CAPACITY BUILDING FOR DIGITAL READINESS AND SERVICE PERFORMANCE IN RESOURCE-CONSTRAINED AFRICAN LIBRARIES

BY

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Abstract

Libraries operating with limited finance, infrastructure and staff require capacity development that connects professional learning to sustainable services. This conceptual article examines capacity-building approaches relevant to African libraries, with particular attention to Nigeria, and proposes an Integrated Capacity Building Framework. Drawing on selected scholarly studies and professional publications, it links continuing professional development, appropriate infrastructure, organisational learning and partnerships within an enabling policy environment. Digital readiness is positioned as an intermediate capability through which these investments may improve accessibility, responsiveness, reliability and user experience. The framework adds a phased implementation pathway, minimum readiness conditions and a practical evaluation matrix. African research and programme examples illustrate its rationale but do not establish its effectiveness. The article contributes a context-sensitive planning framework and testable propositions for future research. Sustainable improvement depends on aligning skills, recurrent funding and governance with locally defined service priorities.

Keywords: Capacity building; digital readiness; African libraries; service performance; digital inclusion

Introduction

African libraries are expected to support learning, research and participation in increasingly digital information environments. Doing so depends on more than acquiring computers or subscribing to electronic resources. Staff must be able to operate services, managers must support changes in working practices, and institutions must maintain infrastructure and finance recurrent costs. For libraries facing resource constraints, the central question is how to combine these requirements into a feasible capacity-development programme.

Recent professional priorities reinforce this need. The International Federation of Library Associations and Institutions (IFLA, 2025) identifies practical, partnership and personal development skills as complementary components of preparedness. Adewojo's (2026) review of African library digital literacy initiatives also distinguishes the research-oriented training associated with academic libraries from the basic digital skills and outreach emphasis of public libraries. Capacity building must therefore respond to library mandate and community need rather than assume a uniform training curriculum.

Digital exclusion remains a relevant contextual constraint. The International Telecommunication Union (ITU, 2025) estimates that 36% of people in its Africa region used the internet in 2025, compared with 74% globally. These regional estimates do not measure library connectivity or Nigerian library readiness. They still show why a service strategy that depends entirely on users' own devices and connectivity can exclude intended beneficiaries. Digital

services need to be planned alongside assisted access and appropriate alternatives.

In Nigeria, Igbokwe (2023) reports learning-related capacity-building practices in federal university libraries while identifying funding difficulties. More recent research identifies operational digital skills gaps and management-related barriers to staff development (Adetunla& Chowdhury, 2025). The practical challenge is to translate learning activities into sustained capability. A workshop may increase awareness without changing a service if staff lack access to equipment, time to practise or managerial support. Equally, a reliable network cannot generate useful services without skilled staff and accessible content. The relationship between capacity development and performance should consequently be examined as conditional rather than automatic.

This article develops the Integrated Capacity Building Framework (ICBF) proposed for resource-constrained libraries. It connects four intervention domains to readiness conditions, a sequence of implementation decisions, and explicit performance measures. The framework is ntended to be adapted across African library settings, with Nigeria as its principal practice context. It does not assume that public, academic, school and community libraries share the same resources or service priorities.

Three questions guide the discussion. Which capacity-building approaches are relevant to resource-constrained libraries? Through what mechanisms might these approaches strengthen digital readiness and service performance? How can an integrated framework guide implementation and future empirical evaluation? The argument is that capacity development becomes more useful when staff learning, infrastructure, organisational routines and partnerships are planned around a defined service problem and assessed together.

Scope and Approach

This is a conceptual framework article supported by a selective narrative synthesis. It brings together capacity-development concepts, empirical African library studies and professional or programme publications. The analysis organises these materials around the constraints affecting libraries, the mechanisms through which capacity may develop and the conditions required for service improvement. It does not report primary data, a systematic review, a meta-analysis or a completed evaluation of the proposed framework.

The evidence base combines a foundational capacity-development publication with recent library research and current institutional resources, including material published or updated during 2024–2026. Empirical studies inform the identification of capacity problems; professional publications inform service principles and emerging priorities; programme accounts illustrate implementation. These evidence forms have different strengths and are not interchangeable. Where only publisher abstracts or institutional summaries were accessible, interpretation is restricted to the methods and broad findings explicitly reported there.

The framework is developed by identifying recurring capacity domains, explaining their connections to readiness and translating those connections into implementation choices and research propositions. Selection was purposive rather than exhaustive, and no complete search log or formal quality appraisal underpins the synthesis. The resulting framework is a reasoned proposal whose usefulness and explanatory value require further testing.

Conceptual foundations

Capacity building as a continuing institutional process

The United Nations Development Programme (UNDP, 2009) treats capacity development as a process involving individuals, organisations and the enabling environment. This perspective is useful because staff competence sits within organisational arrangements and broader conditions. A librarian may acquire a skill but remain unable to apply it when

permissions, budgets or infrastructure prevent implementation. Training attendance is therefore an input to capacity development, not sufficient evidence that institutional capacity has increased.

In this article, capacity building refers to deliberate efforts to strengthen the skills, resources, relationships and organisational arrangements needed to provide and sustain library services. The term includes continuing professional development (CPD), technical support, leadership, documentation, resource mobilisation and collaboration. Its practical objective is the ability to perform agreed functions reliably and adapt them as needs change.

Digital readiness

Digital readiness is defined here as a library's demonstrated capability to introduce, operate, maintain and improve a specified digital service. It includes staff competence, usable infrastructure, supportive governance and the ability to assist intended users. Readiness is service-specific: a library may be ready to provide mediated online reference while lacking the storage, rights management and preservation arrangements needed for a digitisation programme.

This definition distinguishes readiness from technology ownership. An inventory shows what equipment exists; readiness assessment asks whether a service can function under normal operating conditions and foreseeable interruptions. It also separates staff capability from user capability. Both matter, but a library should not interpret users' need for assistance as evidence that digital provision is unnecessary. Assisted access is itself a service responsibility.

Service performance and resilience

Service performance concerns the extent to which provision meets users' needs through accessibility, reliability, responsiveness and satisfactory outcomes. Appropriate measures depend on the service. Catalogue search performance may involve successful retrieval and availability; a digital skills programme may involve demonstrated task completion; mediated research support may involve response time and enquiry resolution. Usage counts alone cannot show whether a service is effective or equitable.

Resilience here refers to the ability to maintain essential functions and recover when staff, funding, or infrastructure are disrupted. It is a longer-term objective, not an immediate result of purchasing technology. Documentation, succession arrangements, tested recovery procedures and recurrent budgets may support resilience, but their effects must be assessed over time. This distinction prevents short-term outputs from being presented as evidence of sustainable transformation.

Constraints and relevant capacity building approaches

Interacting constraints

Resource constraints should be understood as interacting conditions rather than a single funding deficit. Limited finance affects connectivity, equipment replacement and release time for learning. Staff shortages make training participation difficult and concentrate technical knowledge in a few individuals. Weak support arrangements can turn minor faults into prolonged service interruptions. A plan that addresses only one of these conditions may leave the main service bottleneck unresolved.

Organisational arrangements also influence whether learning becomes practice. Nakaziba and Ngulube's (2024) mixed-methods study of selected Ugandan university libraries identifies barriers including limited management support, funding, opportunities and competent staff. Their model already connects CPD to organisational and technological conditions. This is an important precedent: integrated thinking is not absent from the literature, and the proposed ICBF should be assessed as an implementation-oriented extension rather than the first attempt at integration.

Mubofu's (2025) survey of a convenience sample of 71 Tanzanian library association members similarly identifies limited training access, budget constraints and resistance to new technologies. Its sampling limits

generalisation, but the reported barriers reinforce the need to connect learning provision with conditions for application. Adetunla and Chowdhury (2025) identify policy and financing barriers in Nigerian university libraries, further supporting attention to institutional arrangements rather than attributing skills gaps solely to individual motivation.

Demand-side constraints deserve equivalent attention. Users may face data costs, limited device access, inaccessible interfaces, language barriers or insufficient confidence. These conditions can persist even when institutional systems function. The IFLA–UNESCO Public Library Manifesto (IFLA and UNESCO, 2022) provides a relevant normative basis for inclusive access and digital literacy. Its public library mandate should inform, rather than be assumed identical to, the responsibilities of other library types.

Continuing professional development and peer learning

Continuing professional development (CPD) can combine workshops, mentoring, supervised practice, self-directed learning and peer exchange. Its value depends on alignment with actual responsibilities. In-house learning and staff rotation may widen experience without requiring repeated travel. Igbokwe's (2023) Nigerian survey supports considering learning practices, including rotation, within service development; it does not establish that any single modality will produce the same results in every library.

A train-the-trainer approach can spread expertise, but its effectiveness depends on time for secondary training, suitable materials and assessment of trainees' performance. Without these arrangements, knowledge can remain concentrated in the original participants. Peer learning similarly needs clear learning objectives and opportunities to apply skills. Online participation may lower travel costs while still requiring connectivity and protected working time.

Appropriate technology and shared provision

Technology adaptation should begin with the service problem and operating environment. Low-bandwidth interfaces, mobile access, local hosting or shared hosting may be appropriate in different settings. Open-source software can reduce licence expenditure, but implementation, support, security and migration still require resources. Cloud provision can shift maintenance responsibilities while introducing connectivity dependence and recurrent charges. Neither option is inherently sustainable without local assessment.

Consortia and technical partnerships can pool expertise, procurement and training. Community collaboration can improve the relevance of outreach and learning materials. These arrangements are practical strategies rather than equivalent explanatory theories. Theories of technology acceptance may help investigate users' willingness to adopt a service, but they do not themselves specify a complete capacity-building programme. A useful framework should keep explanations of adoption distinct from interventions intended to develop institutional capability.

Implications for integration

The relevant approaches offer complementary mechanisms: training develops competence, peer learning supports application, appropriate technology improves operational feasibility and partnerships extend access to resources. Their limitations arise when dependencies are neglected. The planning task is therefore to identify which combination addresses a particular service problem and what must be in place before expansion. This leads to a framework that links intervention choices to readiness and performance rather than treating participation or equipment acquisition as the final outcome.

The Integrated Capacity Building Framework

The ICBF comprises four interacting domains within an enabling environment. It proposes that coordinated capacity-building

activities strengthen service-specific digital readiness, which may then improve performance. The relationship depends on user access, content relevance, and continuity of support. Performance evidence feeds back into decisions about training, technical design and resource allocation.

Professional learning and demonstrated competence

The first domain connects CPD to observable work. Managers and staff should identify a small set of tasks required for the priority service, such as resolving an electronic resource access problem, creating an accurate catalogue record or helping a user evaluate an online source. Learning activities should combine explanation, practice and feedback. Assess completion through task demonstration rather than attendance alone.

Each activity should produce an application outcome, such as an improved procedure or a supervised service session. Shared instructions and a second trained staff member reduce dependence on one specialist. Smaller libraries may obtain backup through a partner institution rather than duplicate every role internally. Management remains responsible for providing time, equipment access and reasonable opportunities to practise.

Appropriate infrastructure and technical stewardship

The second domain concerns infrastructure that staff can operate and the institution can sustain. Planning should consider power, bandwidth, accessibility, maintenance, security, backup and equipment replacement together. Whole-life costing should cover implementation and recurrent expenses, including support and staff time. A donated system should be assessed against these obligations before acceptance.

Minimum readiness conditions should be defined for each proposed service. An online catalogue, for example, requires usable records, trained staff, reliable access, backup and a support arrangement. A digitisation service additionally requires rights assessment, quality control and preservation planning. Such conditions help managers defer expansion when a critical dependency is missing, while allowing achievable services to proceed.

Organisational learning and accountable leadership

The third domain converts individual knowledge into shared routines. A named service owner should coordinate tasks, document decisions and review performance with staff. Brief, regular reviews can identify recurring access problems and distinguish training needs from faults requiring technical intervention. Written procedures should be concise enough to use during daily work and updated when practice changes.

Leadership support includes workload allocation, fair access to development opportunities and authority to resolve operational problems. Staff should be able to report unsuccessful trials without concealing failures. Innovation should proceed through bounded pilots with clear criteria for continuation, adjustment or closure. This makes experimentation accountable to service needs and operating resources.

Partnerships and resource mobilisation

The fourth domain connects libraries to professional associations, parent institutions, schools, technical providers and community organisations. Partners should contribute to a defined function rather than an unspecified aspiration to collaborate. Agreements should identify responsibilities for delivery, costs, support, data handling and continuity. Shared provision needs arrangements for migration or withdrawal if a partner's priorities change.

For Nigerian libraries, the Nigerian Library Association could coordinate peer learning, mentoring and reusable training materials, while parent institutions provide budget and staffing authority. Community partners can help identify excluded groups and assess learning needs. Resource mobilisation should include recurrent institutional funding alongside grants. Essential access should not depend on charges that undermine inclusion.

Enabling environment and emerging technologies

Policy, procurement arrangements, professional standards and funding structures shape all four domains. Managers should identify decisions within the library's authority and those requiring action by the parent institution or government. The framework does not assume that local initiative can remove national infrastructure deficits. It instead makes these dependencies visible for planning and advocacy.

Emerging technologies add competence and governance requirements. Tshabalala and Dube (2024) identify digital competencies and algorithmic literacy as relevant to technology-supported library services. Ogunbodede and Ejitagha (2026) report moderate digital literacy and artificial intelligence readiness among respondents in Nigerian federal university libraries, alongside institutional and infrastructure limitations. These survey findings do not establish readiness for a particular deployment. Within the ICBF, readiness to use artificial intelligence should include checking outputs, protecting confidential information and retaining human responsibility for service decisions. AI deployment is not a universal readiness requirement. Adoption should follow a demonstrated service need, a cost assessment, and a credible support arrangement.

Figure 1 summarises the proposed relationships. The arrows represent analytical propositions rather than measured causal effects. The feedback loop shows how monitoring, evaluation, and learning inform subsequent capacity-building decisions.

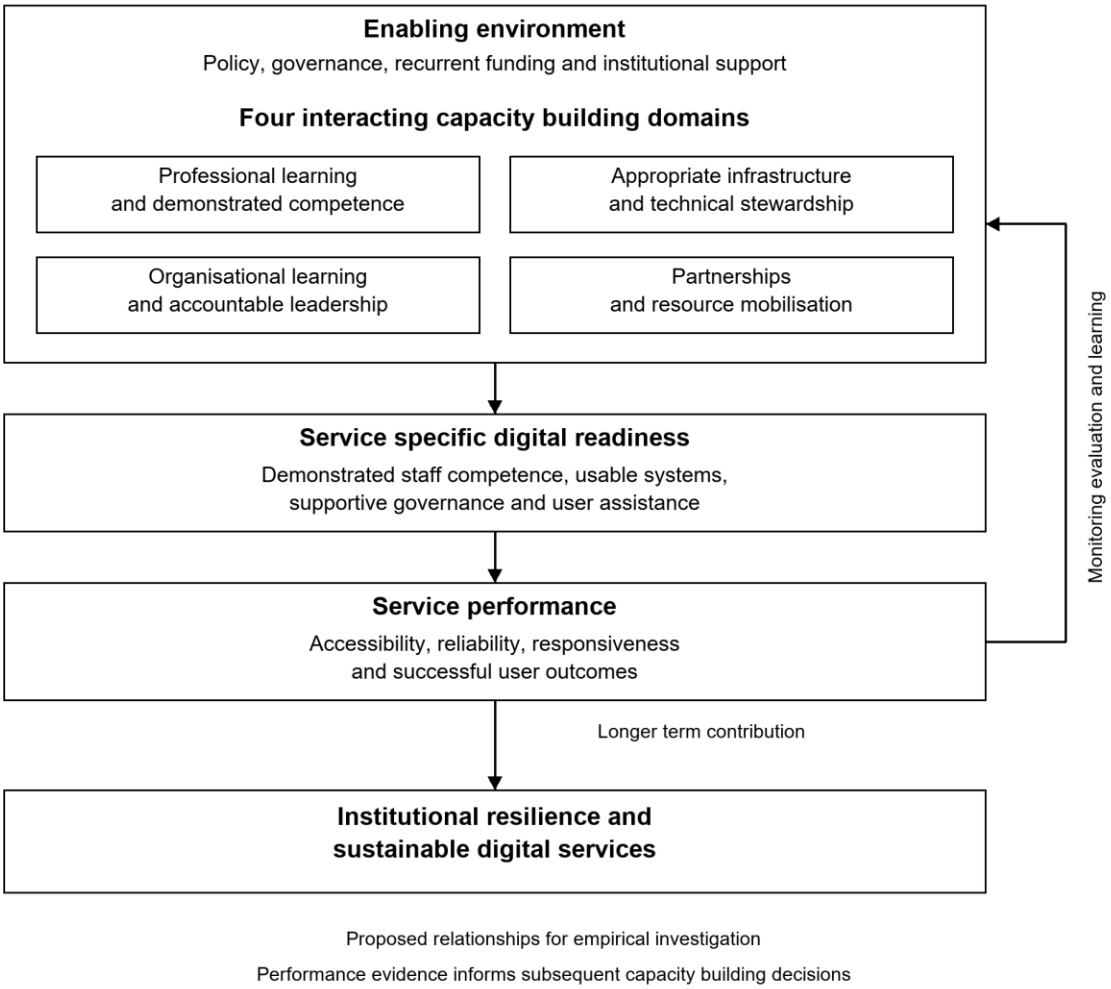

Figure 1: Proposed Integrated Capacity Building Framework
Source: Author's conceptual synthesis.

Propositions for empirical investigation

Proposition 1: CPD combined with opportunities to apply learning is associated with stronger demonstrated staff competence than CPD attendance alone. Proposition 2 is that competence is more likely to translate into service improvement where usable infrastructure and managerial support are present. Proposition 3 is that documented workflows and shared expertise reduce vulnerability to staff absence or turnover. Proposition 4 is that partnerships contribute to sustained provision when recurrent costs and responsibilities are explicit. These propositions permit testing of the framework without presuming that all domains carry equal weight in every setting.

Phased implementation and evaluation

Diagnose and prioritise

The first phase is a service-focused assessment. A library should identify its users, review current performance and select one or two problems that materially restrict access or quality. Staff task demonstrations, equipment checks, outage records and short user consultations can provide a manageable baseline. Assessment should include people who struggle to use current services rather than rely entirely on existing digital users.

The resulting plan should record the priority service, its main bottleneck, the responsible officer and the resources needed. A small community library might prioritise assisted access to educational information; an academic library might prioritise reliable access to subscribed resources. The appropriate starting point is the service's minimum operating conditions, not an assumed ladder of technological sophistication.

Stabilise essential functions

The second phase addresses dependencies that prevent dependable operation. Actions may include repairing equipment, assigning support responsibility, training backup staff and documenting essential procedures. Managers should agree on affordable continuity arrangements and confirm who will pay recurrent costs. The phase is complete when the selected service can meet locally defined minimum conditions, not when all infrastructure deficiencies have disappeared.

Pilot and learn

The third phase introduces a bounded improvement with a defined user group and review period. Staff should collect both operational records and user feedback. A pilot may need revision if users cannot complete intended tasks, costs exceed available support or service interruptions persist. The decision to expand should consider benefits, unequal access and staff workload together.

Institutionalise and review

The fourth phase incorporates a successful pilot into routine provision through budgets, role descriptions, maintenance arrangements and induction materials. Expansion should follow evidence that the service is supportable. Periodic review should revisit user needs and test continuity arrangements. These phases can overlap and repeat; libraries with functioning systems may begin with diagnosis followed directly by a pilot.

Table 1 provides a proposed monitoring matrix. It is a planning aid, not a validated measurement instrument. Agree targets after baseline assessment; prescribing identical thresholds across library types would obscure differences in mandate and resources.

Table 1 Proposed monitoring matrix for local adaptation

Dimension	Proposed indicator	Evidence and review
Staff competence	Staff demonstrating agreed service tasks/staff assigned to those tasks	Observed task checklist; baseline and after training
Service	Available service hours / scheduled	Outage and access log; monthly

Dimension	Proposed indicator	Evidence and review
reliability	service hours	
User outcomes	Users completing an agreed task/users attempting the task	Brief observed task or follow-up; each pilot review
Responsiveness	Median time to resolve a defined enquiry type	Anonymised enquiry log; monthly
Inclusive access	Task completion and access barriers by relevant user group	Voluntary accessible feedback; each pilot review
Continuity	Critical procedures with documented backup responsibility	Procedure and recovery checks; quarterly
Financial sustainability	Recurrent costs with confirmed funding / planned recurrent costs	Budget and support agreements; quarterly

All indicators and review intervals are proposed. Set local targets after baseline assessment.

Measures should distinguish inputs, activities, capability and outcomes. Training expenditure is an input; a completed session is an activity; successful task demonstration indicates capability; improved user task completion is an outcome. A simple spreadsheet or paper register may be sufficient for initial monitoring. Data collection should remain proportionate and protect users' privacy.

Changes in performance cannot automatically be attributed to capacity building. Increased resource use may reflect a new subscription, academic calendars or changes in student numbers. Service comparisons should therefore record relevant contextual changes and use consistent definitions. Where feasible, staged implementation across branches can provide a stronger basis for evaluation than a single before-and-after comparison.

African evidence and practice illustrations

Three sources illustrate the framework's rationale at different levels. Igbokwe's (2023) descriptive survey of 178 respondents in Nigerian federal university libraries links learning practices to perceived service delivery and identifies inadequate funding. Its relevance lies in linking staff development to institutional conditions. However, questionnaire-based perceptions should not be read as causal estimates of service improvement.

Nakaziba and Ngulube (2024) combine data from librarians and university librarians across six Ugandan universities. Their proposed model draws on adult learning, learning organisation and technology–organisation–environment perspectives. It provides a close conceptual precedent for the ICBF. The present framework focuses on service-specific readiness conditions, implementation sequencing, and observable evaluation measures; its applicability across library types remains to be established.

EIFL's Digital learning @ Ghana public libraries programme provides a documented practice illustration. Its project account describes training 30 librarians and ICT coordinators across 15 public libraries, alongside school outreach and library-based digital learning workshops. The programme ran from September 2023 to May 2026 and combined assessment, training and partnerships (EIFL, n.d.). This illustrates how staff development can connect to community-facing delivery. The implementing organisation publishes the account, and participation totals do not, on their own, establish sustained learning or causal impact.

Taken together, these examples support the plausibility of linking learning, infrastructure and institutional support. They do not validate the ICBF as a whole. A programme starting in libraries that already have computers and connectivity may be less

transferable to branches lacking those foundations. Adoption should therefore be based on local diagnosis rather than replication of a reported success.

Implications, limitations and research agenda

For librarians, the framework suggests linking development goals to service tasks and sharing knowledge through mentoring and documentation. For managers, it requires protected learning time, maintenance provision and performance review. Responsibility should be distributed fairly: staff initiative cannot substitute for institutional support, while management investment needs staff participation to become useful capability.

Parent institutions and governing authorities should integrate library development with staffing, infrastructure and recurrent budgets. Technical units should agree with libraries on responsibilities for access management, security, backup and incident response. Professional associations can support regional peer networks, while library and information science educators can connect technical instruction to service design and evaluation. These are proposed roles that require negotiation within each institution.

Policymakers and development partners should consider libraries' place in digital inclusion and assess funding proposals against continuity needs. Support for equipment should include realistic arrangements for training and maintenance. The broader skills emphasis in IFLA (2025) offers a useful basis for balancing technical instruction with collaboration and leadership development.

Several limitations remain. The selective literature base may omit relevant studies and unsuccessful initiatives. Academic library evidence cannot be assumed to represent public or community libraries. The framework does not establish the relative importance of its domains, implementation costs, or the time needed for change. It also leaves unresolved how institutions with severe staffing and infrastructure shortages can secure minimum operating resources.

Future research should refine the constructs through expert and practitioner review, including users and representatives of smaller libraries. Multi-site studies should test whether the proposed indicators are feasible and meaningful across settings. Longitudinal evaluations could examine whether changes in readiness precede service improvements and whether these persist after grants end or trained staff leave. Comparative research should investigate differences between library types and locations, including unintended exclusion and workload effects. Such work would strengthen, revise or reject the proposed relationships.

Conclusion

Capacity building for digital library services requires coordination across professional learning, appropriate infrastructure, organisational practice and partnerships. The ICBF translates this argument into a service-focused planning approach with minimum readiness conditions, phased implementation and evaluation measures. Its practical value is to help resource-constrained libraries choose supportable improvements and make dependencies visible. The framework remains a conceptual proposal. Context-sensitive implementation and empirical research must assess its contribution to digital readiness, service performance, and institutional resilience.

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