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## Examining Services for Enhancing Access to Online Academic Content in Ugandan Universities: A Case of Makerere University (Mak) and Kampala International University (KIU)

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Access to online academic content is critical for teaching, learning, and research in contemporary higher education. This study investigates the services provided to facilitate this access in Ugandan universities, using qualitative case studies of Makerere University and Kampala International University. Guided by an interpretivist paradigm, data were collected through interviews with librarians, ICT staff, lecturers, students, and national service providers (RENU, NITA-U), alongside observations and document review (N=30). Thematic analysis revealed that while universities provide a suite of globally recognised services, including institutional repositories, subscription databases, authentication systems, and information literacy training, their effectiveness is significantly hampered by systemic fragmentation and underutilisation. Key challenges include a disconnect between national infrastructure provision and institutional service integration, inconsistent user training, and low awareness among academic communities. The study concludes that Ugandan universities have successfully established the foundational technological layer for digital access. However, to maximise impact, a strategic shift is required. This entails institutionalising continuous digital literacy training, proactively embedding online content services into core academic workflows, and enhancing multi-stakeholder collaboration to bridge the gap between service provision and meaningful adoption. Recommendations are offered for university management, service departments, and national bodies to foster a more cohesive and inclusive digital academic ecosystem for enhancing access to online content.

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## INTRODUCTION

The digital transformation of higher education is a global imperative, fundamentally reshaping teaching, learning, and research (Abad-Segura et al., 2020; Lund, 2021). Central to this transformation is seamless access to online academic content, which has evolved from a luxury to a critical infrastructure for scholarly communication and knowledge production (Tenopir, 2012; Suber, 2019). The Fourth Industrial Revolution (4IR) further underscores this need, demanding that academic institutions foster digital literacy and provide equitable access to information to remain competitive and relevant (Ally & Wark, 2020; Xu et al., 2018). This global shift was starkly highlighted during the COVID-19 pandemic, which exposed and exacerbated the digital divide, making robust online content access services not just an academic advantage but an essential component of educational resilience (Ameen, 2021; Eynon & Malmberg, 2021).

In sub-Saharan Africa, universities are actively navigating this digital transition. They are adopting globally recognised service models such as institutional repositories, subscription-based databases, and digital libraries to bridge the information gap (Musoke, 2019; Mutula & Kalusopa, 2022; Ntlotlang, 2019). However, this adoption is often constrained by significant challenges, including limited financial resources, inadequate technological infrastructure, and persistent digital skill gaps among users and staff (Heeks, 2022; Kashefi et al., 2019). The concept of "adverse digital incorporation" (Heeks, 2022) is particularly relevant, suggesting that simply

providing access is insufficient. Services must be integrated, contextualised, and supported to be truly empowering rather than merely creating new forms of exclusion.

Within this regional context, Uganda presents a compelling case study. The Ugandan government has recognised the enabling role of Information and Communication Technology (ICT) through its national development plans (NPA, 2020; Ber, 2025) and has made strides in improving national broadband infrastructure through agencies like the National Information Technology Authority (NITA-U, 2020, 2021). Furthermore, the Research and Education Network of Uganda (RENU) provides a critical National Research and Education Network (NREN) backbone, offering services like eduroam to facilitate connectivity for the academic community (RENU, 2021; Fiore et al., 2023). Despite this improving macro-level infrastructure, the micro-level implementation within universities, how these digital infrastructures translate into effective, user-centric services, remains underexplored (Nakaziba & Ngulube, 2024b; Kiwelu et al., 2024).

At the institutional level, Ugandan university libraries are at the forefront of this service delivery, undergoing their own digital transformation journeys (Nakaziba & Ngulube, 2024a; Akullo & Nsibirwa, 2024). They are tasked with providing core services such as institutional repositories, e-database subscriptions, authentication systems (e.g., EZproxy), and information literacy training (Chanda, 2021; Eje & Dushu, 2018). Preliminary studies suggest that while these services exist,

their effectiveness is often hampered by fragmentation, inconsistent delivery, and low awareness among students and faculty, leading to significant underutilization of costly resources (Kiwelu et al., 2024).

This study, therefore, positions itself at the intersection of these global trends, national infrastructural developments, and institutional service delivery challenges. It focuses on two pivotal institutions in Uganda: Makerere University, the leading public university, and Kampala International University, a major private university.

### Objectives

- To guide the inquiry into how services facilitate access to online academic content at Makerere University and Kampala International University, the study is structured around the following specific objectives:
- To examine the services provided by Makerere University and Kampala International University for facilitating access to online academic content.
- To investigate the integration, consistency, and utilisation of these services
- To provide empirical evidence on the gap between technological provision and effective online content access in the Ugandan higher education landscape.

### LITERATURE REVIEW

This review synthesises existing scholarship on services for accessing online academic content, structured thematically from global models to the specific challenges and context of sub-Saharan Africa and Uganda. It culminates in identifying the critical gap this study aims to address.

#### Global Imperatives and Evolving Service Models

Globally, the digital transformation of higher education is an established paradigm, driven by the Fourth Industrial Revolution (4IR) and

accelerated by the COVID-19 pandemic (Abad-Segura et al., 2020; Lund, 2021). In this context, access to online content is no longer ancillary but fundamental to teaching, learning, and research. Universities in the global north have institutionalised a suite of services to facilitate this access. These include:

**Institutional Repositories and Digital Libraries:** These platforms are crucial for managing, preserving, and providing open access to institutional research outputs, thereby increasing the visibility and impact of university scholarship (European Commission, 2020; Chanda, 2021). They represent a shift towards open science and decentralised knowledge dissemination.

**Subscription-Based Electronic Resources:** Access to commercial e-journals, e-books, and bibliographic databases through subscriptions remains a cornerstone of academic library services (Tenopir, 2012). The effectiveness of these services, however, is increasingly linked to user-friendly authentication systems that enable remote access, reflecting a move towards seamless, "anytime, anywhere" learning (Jiahui et al., 2020).

**User Support and Digital Literacy Training:** The provision of technology is insufficient without corresponding user capability. Consequently, information literacy training, library orientations, and embedded librarian programmes are critical services designed to build user capacity to navigate, evaluate, and effectively utilise digital resources (Tenopir, 2012; Mattar et al., 2022). The goal is to foster digital inclusion, enabling the human capabilities necessary to leverage technology for development (Fisk et al., 2023).

#### The Adoption of Services for Facilitating Access to Online Content

In sub-Saharan Africa, universities are actively adopting these globally recognised service models, but their implementation is profoundly shaped by regional and institutional constraints. **Infrastructural and Resource Limitations:** Studies consistently highlight that African universities face significant hurdles, including unreliable

internet connectivity, high bandwidth costs, and limited funding for recurring database subscriptions (Mutula & Kalusopa, 2022; Kashefi et al., 2019). Initiatives like Research4Life (2020) have been instrumental in bridging the content gap, but challenges of awareness and consistent access persist.

**The Role of National Research and Education Networks (NRENs):** NRENs, such as UbuntuNet Alliance members, are pivotal in providing the foundational infrastructure. They offer cost-effective internet bandwidth, facilitate inter-institutional collaboration, and deploy services like eduroam for secure, roaming access (UbuntuNet Connect, 2016; Fiore et al., 2023). The success of university-level services is therefore often intertwined with the robustness of the NREN.

**Sustainability and Institutional Capacity:** Research by Musoke (2019) and others indicates that while universities launch digital repositories and subscribe to databases, they grapple with long-term sustainability. This includes not only financial sustainability but also the technical expertise to maintain systems and the institutional buy-in to mandate deposit, leading to underpopulated repositories (Ntlotlang, 2019).

### **The National Services Landscape**

Within East Africa, Uganda presents a dynamic yet challenging environment. National policies, such as the National Development Plan (NPA, 2020) and the work of NITA-U (2020), demonstrate a commitment to digital infrastructure development. The Research and Education Network of Uganda (RENU) provides a critical backbone for academia (RENU, 2021). Recent studies on Ugandan university libraries reveal a sector in transition. Research indicates that libraries are actively engaged in digital transformation, exploring technologies like linked data and investing in technology-related professional development for staff (Akullo & Nsibirwa, 2024; Nakaziba & Ngulube, 2024a). Furthermore, consortia like the Consortium of Uganda University Libraries (CUUL) have been

vital for pooled resource negotiation, a strategy that proved essential for sustaining access during the COVID-19 pandemic (Kiwelu et al., 2024).

However, a critical analysis of the literature reveals a consistent theme of fragmentation. Studies tend to focus on specific aspects, such as the status of digital infrastructure (Byamugisha & Basheka, 2016), the potential of a single technology (Akullo & Nsibirwa, 2024), or the general challenges of library transformation (Nakaziba & Ngulube, 2024b). While Mutula and Kalusopa (2022) and Musoke (2019) rightly identify budget and sustainability as overarching issues, there is a lack of granular, empirical evidence on how these challenges manifest in the actual delivery and experience of online content services.

### **Identified Research Gap**

The existing literature effectively establishes what services are being adopted by Ugandan universities (repositories, databases, etc.). However, a significant gap exists in understanding the holistic effectiveness of these services. There is a lack of systematic, multi-stakeholder investigation that simultaneously examines integration, consistency, and utilisation. This study fills this gap by employing a qualitative case study approach to investigate the services for enhancing access to online content at Makerere University and Kampala International University. It moves beyond a simple inventory of services to provide a critical analysis of their functionality, fragmentation, and ultimate value to the academic community, thereby offering evidence-based strategies for enhancement.

### **METHODOLOGY**

This study employed a qualitative research approach to develop a nuanced, in-depth understanding of the services for enhancing access to online content within their real-life contexts. The following sections detail the philosophical, design, and procedural choices that guided the investigation.

## Research Paradigm

The study was guided by the interpretivist paradigm. This paradigm is predicated on the understanding that social reality is subjective, multiple, and constructed through human interaction and meaning-making (Leavy, 2017). In the context of this research, interpretivism was appropriate because it allowed for the exploration of the diverse perspectives, experiences, and interpretations of the various stakeholders (librarians, ICT staff, lecturers, students) regarding the online access services. The goal was not to seek a single objective truth, but to understand the complex, situated realities of how these services are implemented, perceived, and utilised.

## Research Design

A qualitative case study design was adopted. A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Weyant, 2022). This design was ideally suited to this study for two key reasons: It allowed for an intensive, holistic examination of the "case" of online content services in Ugandan universities. It facilitated the use of multiple data sources to triangulate findings, thereby enhancing the validity and depth of the inquiry. The study focused on two instrumental cases: Makerere University (a leading public university) and Kampala International University (a major private university). This dual-case approach enabled a comparative element, illuminating how contextual factors like institutional type (public/private) might influence service delivery.

## Study Setting and Participant Selection

The study was conducted at Makerere University and Kampala International University (KIU) in Kampala, Uganda. These institutions were purposively selected because they represent prominent and structurally different models of higher education in Uganda, thereby offering insights that could be informative for a wide range of universities.

The study employed qualitative sampling logic; therefore, the sample sizes were not derived from a statistical formula but were based on methodological principles appropriate for exploratory, multi-stakeholder research. A total of  $N = 30$  participants was determined using a combination of purposive and snowball sampling, guided by the following considerations:

### Information Power and Theoretical Saturation:

The selection aimed to ensure that the participants collectively possessed sufficient information power to address the study objectives. Sampling continued until no new substantive insights were emerging within the stakeholder groups.

### Stakeholder Representation:

The categories of 12 university staff, 10 students, and 8 national stakeholders were set to achieve a balanced and meaningful representation of the ecosystem influencing access to online academic content.

University staff ( $n = 12$ ) included librarians, IT personnel and lecturers whose roles directly affect the provision, management, and pedagogical integration of online resources.

Students ( $n = 10$ ) represented the primary end-users, with diversity across programmes and study levels ensuring breadth of experience.

National stakeholders ( $n = 8$ ) comprised experts from RENU and NITA-U, whose policy and infrastructure mandates shape university-level access.

### Practical Accessibility of Key Informants:

As key decision-makers and technical personnel are limited in number, especially at national agencies, the sample sizes also reflect the actual population of eligible informants available for inclusion.

These methodological choices ensured that the sample was adequate, information-rich, and appropriate for a qualitative inquiry examining

institutional practices and user experiences in accessing online academic content.

### **Data Collection Methods and Instruments**

Data were collected over a three-month period (May, June, July 2024) using three complementary qualitative methods, allowing for methodological triangulation:

**Unstructured Interviews:** In-depth, conversational interviews were conducted with all participants using an interview guide. This format allowed for flexibility to probe emerging themes and explore unique stakeholder perspectives in detail. Interviews with institutional staff focused on service provision, challenges, and policies, while interviews with students and lecturers focused on awareness, usage patterns, and perceived barriers. All interviews were audio-recorded and transcribed verbatim.

**Participant Observation:** Systematic observations were conducted in key spaces where online access services are delivered. This included library computer labs, areas with Wi-Fi access, and help desks. An observation protocol was used to document factors such as user behaviour, signage about available services, computer functionality, and the general accessibility of ICT facilities. This method provided direct evidence of service utilisation and environmental constraints.

**Document Review:** A systematic review of relevant documents was undertaken to corroborate and contextualise the data from interviews and observations. Documents analysed included: Institutional websites and library portals. Strategic plans and ICT policy documents (where accessible). Annual reports from the library and ICT departments. Training manuals and promotional flyers for online resources. In addition, public reports from RENU and NITA-U were reviewed.

### **Data Analysis**

The data were analysed using thematic analysis following the six-phase framework by Braun and Clarke (2006): Immersing oneself in the data by reading and re-reading transcripts, field notes, and

documents. Systematically coding interesting features across the entire dataset. Collating codes into potential themes, gathering all data relevant to each potential theme. Checking if the themes work in relation to the coded extracts and the entire dataset, leading to the generation of a thematic map. Refining the specifics of each theme and the overall story that the analysis tells. Selecting vivid, compelling extract examples, final analysis of selected extracts, and relating the analysis back to the research question and literature.

### **Ethical Considerations**

Ethical approval was obtained from the Lira University ethics committee, and permission to conduct the study in Uganda was obtained from the National Council for Science and Technology. Prior to data collection, all participants provided written informed consent. They were informed about the study's purpose, their right to confidentiality and anonymity, and their freedom to withdraw at any time without penalty. Data were stored securely, and identifying information was removed from transcripts and the final report to protect participant privacy.

### **Rigour and Trustworthiness**

To ensure the rigour of the study, several strategies were employed as outlined by Leavy (2017) and Maher et al. (2018): Using multiple data sources (stakeholders) and methods (interviews, observation, documents) to cross-verify findings (triangulation). Preliminary findings were shared with a subset of participants to check for accuracy and resonance with their experiences. Detailed descriptions of the context and findings are provided to allow readers to assess the transferability of the results. A clear record of the research process, from data collection to analysis, was maintained to demonstrate the decision-making process.

## **FINDINGS**

The investigation into services for enhancing access to online academic content in Ugandan universities reveals a landscape characterised by a

robust foundational infrastructure supported by national digital frameworks, yet constrained by persistent operational and human capacity limitations. For confidentiality, codes were assigned as follows: MAKSF (Makerere University staff), MAKST (Makerere University students), KIUSF (KIU staff), and KIUST (KIU students); and Key informants - RENU (RENU staff), NITASF (NITA-U staff). The findings are presented under four interrelated thematic areas

that capture the institutional and systemic realities of digital service provision in Ugandan Universities. The key services currently facilitating access to online content in Uganda Universities are summarised in Table 1 below. These reflect not only technical investments but also targeted interventions in capacity building, system resilience, and institutional digital transformation.

**Table 1: Summary of Key Services for Facilitating Access to Online Content**

Service/Resource	Description	Institutions
<b>Internet Connectivity</b>	4G internet access via LAN, WLAN, and broadband services.	RENU, NITA-U, MAK, KIU
<b>Digital Libraries</b>	Access to e-books, online journals, and databases.	MAK, KIU
<b>Online Learning Platforms</b>	Learning Management Systems (LMS) for course materials and assignments.	MAK, KIU
<b>IT Support Services</b>	Technical assistance for internet access and troubleshooting.	RENU, NITA-U, MAK, KIU
<b>Computer Labs and Standby Generators</b>	Availability of computer facilities for accessing online content and standby generators.	MAK, KIU
<b>Wi-Fi Hotspots</b>	Campus-wide Wi-Fi coverage for student and staff use.	MAK, KIU
<b>E-Resources Training</b>	Workshops and training sessions on utilising digital resources effectively.	MAK, KIU
<b>Cloud Storage</b>	Storage solutions for accessing and sharing educational content.	MAK, KIU, RENU, NITA-U

**Source:** *Primary data*

Table 1 above highlights a deliberate effort by institutions to advance services for enhancing access to online content and attempting to bridge the digital divide. The services are designed to support infrastructure provision, inclusivity, and multi-stakeholder engagement. It reflects a practical integration of national connectivity initiatives with university-level digital enablement. Below is the detailed presentation of findings related to services for enhancing access to online content in Ugandan Universities.

### **National Framework for Digital Enablement**

A central finding of this study is the existence of a synergistic national framework that underpins the digital transformation of higher education in Uganda. This framework is sustained through the complementary roles of key national service institutions, namely, the Research and Education

Network for Uganda (RENU) and the National Information Technology Authority–Uganda (NITA-U). The former provides dedicated academic infrastructure through federated internet access (such as eduroam), bandwidth aggregation, cloud services, and research collaboration platforms; while the latter ensures national ICT policy coordination, public sector connectivity through the National Backbone Infrastructure (NBI), and regulatory oversight. The significance of this partnership was articulated by a national service provider key informant who explained, “*We receive support in terms of last-mile fibre optic connectivity to reach underserved communities... To minimise the digital divide, we must continue focusing on inclusion and partnerships.*” (RENU 2). This revelation illustrates how national-level connectivity strategies are designed to extend the benefits of

digital infrastructure beyond urban and elite institutions. The emphasis on inclusion and partnerships resonates with global digital equity discourse, positioning Uganda's higher education network within the broader framework of socio-technical integration. Institutional perspectives further reinforced this view. For instance, a student revealed, *"These national bodies are crucial in providing the necessary infrastructure, funding, and support to bridge the digital divide."* (KIUST 5). This statement captures how end-users perceive national agencies as enablers of academic participation in the digital knowledge economy. The documentary review of reports from both agencies (RENU Annual Report 2021 and NITA-U Annual Report 2019) corroborated these sentiments, revealing an explicit institutional commitment to academic connectivity and capacity-building initiatives. Collectively, these findings suggest that Uganda possesses an enabling policy and infrastructural ecosystem, which, if fully harnessed, can serve as a transformative foundation for equitable digital access to online content in higher education.

### **Established Institutional Services with Global Parity**

Another key finding indicates that universities have developed a core suite of digital services that align closely with international best practices in academic information management. These services fall within four functional domains: connectivity and access, digital content platforms, academic systems, and user support. At the connectivity level, both Makerere University and Kampala International University offer 4G Local Area Networks (LANs) and campus-wide Wi-Fi, supported by standby power systems to mitigate outages. Documented observations confirmed their availability and that these provisions serve as critical enablers of digital learning and research continuity.

Regarding digital content provision, the institutions maintain subscription-based access to major scholarly databases such as EBSCOhost, JSTOR, and SpringerLink, complemented by institutional repositories hosting theses,

dissertations, and faculty publications. For instance, a staff member from KIU explained, *"Our institutional repository houses research papers and dissertations... It is a critical resource for our visibility and enhances access to online local content for our learners."* (KIUSF 1). This revelation reflects a growing culture of digital scholarship and open access dissemination, which aligns with global trends toward institutional knowledge visibility. However, synthesis of responses suggests that while these services exist, their accessibility and consistent utilisation remain uneven, particularly among undergraduate users.

The study also established that Learning Management Systems (LMS) serve as central nodes for academic engagement. For instance, a staff member from Mak revealed, *"Our LMS allows students to access course materials, submit assignments, and engage in discussions."* (MAKSF 3). Such systems represent a tangible alignment with international pedagogical innovation; yet the level of integration across departments varies widely. Complementary services, including cloud storage and remote collaboration tools, were also available but underutilised. Both universities (Mak and KIU) provide IT support and periodic training sessions on using electronic resources. The synergy with national service providers was underscored by an ICT staff member who revealed, *"Our University relies on the bandwidth and authentication systems provided by RENU. This helps ensure that the connection is reliable and meets national quality standards."* (KIUSF 3). This demonstrates the embeddedness of institutional systems within the broader national digital framework, a relationship that is both functional and strategic in ensuring academic service reliability.

### **Operational Fragmentation and the Disintegrated User Experience**

Despite these achievements, the study uncovered a pervasive challenge of operational fragmentation, which manifests as a disjointed user experience across institutional digital platforms. The multiplicity of systems that

includes LMS, library portals, authentication platforms, and institutional repositories operates largely as independent silos with limited interoperability. For instance, a student from KIU described the resulting effect as, *“To find a journal article, I might have to check the LMS for readings, then go to the library portal separately, and if that fails, search Google Scholar. There is no single starting point.”* (KIUST 3). This revelation captures the absence of an integrated digital ecosystem, resulting in duplication of effort and loss of time. From an institutional standpoint, this fragmentation signifies a mismatch between technological investment and functional coherence, where the absence of a unified access gateway undermines the user experience.

Moreover, a divergence between institutional policy and academic practice was observed. While repositories are championed as primary outlets for institutional research visibility, many academics continue to rely on commercial and global academic networking platforms such as ResearchGate or Academia.edu. The convenience and visibility of these platforms appear to outweigh institutional loyalty, revealing a latent gap in institutional engagement strategy and digital identity management. Collectively, these findings suggest that the absence of interoperability and coherent user pathways represents not merely a technical problem but also a managerial and behavioural challenge that impedes the full exploitation of digital services.

### **The Capacity Gap in User Training and Awareness**

Perhaps the most consequential finding is the inadequate user training and low awareness levels regarding available digital services. The study revealed that most universities conduct only introductory information literacy sessions at the start of academic programmes, leaving users ill-equipped to navigate complex research databases and specialised digital tools. For instance, a student at Mak explained, *“I only really learned to use the databases when I was desperate for my thesis... and that was through YouTube and*

*friends.”* (MAKST 4). This revelation illustrates a widespread pattern of informal learning and self-reliance that substitutes for institutional guidance. Such practices, while resourceful, signify systemic inadequacy in structured capacity-building programmes. Librarians and ICT officers corroborated this perspective. One librarian revealed, *“We conduct training for just three people who show up, while hundreds are struggling with their research.”* (MAKSF 2). This underscores a fundamental disconnect between service provision and user engagement, exacerbated by limited promotion and user outreach. Awareness campaigns were found to rely predominantly on traditional channels, notice boards, emails, and static web postings, which fail to reach the digitally mobile student population. A national service key informant summarised the issue, stating that infrastructure alone cannot achieve digital inclusion without deliberate investment in *“the soft skills of user education.”* NITAST 1. This insight highlights the interdependence between technical provision and human capability, suggesting that the sustainability of Uganda’s digital academic ecosystem will depend heavily on continuous capacity development and inclusive awareness strategies.

Findings reveal that Uganda’s higher education sector has achieved substantial progress in establishing digital infrastructure and services that meet international standards, yet systemic fragmentation and capacity shortfalls continue to constrain their transformative impact. The existence of an enabling national framework provides a solid foundation, but without coherent integration and continuous user empowerment, the full potential of these investments remains unrealised.

### **DISCUSSION**

This study set out to investigate the services for enhancing access to online academic content in Ugandan universities. The findings paint a picture of a digital ecosystem with a strong foundational infrastructure, yet one whose transformative potential is curtailed by significant operational

and human-capacity constraints. This situation reflects a critical phase in the digital transformation of higher education in the Global South, where the challenge is shifting from technological acquisition to effective institutionalisation and adoption (Heeks, 2022; Nakaziba & Ngulube, 2024b).

The existence of a robust national framework, characterised by the synergistic partnership between the national research and education network (RENU) and the national IT authority (NITA-U), is a significant enabling factor. This finding aligns with global literature that emphasises the importance of National Research and Education Networks (NRENs) as critical infrastructure for academic collaboration and digital enablement (Fiore et al., 2023; UbuntuNet Connect, 2016). The complementary roles, where one body provides specialised academic services and the other ensures regulatory compliance and national backbone access, create a cohesive environment that mitigates the infrastructural deficits often highlighted in studies on African universities (Mutula & Kalusopa, 2022; Kashafi et al., 2019). This synergy demonstrates a strategic, multi-level approach to digital governance that is essential for sustainable development in resource-constrained contexts.

At the institutional level, Ugandan universities have successfully established a suite of services that demonstrates surface-level parity with global models. The provision of institutional repositories, subscription databases, Learning Management Systems, and campus-wide Wi-Fi shows a clear response to the global imperative for digitised higher education (Abad-Segura et al., 2020; Lund, 2021). This finding confirms earlier observations that Ugandan academic libraries are actively engaged in digital transformation (Nakaziba & Ngulube, 2024a). However, the mere presence of these technologies is not synonymous with their effective integration into the scholarly life of the university.

This is where the study uncovers its most critical insights. The operational fragmentation of services, where LMS, library portals, and

repositories operate as disconnected silos, creates a significant barrier to adoption. This fragmentation exemplifies what Heeks (2022) terms "adverse digital incorporation," where the presence of technology fails to deliver its intended benefits due to poor integration and contextual misalignment. The finding that academics often bypass institutional repositories for global platforms like ResearchGate is a powerful illustration of this; it suggests that the institutional tools, while available, lack the compatibility and ease of use required for seamless adoption, a key tenet of Rogers' (1983) Diffusion of Innovations (DOI) theory. The complexity of navigating multiple systems diminishes their relative advantage from a user's perspective.

Furthermore, the critical capacity gap in user training and awareness emerges as a central impediment. The provision of sporadic, introductory-level training is insufficient to foster the digital literacy necessary for navigating complex scholarly databases. This finding strongly resonates with the work of Fisk et al. (2023) on digital inclusion, which argues that technology must be coupled with the development of human capabilities. The reliance of students on peer networks and informal channels like YouTube to build research skills underscores a systemic failure to institutionalise digital competence, a challenge also identified in broader educational frameworks (Mattar et al., 2022). This training gap, identified by national stakeholders as a sector-wide issue, represents the most significant bottleneck between service provision and meaningful utilisation.

Analysing these findings through the Technology-Organization-Environment (TOE) Framework (Tornatzky & Fleischer, 1990) provides a holistic explanation. The Technological context is well-established, and the Environmental context is supported by a synergistic national framework. However, the organisational context within universities presents the primary hurdle. The misalignment between strategic digital goals and operational execution, evidenced by inadequate funding for continuous training, lack of proactive

promotion, and the failure to create a unified user experience, stifles adoption. This aligns with recent studies emphasising that the success of digital transformation in Ugandan libraries is contingent on institutional commitment and strategic professional development (Nakaziba & Ngulube, 2024b).

The journey toward effective online content access in Ugandan universities is at a crossroads. The foundational technological and national policy layers are firmly in place. The primary challenge is now organisational and cultural: to transition from maintaining islands of digital provision to building an integrated ecosystem that prioritises user experience, embeds digital literacy into the core curriculum, and strategically aligns all services to support the academic mission. Without this strategic shift, the risk of adverse incorporation remains high, and the substantial investments in digital infrastructure will continue to yield suboptimal returns.

## CONCLUSION

This study concludes that Ugandan universities stand at a critical juncture in their digital transformation journey. They have successfully established a robust foundation for accessing online academic content, evidenced by the deployment of institutional repositories, subscription databases, learning management systems, and the underlying support of a synergistic national infrastructure involving RENU and NITA-U. However, this technological provision has not fully translated into transformative academic practice. The potential of these services is significantly undermined by a triad of critical challenges: the operational fragmentation of systems, a pronounced capacity gap in user skills and awareness, and a strategic misalignment that prevents the seamless embedding of these tools into teaching, learning, and research workflows.

The central paradox identified is one of robust infrastructure facing constrained utilisation. While the Technological and Environmental contexts, as explained by the TOE framework, are

increasingly enabling, the organisational context within universities remains the primary bottleneck. The findings demonstrate that without a deliberate strategic shift from simply providing digital services to actively fostering their integration and adoption, the risk of "adverse digital incorporation" remains high. The investments in digital infrastructure will continue to yield suboptimal returns, and the digital divide will persist not as a matter of access, but as a matter of effective use.

## Recommendations

To bridge the gap between potential and performance, the following targeted recommendations are proposed for key stakeholders.

**Mandate and Resource Integrated Digital Literacy:** Move beyond ad-hoc training. Institutionalise a compulsory, for-credit digital and information literacy course for all undergraduates, with advanced, discipline-specific workshops for postgraduates and faculty. This should be a cross-departmental initiative funded from central university budgets.

**Adopt Proactive and User-Centric Promotion:** Shift communication strategies from passive (library websites, noticeboards) to active and targeted outreach. Utilise channels frequented by students, such as university-wide mobile messaging platforms (e.g., WhatsApp), social media, and faculty meetings, to run awareness campaigns about specific databases and services.

**Develop Embedded and Just-in-Time Support Models:** Transition from one-off orientations to embedded support. Librarians should offer research support sessions within specific departments and provide "just-in-time" learning resources (e.g., short video tutorials, curated guides) directly within relevant LMS course modules.

**Strengthen Consortia Agreements with Capacity-Building Components:** Leverage national consortia's bargaining power not only to secure affordable database subscriptions but also to

negotiate for mandatory, recurrent training from database vendors for university librarians and staff, thereby building sustainable local training capacity.

The study anticipates that, by adopting the multi-level recommendations presented above, Ugandan universities can evolve their digital ecosystems from being repositories of potential to becoming powerful, integrated, and indispensable engines of academic excellence and innovation. The focus must now pivot from building the digital infrastructure to nurturing the digital culture that allows it to thrive.

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