DIGITAL CAPACITY AND CONSORTIUM PARTICIPATION: AN EMPIRICAL ANALYSIS OF POLYTECHNIC LIBRARIES IN NIGERIA

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Abstract
This study explores the relationship between digital capacity and membership in consortium by Nigeria's polytechnic libraries with a perspective of evaluating their readiness for collaborative engagement in a digitally evolving information environment. The study is motivated by four broad objectives, which involve the evaluation of digital infrastructure, digital literacy among personnel, institutional facilitators, and existing levels of consortium membership. Through a mixed-methods design, the information was collected using semi-structured interviews with primary stakeholders including polytechnic *librarian, heads/staff of ICT units, acquisition/collection development librarian and cataloguing/technical services librarian. The results were explored thematically to elicit challenges and strategic drivers. Evidence suggests that a majority of polytechnic libraries have achieved baseline ICT deployment i.e., internet connection and library management systems while gaps still exist in the development of staff capacity, funding, and policy environments that limit effective membership within consortia. The study concludes by calling for targeted policy interventions, digital skill acquisition, and enhanced institutional cooperation to improve the readiness of polytechnic libraries to function effectively in library consortia in the long run. This research contributes empirical information to digital information literacy and interlibrary network cooperation in developing worlds.*

Keywords: *consortium participation, digital capacity, ICT infrastructure, ICT readiness, polytechnic libraries.*

Introduction

The evolving landscape of academic libraries has increasingly depicted the need for digital innovation and collective resource sharing. To this end, digital capacity and consortium building have emerged to serve as key variables determining the effectiveness and sustainability of library services. Digital capacity is a term that refers to the ability of a library to utilize and manage digital tools, infrastructure, and professional personnel to provide useful information services. These include access to stable internet, digital platforms, and ICT-capable personnel. Consortium building, however, involves cooperative collaborations among libraries in order to consolidate electronic content, hold subscription fees, and enhance access to scholarly literature. In the modern shifting educational environment, digital capability has become imperative to shape the way libraries support research, provide access to information, and drive academic excellence. This is particularly so in the case of Nigerian polytechnic libraries, which are intellectual centers for technical and vocational learning. With dwindling limited resources, financial constraints, and rising user expectations, such libraries are considering collaborative programs such as library consortia agreements where libraries cooperate to share resources, infrastructure, and skills for improved delivery of services and cost benefits. Though the concept of library consortia is not new, its application has become pertinent in Nigeria's emerging context. Academics such as Gbaje and Alhassan (2020) identify the benefits of collaborative digitization, shared subscriptions, and technical support among member libraries. Success, however, in consortia of this nature relies largely on digital preparedness, including access to current ICT infrastructure, skilled personnel, and supporting institutional policies (Olanrewaju & Eze, 2022). In their absence, efforts toward joining or sustaining consortia will prove in vain.

Research shows that polytechnic libraries fall behind university libraries in terms of digital innovation. According to Oladokun (2021), they are mostly founded on outdated technologies and are not exposed to digital content. Onuoha and Oyewole (2023) found disparities in digital capability across regions and institutions create a lopsided library system in which only rich libraries can effectively participate in consortia. In addition, most polytechnics have no ICT policies and sufficient government funding, with personnel frequently missing out on digital literacy training, further lowering institutional readiness (Nwankwo & Igbinovia, 2021; Bello & Ijagbemi, 2022). However, there are positive signs ahead. Initiatives by the National Board for Technical Education (NBTE) and support from donor agencies signal growing emphasis on ICT integration and staff training. These trends underscore the need to assess the digital capability of Nigerian polytechnic libraries and its implications for consortium readiness. This research thus explores the infrastructural, human, and policy dimensions of digital preparedness, identifies existing challenges, and explores potential strategies for strengthening collaborative resource sharing among polytechnic libraries.

Objectives of the Study

These objectives are intended to guide both the theoretical argument and any supporting empirical data gathering:

1. to assess the level of digital infrastructure and technical readiness in Nigerian polytechnic libraries for consortium participation;
2. to evaluate the extent to which polytechnic libraries in Nigeria currently engage in library consortia;

3. to identify the barriers and enablers affecting effective consortium participation among polytechnic libraries;
4. to examine the relationship between digital capacity and successful consortium collaboration in Nigerian polytechnic libraries.

Statement of the Problem

Nigeria polytechnic libraries are at the heart of technical and vocation education but most of them lack the capacity to fully exploit digital technology. This holds back their preparedness to participate in library consortia, which are primary avenues for resource sharing and improved service delivery. Their potential for membership in library consortia is always diminished by bad digital capacity in ICT infrastructure, poor ICT capability among personnel, and bad institutional policies in support of digital operations. There is available literature that identifies a number of critical issues that are limiting the digital readiness of polytechnic libraries. For instance, studies have indicated that the majority of polytechnic libraries have inadequate or outdated digital infrastructure, while others have not fully trained personnel who can manage digital resources and integrated library systems. Furthermore, the absence of clear ICT adoption and membership consortium policy discourages collaborative efforts. All these problems are collectively responsible for the failure of the majority of polytechnic libraries to meet users' requirements for timely, accessible and quality information services.

Conceptual and Theoretical Framework

The conceptual foundation of this study is based on established theoretical frameworks explaining technology adoption, resource utilization, and innovation diffusion, which are instrumental in explaining the dynamics of digital capacity and consortium involvement by Nigerian polytechnic libraries. Specifically, the study draws on the Technology Acceptance Model

(TAM), the Resource-Based View (RBV), and the Diffusion of Innovation Theory (DOI) to provide a composite framework through which consortium building readiness can be explained. The Technology Acceptance Model (TAM), developed by Davis (1989), is among the most influential models for describing individuals' and organizations' adoption and use of new technologies. Perceived usefulness and perceived ease of use are significant determinants of technology adoption, according to TAM. In the context of polytechnic libraries, TAM helps to describe how the attitudes of library staff towards information technology, such as integrated library systems and digital repositories, influence their intention and willingness to engage in consortium activities. Existing studies validate the relevance of TAM in libraries; for example, Ahmed, Khan and Hassan (2021) point out that, positive attitudes towards technology significantly enhance librarians' utilization of digital platforms, which is essential for successful consortium participation.

Supplementing TAM, the Resource-Based View (RBV) theory focuses on the internal capabilities and resources that organizations must possess to achieve competitive advantage and successful collaboration (Barney, 1991). In consortium building among polytechnic libraries, RBV brings to fore the tangible and intangible assets in polytechnic libraries ICT infrastructure, qualified manpower, and institutional policies that underpin their ability to contribute to and benefit from resource sharing consortia. Libraries with stronger internal digital infrastructure and human capacity, Eze and Okoro (2022) state, are more likely to sustain consortium partnerships and innovate in service delivery. Moreover, Diffusion of Innovation Theory (DOI), conceived by Rogers (2003), describes how new ideas and technology spread within and among organizations over a span of time. DOI highlights innovation characteristics, communication channels, time, and social systems that affect the rate and extent of adoption.

Mapping DOI on polytechnic libraries indicates how consortium membership can be understood as an innovation that is liable to gradual adoption through the influence of peer networks and institutional culture. Onah and Onwuka (2020) argue that the diffusion process must be highlighted so that measures can be taken to overcome resistance and accelerate consortium readiness among Nigerian academic libraries. The three theories, together, provide a robust conceptual framework to examine the multi faceted influences on digital capacity and consortium membership in Nigerian polytechnic libraries. TAM addresses individual adoption of technology, RBV stresses the importance of organizational resources, and DOI outlines the overall process of innovation adoption each contributing valuable understanding to diagnose the issue and recommend workable solutions.

Review of Related Literature

ICT infrastructure is the central support for the effective operation and computerization of Nigerian polytechnic libraries. ICT infrastructure encompasses various technological components such as internet connectivity, computer hardware, automation software, Integrated Library Systems (ILS), digital repositories, and electronic resource access all essential for the facilitation of digital services and membership in a consortium. Internet Connectivity is a perennial issue in Nigerian polytechnic libraries. Despite outstanding technological advancements in internet technology worldwide, poor and slow internet connectivity is a plight common to most Nigerian polytechnic libraries. Okiki and Adebayo (2021) argue that poor internet connectivity seriously inhibits access to online databases and e-resources and, thereby, limits the ability of such libraries to offer remote services or participate effectively in digital consortia. Similarly, Adeyemi and Afolabi (2020) note that internet unreliability affects not only user access but also the potential of the library staff to perform key digital processes such as cataloging and interlibrary loan requests.

Examining Computer Hardware, several studies affirm that polytechnic libraries are typically inhibited by outdated or inadequate hardware. Eze and Chukwuma (2022) found that the majority of libraries operate with outdated computers that cannot efficiently support modern software applications, hence disrupting the delivery of services and stalling digital transformation efforts. Bello and Ijagbemi (2022) reiterate that insufficient workstations affect the productivity of employees and user engagement with digital library services, making the library incapable of adapting to increasing ICT requirements. Another important piece of ICT infrastructure is the adoption of Automation Tools. Automation offers effective library procedures, reduces man made errors, and optimizes the effectiveness of the service. However, Ugwu and Okonkwo (2023) report that while some libraries in Nigerian polytechnics make use of user-friendly automated cataloging and circulation software, most lack automation processes. Sporadic application is often because funding is not forthcoming and technical capability is poor, which denies the libraries full integration of digital frameworks.

A study by Nwosu and Eze (2022) indicates that digital repositories are not maximally developed and poorly organized in the majority of Nigerian polytechnic libraries and thus with low accessibility and usability. Furthermore, access to e-resources such as scholarly journals, e-books, and databases is restricted by subscription costs and unstable internet connectivity (Adewale & Okeke, 2020). This restriction severely inhibits the ability of polytechnic libraries to meet their users' research needs and carry out extensive scale consortium based resource sharing. Finally, the literature provides that Nigerian polytechnic libraries are plagued by tremendous ICT infrastructure challenges, including bad internet connections, outdated and inappropriate computer hardware, minimal use of automation software, minimal usage of integrated library systems, and weakly developed digital repositories with few e-resource interfaces. All of these infrastructural

deficits have to be put in place for library services, consortium participation, and academic achievements to become a reality.

A research carried out by Eze and Chukwuma (2022) found that some Nigerian polytechnic library staff has begun acquiring middle level skills through on the job training, but there remain gaps in their application at full capacity. The study underscored the fact that middle level skills enable staff to contribute heavily to digital resource sharing and consortium activities. Advanced ICT abilities include advanced skills in programming, database administration, digital preservation, and advanced problem solving. Advanced ICT abilities grant library staff members the skills necessary to create, modify, and maintain digital infrastructure. Bello and Ijagbemi (2023) argue that advanced ICT abilities are lacking in Nigerian library workers due to lack of suitable formal training experiences and the absence of institutional support. This deficiency in accessibility restrains libraries from being able to innovate and join a consortium which need of high levels of digital competency.

Research Methodology

Mixed-methods design was the research design employed in this research, where both qualitative and quantitative data collection methods were integrated to have a comprehensive description of the research problem. The use of the mixed-methods design allowed the researchers to triangulate findings from different sources, thereby rendering the findings more robust and increasing the validity of the study. Semi-structured interviews were used as the primary instrument for qualitative data collection. The total enumeration sampling technique was used for sample selection.

The interviews were conducted on key stakeholders who have firsthand experience and knowledge of digital capacity and consortium stakeholders in selected Nigerian federal and state

polytechnic libraries in Southwestern, Nigeria. The study population comprised Polytechnic Librarians, Heads/Staff of ICT Units, Acquisition/Collection Development Librarians, and Cataloguing/Technical Services Librarians in selected federal and state polytechnic institutions. The number of stakeholders who made up the population as of the time the study was conducted was eighty (80).

Table 1: Study sample

S/N	**Polytechnics**	Polytechnic Librarian	Heads/ Staff of ICT Units	Acquisition/Collection Development Librarian	Cataloguing/ Technical Services Librarian	Total
Selected Federal Polytechnics Southwest, Nigeria						
1	The Federal Polytechnic, Ado-Ekiti, Ekiti State	1	3	2	2	8
2	The Federal Polytechnic, Ede, Osun State	1	3	2	2	8
3	The Federal Polytechnic, Ilaro, Ogun State	1	3	2	2	8
4	The Federal Polytechnic, Ibadan, Oyo State	1	3	2	2	8
5	Yaba College of Technology, Lagos State	1	3	2	2	8
Selected State Polytechnics in Southwest, Nigeria						
6	Adeseun Ogundoyin Polytechnic, Eruwa	1	3	2	2	8
7	Ekiti State College of Agriculture and Technology, Isan-Ekiti	1	3	2	2	8
8	Moshood Abiola Polytechnic, Abeokuta	1	3	2	2	8
9	Osun State College of Technology, Esa-Oke	1	3	2	2	8
10	Rufus Giwa Polytechnic, Owo	1	3	2	2	8
TOTAL						**80**

Source: federal and state polytechnics, Southwest, Nigeria

Data Analysis

Table 2: Interview Questions, Response Analysis and Thematic Insight

S/N	Interview Questions	Response Analysis	Thematic Insight
	Could you tell me about the common digital infrastructure in your library?	85% of the respondents reported basic ICT equipment such as computers, internet, and KOHA software. This notwithstanding, there is still underutilization caused by poor maintenance, unstable power supply, and limited bandwidth. Federal polytechnics fared better than their state equivalents.	There is a digital imbalance across institutions' readiness is uneven and insufficient for consortium level activity.
	Has your library participated in any consortium project or digital resource sharing scheme? If yes, how?	45% of the respondents affirmed that not many libraries (mainly federal) had participated in such consortium projects as TetFund or NLA resource sharing. Passive participation was common. 48 % of the respondents from state polytechnics reported nil or negligible involvement.	Limited participation is largely due to lack of awareness, unclear procedures, or absence of formal invitation/coordinating processes.
	What are the largest barriers your organization faces to being part of a library consortium?	90% of the respondents stated that, the most pressing obstacles are limited funding, poor ICT infrastructure, insufficient institutional policies, and absence of a national coordination structure or easily accessible database for consortia.	Systemic and institutional barriers deny full participation in cooperative resource sharing networks.
	Does your institution possess a digital development policy or strategic plan in favor of consortium membership or digital resource sharing? Yes/No	The study confirmed that both federal and state polytechnics lacks these policies according to 90% of respondent's responses. Where these policies exist, they are not current or are not relevant to current digital realities.	There is an institutional level policy vacuum that operates to exacerbate fragmentation and underutilization of digital consortia.
	What types of staff training or digital literacy programs are in place to prepare your librarians for consortium membership?	30% of the respondents reported that, they lack regular digital training. The majority of training is self-sponsored or externally sponsored by NLA or donors. Organized and regular training is not forthcoming.	There is an evident training gap that limits effective staff participation in digital collaboration activities.

	What in your view can be done to enhance the digital capacity of polytechnic libraries for meaningful consortium involvement?	95% of the respondents recommend as follows: - National policy coordination - Greater investment in ICT - Periodic digital training - Establishing a Polytechnic Library Consortium - Regulatory support from NBTE	There is keen stakeholder interest in consortium development, yet institutional and systemic support needs to be in place and continued.

Table 2 indicates the interview questions posed to respondents of selected federal and state polytechnic libraries, with a step by step breakdown of their responses and the resulting thematic findings derived from the data. The table presents an organised understanding of how key issues such as digital infrastructure, consortium participation, institutional concerns, policy guidelines, staff training, and stakeholder recommendations emerged from qualitative interviews. It uncovers the depth of digital preparedness and points to institutional barriers and areas of collective activity in the Nigerian polytechnic library system.

TABLE 3 Summary of Emergent Themes from Interview Responses

Theme	Frequency of Responses	Observation
Digital Readiness	85%	Varies across institutions; generally low in state polytechnics
Participation in Consortia	45%	Sparse and inconsistent; more common in federal institutions
Key Barriers	90%	Funding, lack of policy, limited digital literacy, weak national coordination
Policy and Institutional Frameworks	90%	Mostly outdated or non-existent
Capacity Building	30%	Infrequent and inadequate training programs
Strategic Recommendations	95%	Strong demand for funding, national coordination, policies and training

Table 3 synthesizes the resultant themes as gathered from the responses of the interviews. The themes are inherent issues continually brought forward by the respondents and provide a conceptual framework to guide further analysis and discussion. The table summarises the broad

trends, such as digital imbalance, loopholes in policies, limited staff capacity and stakeholder engagement, which collectively dictate the readiness of polytechnic libraries to engage in consortia and digital collaborative initiatives.

Discussion of findings

The study finds that 85% of the survey respondents validated that digital readiness is institution-specific and is low for state polytechnics, which indicates considerable differences in digital infrastructure and capability that can hinder meaningful engagement in consortia. The findings from the research show a wide digital divide across Nigerian polytechnic libraries, with stark disparities in infrastructure and technologically preparedness that limit consortium level activity. Federal polytechnics were much better endowed with stronger internet connection, functioning library management information systems, and computer facilities. State-owned polytechnics lag behind with fewer ICT assets and limited access to vital digital resources. Such observations are supported by Nzewi (2021) who reported that while polytechnic libraries in Southeast Nigeria possessed some ICT infrastructure, usage of these resources was minimal, reflecting poor usage and infrastructure. Similarly, Adebisi (2009) study of federal polytechnic libraries in Southwest Nigeria reflected high ICT facility awareness but a near absence of viable digital resource sharing activities due to infrastructure and system limitations. Together, these studies substantiate our observation that the uneven provision of digital resources within institutions renders most polytechnic libraries unprepared for active participation in library consortia.

The study revealed that 45% of the participants reported infrequent and irregular visits by state polytechnics to consortia due to lack of awareness, unclear procedures, or absence of formal invitation/coordinating processes was consistent with findings presented in earlier research. Omeluzor and Akibu (2019) concluded that although some Nigerian polytechnic libraries engaged in resource sharing, full participation in consortia was limited and largely informal. They noted that such partnerships become more systematic and effective in federal institutions due to enhanced funding and administrative support. Similarly, Aina (2021) noted that state libraries do not have the infrastructure and governance capacity to participate actively within resource consortia, which reflects the gap between federal and state institutions in partnership participation.

The finding from the research revealed that 90% of the participants listed inadequate financing, weak institutional policy, low digital literacy, and ineffective national coordination as

major consortium participation barriers is adequately justified by the literature. Bello and Adepegba (2023) observed that public and academic libraries in Nigeria operate on limited budgets that hinder their ability to innovate digitally or engage in collaborations. Okiki and Asiru (2020) further observed that most library staff are not professionally trained in digital literacy and therefore are limited from being effective users of digital tools. UNESCO (2025) further underscored the imperative of national coordination in creating universalized digital infrastructures for educational settings and argued that the absence of the same generally leads to fragmented and inefficient implementation initiatives. The study found that 90% of institutions lack up-to-date policies to direct digital initiatives and membership in a consortium is in line with the findings of Uhegbu and Nwokocha (2022), who noted that policy statements in the majority of Nigerian academic libraries are either out of date or non-existent. These out-of-date policies cannot direct digital scholarship as it is today but instead stifle the strategic growth of library services. Good Things Foundation (2023) also pointed out that the lack of effective and up-to-date institutional policies is a major stumbling block to efficient deployment of digital inclusion strategies, especially in under-resourced institutions.

The evidence that only 30% of those surveyed had been provided with regular or adequate training shows the long-standing pattern of underinvestment in the development of library staff and enablers affecting effective consortium participation among polytechnic libraries. Okiki and Asiru (2020) added that capacity development of academic libraries is often ad hoc, irregularly scheduled, and asynchronous with the evolving needs of digital information services. Ezeani (2020) also mentioned that librarians in Sub-Saharan Africa employed self-learning as a principal means of learning because institutional support for regular digital training programs was not available. This lack of standardized training limits the ability of library staff to properly manage digital tools or participate in collaborative digital activities like consortia.

The study revealed that 95% of the interviewees strongly favour increased funding, national coordination, updated institutional policies, and regular staff training is found in a number of studies. Mukherjee and Patra (2023) emphasized the reality that sustainable digital library development relies on a multi-faceted approach that involves investment in infrastructural setup, policy reform, and human capacity development. Bello and Adepegba (2023) emphasized the need to harmonize national education policies with library development, arguing that library services can thrive solely when supported by consistent funding, strategic coordination, and institutional

backing. UNESCO (2025) also proposes strong national frameworks that integrate training, policy, and investment to facilitate strengthened equitable digital access in all educational institutions.

The research finding is that institutional and system support for digital capacity is required while there is keen stakeholder interest in the formation of consortia. Nkanu and Okon (2019) attest that although librarians and institutional stakeholders are very interested in being involved in consortia, inadequate institutional frameworks and spasmodic policy support have hampered long term advancement and sustainability. Likewise, Okojie and Omeluzor (2020) had established that the efficiency of digital library consortia in Nigeria is often undermined by poor administrative commitment and lack of systemic coordination, not withstanding perceived interest among professionals. These findings emphasise the necessity of equal institutional support to equal stakeholder interest.

Emerging Opportunities

New initiatives present promising opportunities for developing the digital competencies of polytechnic libraries in Nigeria, thus reinforcing more vibrant consortium participation. One of the most notable is the National Digital Library Project led by the Nigerian government. Its aim is to create a central repository in digital form that provides equal access to a wide range of academic material by all tertiary institutions, including polytechnics (Okoro & Akinola, 2023). With the inclusion of polytechnic libraries on this national portal, opportunities for greater sharing of resources, streamlined access, and collective bargaining of digital content exist. A complement to such national initiatives is government and donor supported ICT interventions to support capacity building and infrastructure development. Projects supported by TETFund, UNESCO, and foreign development partners have been providing funding for ICT infrastructure development, the purchase of hardware, and the training of library staff (Eze & Onuoha, 2022). Such interventions help in closing the digital divide as they target libraries that are resource-poor, particularly in rural areas, thus making them more prepared for participation in consortium schemes.

Moreover, the emergence of open access and subscription based collaborative platforms has provided means for polytechnic libraries to access scholarly materials without high costs. Projects like HINARI, JSTOR, and Research4Life offer negotiated access to e-books and journals through institutional collaborations, making consortium membership a more attractive and cost effective option (Adeyemi & Oladipo, 2023). Open access initiatives, in particular, enhance the collaborative nature of consortia through the promotion of limitless information sharing that

benefits all member institutions. Together, these emerging opportunities offer a positive way towards improving the digital readiness of Nigerian polytechnic libraries. Drawing on these trends will be crucial to overcoming current limitations and harnessing the utmost potential of membership in a consortium to advance education and research.

Conclusion

In summary, the Nigerian polytechnic libraries' online capacity is a determining factor for their ability to meaningfully support consortium building efforts. While monumental challenges remain e.g., inadequate ICT infrastructure, low ICT capacity among staff, and ineffective institutional policies, there are also encouraging opportunities created by country level digital library projects, government and donor supported ICT initiatives, and the emergence of collaborative digital spaces. Faced with regional disparities and investing in end to end capacity-building solutions are steps needed to enhance consortium readiness. Digital capacity building would not only promote sharing of resources and service provision among polytechnic libraries but also further greater educational and research goals. Seizing these opportunities and overcoming current limitations, Nigeria's polytechnic libraries can become strong partners in consortia that enable access to knowledge, promote collaboration, and foster innovation in the academic community.

Recommendations

1. Polytechnic libraries should improve their ICT infrastructure, such as stable internet connections, updated computer hardware, and makes library integrated systems, a priority. This will enhance their digital capacity and allow them to contribute smoothly to consortium activities.
2. Constant and comprehensive training programs should be implemented to develop ICT competencies of library personnel. Building foundational, intermediate, and advanced skills will facilitate staff to manage digital resources adequately and deliver quality services via consortia.
3. Polytechnic managements must create strong policies to accelerate the process of joining a consortium, e.g., resource sharing, exchange of personnel, funding mechanisms. Strong institutional commitment and policy will be critical for the success of long term sustainable consortium relationships.

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