeria face several critical challenges in digitalizing and disseminating PhD theses. Chief among them are inconsistent power supply, outdated software, and limited funding, all with high mean scores and low standard deviations, reflecting strong consensus among respondents. Resistance to digital platforms and copyright-related barriers are also acknowledged, although opinions on these are somewhat more varied.

**Table 5: Effect of Challenges on Accessibility and Visibility**

S/N	Statement	SD	D	A	SA	Mean	STD
21	Limited funding negatively impacts the visibility	6	12	53	67	3.31	0.81
22	Inconsistent power supply hinders digital efforts	1	1	63	73	3.51	0.55
23	Outdated software limits digitalization and dissemination	2	3	60	73	3.48	0.62
24	Copyright issues are a major bottleneck	14	21	44	59	3.07	0.99
25	Resistance to digital platforms hinders the sharing	12	8	49	69	3.27	0.91

**Key:** SD (Strongly Disagreed); D (Disagreed); A (Agreed); SA (Strongly Agreed); STD (Standard Deviation)

Limited funding negatively impacts visibility with a mean score of 3.31 obtained which shows limited funding has a significant impact on accessibility research output. On Inconsistent power supply hindering digital efforts, there was broad agreement that inadequate power supply is a major barrier in the research output, which is supported by a mean score of 3.51. Outdated software is a major setback that limits the digitalization and dissemination of research output, scoring a mean of 3.48 which is an indication that up-to-date software is extremely important in PhD research output digitalization and dissemination.



Copyright issues are a major bottleneck and the mean score of 3.07 affirmed that though relatively not a strong view. Resistance to digital platforms hinders sharing with a Mean of 3.27 showing that resistance has a significant impact on accessibility. Respondents agree overwhelmingly that infrastructural challenges—especially power supply and software—severely limit the accessibility and visibility of PhD research in Nigeria.

The analysis of standard deviation in Table 5 provides insight into how respondents perceive the impact of various challenges on the accessibility and visibility of research outputs in Nigeria. Item 21, which links limited funding to restricted access and visibility, recorded a moderate standard deviation of 0.81, indicating some variation in opinion—likely reflecting institutional differences in funding experiences. Item 22, which concerns the impact of inconsistent power supply, had a low standard deviation of 0.57, suggesting strong agreement among respondents that unreliable electricity significantly disrupts digital infrastructure and workflow. Similarly, Item 23, addressing the use of outdated digitalization software, recorded a low standard deviation of 0.62, also reflecting a broad consensus on the negative consequences for the management and dissemination of research output. In contrast, Item 24, which discusses the impact of copyright and submission-related issues, showed a high standard deviation of 0.99, indicating wide variability in perceptions—likely due to differing institutional policies, levels of legal awareness, or administrative procedures. Finally, Item 25, which deals with resistance to digital platforms, recorded a standard deviation of 0.81, pointing to notable variation in how respondents perceive this behavioural barrier. Overall, the standard deviation values in Table 4 reveal strong consensus on the technical and infrastructural challenges, but greater disagreement on legal and attitudinal issues, suggesting the need for clearer policies and more uniform staff engagement strategies across institutions.

**Table 6: Recommended Strategies**

S/N	Statement	SD	D	A	SA	Mean	STD
26	Invest in infrastructure for access and long-term preservation	1	0	58	79	3.56	0.54
27	Encourage international cooperation	1	1	76	60	3.41	0.55
28	Train researchers in copyright and metadata tools	2	3	58	75	3.49	0.62
29	Formulate and implement supportive policies	7	23	49	59	3.16	0.88
30	Advocate for higher submission and digital culture	15	17	39	67	3.14	1.01

**Key:** SD (Strongly Disagreed); D (Disagreed); A (Agreed); SA (Strongly Agreed); STD (Standard Deviation)

Based on Table 6, respondents strongly agreed on the necessity of investing in infrastructure for access and long-term preservation (Mean = 3.56, SD = 0.54), indicating a clear consensus on this foundational requirement for successful digitalization. A similar strong agreement was evident for recommending and encouraging international cooperation to facilitate digitalization efforts (Mean = 3.41, SD = 0.55), highlighting a shared understanding of the value of global collaboration for wider reach and visibility.

There was also overwhelming support for training researchers to enhance their copyright and metadata skills (Mean = 3.49), suggesting a recognized need for capacity building among the research community. The formulation of supportive policies for effective digitalization and dissemination also garnered agreement (Mean = 3.16), although the slightly higher standard deviation (0.88) indicated some variability in perspectives, possibly reflecting diverse institutional policy landscapes.

Advocating for higher submission and digital culture received a moderate mean (3.14) and the highest standard deviation (1.01), suggesting the most diverse opinions on this approach. This variability likely stems from differing levels of success and engagement with advocacy efforts across institutions.

In summary, the analysis of Table 6 reveals a strong consensus among respondents regarding the importance of technical and capacity-building strategies, specifically infrastructure investment, international cooperation, and researcher training. However, approaches related to policy development and

behavioral change, such as advocating for digital culture and policy implementation, exhibited more varied levels of agreement, potentially reflecting the complexities of institutional policies and engagement strategies.

## **Conclusion**

This study examined the implementation, challenges, staff competencies, and strategic solutions related to the digitalization and dissemination of research outputs in Nigerian university libraries, with a focus on the TERAS platform. The findings reveal that while TERAS has been moderately implemented across institutions, its effectiveness is undermined by infrastructural deficits, inadequate funding, inconsistent staff competencies, and weak institutional policies. Staff demonstrate relative confidence in basic digital skills, but gaps remain in metadata management, digital preservation, and copyright literacy. Despite these challenges, there is strong support for strategic investments in infrastructure, international cooperation, and researcher training to enhance the visibility and accessibility of research outputs.

## **Recommendations**

Based on the findings of this study, the following recommendations are made to improve the dissemination of theses through institutional repositories in Nigerian university libraries:

1. Infrastructure & Power Support – Invest in stable electricity, high-speed internet, and digital tools to enhance TERAS implementation.
2. Staff Training – Organize continuous workshops on metadata management, copyright, digital preservation, and repository systems.
3. Institutional Policies – Establish clear guidelines to promote TERAS usage, ensure compliance, and mandate timely thesis submissions.
4. Collaboration & Partnerships – Strengthen inter-university cooperation and seek international funding to improve digitalization efforts.

5. Funding Advocacy – Secure government and private funding to develop digital infrastructures, support research, and advance technical skills.

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