EVALUATING THE INTEGRATION OF SUBJECT-SPECIFIC TRAINING IN THE NIGERIAN LIBRARY AND INFORMATION SCIENCE CURRICULUM: A GAP ANALYSIS AND ROADMAP FOR PROFESSIONAL DIVERSIFICATION

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Abstract
The rapid developments of information technologies and changing global labour-market demands have necessitated a fundamental transformation of Library and Information Science (LIS) education. In Nigeria, traditional generalist programmes often fail to adequately prepare graduates for specialized professional roles. This paper identifies a multidimensional gap between existing academic training and the competencies required in the contemporary information economy, particularly in relation to technical skills and the underrepresentation of specialized fields such as health informatics, legal librarianship, digital curation, and museum management. The paper further highlights the delayed integration of Fourth Industrial Revolution technologies, including artificial intelligence and robotics, into LIS education. This delay threatens the relevance of the profession in an increasingly digital and automated environment. To address these deficiencies, the paper proposes a strategic roadmap for curriculum reform based on a decentralized, track-based model. The framework advocates early specialization after foundational coursework, thereby allowing students sufficient instructional time to acquire subject-specific knowledge, specialized taxonomies, professional standards, and emerging technological skills. Key recommendations include the introduction of formal mentorship programmes modeled after professional residency programmes, the integration of advanced digital curation and electronic resource management into core LIS training, and the development of interdisciplinary partnerships with professional sectors. The paper concludes that a structural shift in LIS education is necessary to transform graduates from traditional custodians of books into subject specialists and strategic agents of change capable of functioning in a global, multidisciplinary, and technology-driven labour market.

Keywords: LIS curriculum, professional diversification, artificial intelligence, subject-specific training, digital curation, curriculum reform

Introduction

Library and Information Science (LIS) education is undergoing significant transformation as a result of rapid technological development and changing labour-market demands. In Nigeria, LIS programmes have traditionally adopted a generalist approach. However, there is increasing recognition that graduates of such programmes are often inadequately prepared for specialized roles within the contemporary information profession (Bright & Colón-Aguirre, 2022). Subject-specific training in LIS represents a strategic shift from traditional generalist education towards the development of deep, domain-specific expertise required in specialized professional environments (Tait & Pierson, 2022). Hertenstein (2023) described this approach as the cultivation of specialized technical and theoretical competencies, including knowledge of unique taxonomies, evidence-based practices, specialized metadata standards, and professional procedures associated with fields such as health informatics, legal librarianship, and cultural heritage management.

Although foundational LIS curricula provide students with broad professional knowledge, a substantial gap remains between existing academic programmes and the specific requirements of the contemporary labour market. Current LIS syllabi often fail to align adequately with the competencies specified in modern LIS-related job descriptions (Tait & Pierson, 2022). This lack of specialized training limits professional diversification into important fields such as law librarianship, medical informatics, digital curation, and knowledge management (Hertenstein, 2023).

Library and Information Science curriculum refers to a structured educational framework designed to provide students with the theoretical knowledge, practical skills, and professional ethics required to manage, organize, preserve, and disseminate information in diverse environments (Stahl & Knotts, 2018). The modern LIS curriculum should serve as a roadmap for transforming students from traditional custodians of books into strategic agents of change capable of navigating both physical and digital information environments (Tait & Pierson, 2022).

Historically, the generalist framework has left many graduates insufficiently prepared for the specialized requirements of the modern workforce (Bright & Colón-Aguirre, 2022). The integration of specialized competencies, ranging from the cataloguing of rare books and special collections to the management of electronic resources, remains inconsistent across LIS curricula.

These competencies are often treated as peripheral rather than as essential components of professional education (Hertenstein, 2023; Park, 2014). Research indicates that many LIS programmes do not adequately cover the competencies required by special librarians. This creates a shortage of professionals who can serve effectively as subject specialists and agents of change within their organizations and communities (Peyvand & Yusuf, 2016; Hysa & Juznič, 2013). In addition, the emergence of Fourth Industrial Revolution technologies, such as artificial intelligence and robotics, presents both a challenge and an opportunity for LIS curriculum developers (Tait & Pierson, 2022).

Beyond technological proficiency, there is a need for LIS education to move beyond traditional library boundaries in order to prepare graduates for a changing global labour market (Onyancha & Majanja, 2017). Recent job descriptions identify specialized areas such as museum informatics, archival management, medical librarianship, digital curation, and knowledge management as important career opportunities for LIS graduates. However, these areas are often underrepresented in standard LIS curricula (Marty & Twidale, 2011).

Similarly, inadequate coverage of knowledge management limits the ability of LIS professionals to function as strategic information assets in corporate, governmental, and administrative environments (Husain & Nazim, 2015). In a developing economy such as Nigeria, rigorous curriculum assessment is necessary to align professional education with societal needs. LIS graduates should not be prepared only as custodians of books; they should also be trained as subject specialists who can function effectively in diverse professional environments.

This paper therefore evaluates the integration of subject-specific training into the Nigerian LIS curriculum, identifies critical gaps through a review of relevant literature and professional requirements, and proposes a strategic roadmap for curriculum reform and professional diversification.

Literature Review

The Generalist Orientation of LIS Education

The Nigerian LIS curriculum remains predominantly based on generalist training. This orientation has created a significant disconnect between academic preparation and the technology-intensive requirements of contemporary job descriptions (Bright & Colón-Aguirre, 2022). Although the generalist approach provides a valuable foundation in cataloguing, classification, reference services, collection development, and library management, it may not provide sufficient preparation for specialized professional roles. The

global labour market increasingly requires proficiency in areas such as data science, artificial intelligence, digital preservation, electronic resource management, health information systems, and legal information services.

Many LIS graduates therefore enter the workforce with broad theoretical knowledge but limited practical and domain-specific competence. This situation contributes to what may be described as the "prepared but unprepared" phenomenon: graduates possess the academic qualifications required to enter the profession but lack the specialized skills required to perform effectively in emerging professional environments.

Technical and Practical Competency Requirements

Recent studies indicate that the curriculum gap has expanded to include limited proficiency in advanced ICT, artificial intelligence, digital curation, and data management (Agava, 2021; Ubaga et al., 2025). Consequently, many LIS graduates experience a skills mismatch because

their traditional training does not adequately address the interdisciplinary and data-driven requirements of the contemporary labour market (Abubakar, 2021; Ssekitto & Mukiibi, 2024).

The transition from traditional to digital information services requires LIS professionals to possess practical knowledge of digital library systems; database design and management; data analytics; cloud computing; Artificial intelligence; robotics; digital preservation; electronic resource management; metadata standards; and information security.

However, many LIS programmes continue to rely heavily on classroom-based theoretical instruction. The absence of functional laboratories and opportunities for experiential learning limits students' ability to apply theoretical knowledge in real professional contexts (Onifade & Alex-Nmecha, 2024; Omotoso & Modupeola, 2025).

Subject-Specific Competency Gaps

The current LIS curriculum is largely organized around a generalist track and does not sufficiently prepare students for the nuanced requirements of specialized information environments. The following table summarizes major subject-specific competency gaps and their professional implications.

Table 1: Subject-Specific Competency Gaps in LIS Education

Specialization Area	Core Competency Gaps	Professional Impact and Barriers
Medical and health sciences libraries	Limited training in evidence-based practice, clinical data management, health information systems, and health research methodologies	Difficulty transitioning from traditional library roles to embedded clinical information specialists; limited alignment with professional standards in medical librarianship
Law and legal information services	Limited training in legal information systems, legal research, legal databases, and specialized information retrieval	Graduates may lack the knowledge required to support legal education, research, law firms, courts, and government institutions
Cultural heritage and special collections	Insufficient training in rare-book cataloguing, archival description, preservation, and cultural heritage management	These areas remain peripheral within LIS programmes, creating dependence on workplace training and informal mentorship
Digital informatics and digital curation	Limited interdisciplinary training in museum informatics, digital preservation, metadata standards, and digital collection management	Graduates may lack the technical competence required to manage hybrid collections across libraries, archives, and museums
Corporate knowledge management	Inadequate preparation in knowledge capture, organizational learning, business intelligence, and knowledge-sharing systems	Limited ability of LIS professionals to function as strategic information and knowledge managers in corporate environments

The inadequate coverage of competencies required by special librarians limits the diversification of the Nigerian LIS workforce (Peyvand & Yusuf, 2016). To remain relevant, LIS curricula must move beyond a repository-centred model towards a technologically integrated and professionally diversified framework.

Artificial Intelligence, Robotics, and Electronic Resource Management

The adoption of emerging technologies is no longer an optional feature of LIS education. It is increasingly necessary for the continued relevance of the profession. Tait and Pierson (2022) argued that artificial intelligence and robotics represent important opportunities for preparing future librarians. AI-based systems can automate routine activities such as cataloguing, preservation monitoring, reference support, and information retrieval. This enables LIS professionals to devote more time to higher-level activities, including research assistance, information consultancy, data management, user education, and personalized information services.

The shift towards digital information environments also requires professionals to be competent in electronic resource management. Park (2014) emphasized that electronic resource management should be integrated directly into cataloguing and collection management instruction rather than being treated as a separate or secondary subject. AI-powered chatbots, natural language processing, automated recommendation systems, and intelligent search tools are also transforming information retrieval. Without formal training in these areas, LIS graduates may be unable to function effectively in information environments where user engagement is increasingly mediated by intelligent systems.

The Need for Interdisciplinary Training

Contemporary professional roles require knowledge that extends beyond traditional library boundaries. Medical librarians, for example, require knowledge of clinical research and health information systems. Legal librarians require familiarity with legal terminology, legal databases, and legal research methods. Digital curators require knowledge of computing, metadata, preservation, and digital humanities.

Interdisciplinary collaboration between LIS departments and academic units such as Medicine, Law, Computer Science, Business Administration, and Information Technology can help address these needs. Such collaboration would enable LIS students to acquire knowledge that is relevant to specific professional contexts. The integration of knowledge management into LIS education is also important. Husain and Nazim (2015) observed that inadequate knowledge management education limits the ability of LIS professionals to transition into strategic corporate roles. LIS education should therefore incorporate business intelligence, organizational knowledge, information governance, knowledge-sharing systems, and strategic communication.

Gap Analysis: Structural and Content Gaps

The analysis of the Nigerian LIS curriculum reveals a multidimensional gap between academic instruction and the competencies demanded by the contemporary information economy. This gap is not merely a shortage of resources; it also reflects a fundamental misalignment of curricular priorities.

Technical and Practical Skills Deficiency

A major gap in African LIS education is the limited development of technical and practical skills required to operate in modern information environments. Although LIS programmes often provide strong theoretical foundations, students may receive insufficient hands-on training in ICT and digital information systems.

Recent assessments suggest that the theory-practice gap has widened (Agava & Underwood, 2020). Studies in Nigeria and Kenya confirm that many LIS curricula do not adequately address current labour-market requirements, resulting in significant skills mismatches (Rotich, 2021).

This situation produces graduates who understand conceptual frameworks but are unable to manage complex systems involving cloud computing, artificial intelligence, digital repositories, electronic databases, and automated library services (Abubakar, 2021; Alala, 2025).

The absence of functional laboratories also encourages dependence on traditional lecture methods. Consequently, students may complete their programmes without sufficient exposure to the systems and tools used in contemporary workplaces (Onifade & Alex-Nmecha, 2024; Omotoso & Modupeola, 2025). There is therefore a need for comprehensive curriculum reform that incorporates practical, interdisciplinary, and technology-based training (Salawu & Igwe, 2018).

Specialization and Domain-Specific Gaps

The generalist structure of the current LIS curriculum does not adequately prepare students for specialized information environments. Recent research indicates that the competencies required in special libraries remain significantly underrepresented. Many undergraduate programmes cover only a limited proportion of the skills needed in fields such as legal information services, medical informatics, cultural heritage management, and corporate knowledge management (Peyvand & Yusuf, 2022; Bright & Colón-Aguirre, 2022). As the roles of health information professionals expand towards active participation in clinical and research partnerships, LIS curricula must incorporate specialized taxonomies, evidence-based practices, clinical information systems, and health research methodologies (Ma, Stahl, & Knotts, 2018).

Similarly, the limited coverage of rare-book cataloguing, archival description, preservation, and special collections management restricts graduates' opportunities to work in cultural heritage institutions (Hertenstein, 2023). The absence of formal instruction in specialized descriptive standards creates a professional barrier and forces new practitioners to depend on workplace training

rather than academic preparation (Hertenstein, 2023; Tait & Pierson, 2022).

Technology Integration Gap

The transition towards increasingly automated information environments makes the limited integration of emerging technologies a critical concern. Future librarians will be required to work with artificial intelligence, robotics, automated retrieval systems, digital repositories, and data-intensive infrastructures (Tait & Pierson, 2022).

Many curricula continue to treat print and electronic resource management as separate activities. This fragmentation hinders the development of holistic collection management competencies. In addition, the limited integration of electronic resource management into core instruction leaves graduates inadequately prepared to manage the digital resources that constitute a substantial proportion of modern academic library collections (Park, 2014; Hertenstein, 2023). This problem is reinforced by the theory-practice gap. Students may understand the conceptual foundations of digital libraries but lack the practical skills required to work with artificial intelligence, cloud services, digital preservation systems, application programming interfaces, data analytics, and other Fourth Industrial Revolution technologies (Agava & Underwood, 2020; Alala, 2025).

The "Prepared but Unprepared" Phenomenon

The cumulative effect of these curricular gaps is a significant professional and psychological barrier. Graduates possess qualifications that provide formal entry into the profession but often lack the specific liaison, technical, and subject competencies required to support complex academic, clinical, legal, governmental, and corporate information environments (Bright & Colón-Aguirre, 2022). This problem is particularly evident in the limited integration of knowledge management education. Without adequate preparation in knowledge capture, business intelligence, organizational learning, and information governance, LIS professionals may find it difficult to move into strategic roles within corporate organizations (Husain & Nazim, 2015).

Although knowledge organization remains an essential part of LIS education, it does not by itself address the multidisciplinary, interpersonal, analytical, and technological skills required in modern knowledge-intensive workplaces. As a result, graduates may be restricted to administrative roles rather than functioning as strategic agents of change or subject specialists.

Without a shift towards track-based specialization in areas such as health informatics, legal librarianship, digital curation, and corporate knowledge management, the profession risks continued skills mismatch and reduced competitiveness in a data-driven global economy.

Roadmap for Professional Diversification

The existing theory-oriented curriculum should be complemented by a modular and practice-oriented framework that permits early specialization. This paper therefore proposes a four-tier roadmap for professional diversification in Nigerian LIS education.

Table 2: Roadmap for Professional Diversification

Tier	Area	Proposed action	Expected outcome
One	Curriculum restructuring	Replace the exclusively generalist model with a modular framework that allows students to choose tracks such as Health Informatics, Legal Information, Digital Curation, Cultural Heritage, or Knowledge Management	Students acquire foundational knowledge as well as domain-specific competencies
Two	Technological integration	Integrate artificial intelligence, robotics, data analytics, digital preservation, and electronic resource management into core LIS training	Graduates develop practical skills for technology-driven information environments
Three	Collaborative industry partnerships	Establish partnerships between LIS schools and hospitals, law firms, museums, archives, technology hubs, corporations, and research institutions	Students gain workplace experience through internships, mentorship, collaborative research, and field-based learning
Four	Continuing professional development	Introduce structured post-degree training through seminars, workshops, webinars, certifications, and professional residencies	Practitioners remain current with evolving technologies, professional standards, and labour-market demands

Curriculum Restructuring and Specialization Tracks

The proposed roadmap advocates a shift from a monolithic, theory-based curriculum to a decentralized, track-based model. This reform is necessary because a generalist focus often leaves graduates without the deep technical and domain-specific competencies required by modern employers (Bright & Colón-Aguirre, 2022).

Specialization should be introduced after students have completed foundational coursework. For example, students may be permitted to select specialized tracks during the later stages of their undergraduate programmes. Possible tracks include:

- Health information and medical librarianship;
- Legal information and law librarianship;
- Digital curation and digital preservation;
- Cultural heritage and museum informatics;
- Corporate knowledge management;
- Data librarianship and research data management; and
- Artificial intelligence and intelligent library systems.

Early specialization would provide sufficient instructional time for students to study specialized taxonomies, professional standards, evidence-based practices, metadata schemas, digital systems, and sector-specific information needs.

Technological Integration

Emerging technologies should be integrated into the curriculum as core components rather than treated as superficial electives. Relevant areas include:

- Artificial intelligence and machine learning;
- Robotics and automated library systems;
- Natural language processing;
- Electronic resource management;
- Digital repositories;
- Data analytics;
- Cloud computing;
- Digital preservation;
- Information security;
- Research data management; and
- Digital ethics.

The purpose of technological integration should not merely be to introduce students to new tools. Students should also understand the ethical, legal, social, and professional implications of deploying these technologies in libraries and information institutions.

Mentorship and Industry Partnerships

LIS education should include formalized mentorship programmes modeled partly on professional residency programmes. Such programmes would connect students with experienced professionals working in specialized environments.

Partnerships should be established between LIS departments and:

- Hospitals and medical research institutions;
- Courts, law firms, and legal information centres;
- Museums and cultural heritage institutions;
- Archives and records management agencies;
- Technology companies and innovation hubs;
- Corporate knowledge management units; and
- Research institutes and data centres.

These partnerships would enable students to gain practical experience, observe professional workflows, develop sector-specific competencies, and establish professional networks.

Continuing Professional Development

Professional learning should not end with the award of a degree. The rapid pace of technological and professional change requires LIS practitioners to participate in continuous professional development.

Continuing professional development may include:

- Workshops and seminars;
- Professional certifications;
- Webinars and online courses;
- Industry-based residencies;
- Short-term specialization programmes;
- Training in emerging technologies;
- Professional mentoring; and
- Collaborative research and knowledge-sharing activities.

Mandatory post-degree training would help ensure that practitioners remain current with global technological trends and changing professional expectations.

Interdisciplinary and Entrepreneurial Education

A decentralized curriculum should encourage collaboration between LIS students and students in disciplines such as Medicine, Law, Computer Science, Business Administration, and Communication. This would enable LIS students to understand the information needs, professional language, and operational environments of other disciplines (Onyancha & Majanja, 2017). Contemporary research also emphasizes the importance of integrating data science, digital ethics, and AI-powered information systems into LIS education (Adeleke & Ogunsola, 2022; Alala, 2025).

In addition, subject-specific training can support information entrepreneurship. Graduates may develop services in areas such as specialized information brokerage, research support, data consultancy, digital curation, knowledge management, and information technology training. Through such opportunities, LIS graduates can become employers of labour and contribute to the diversification of the profession.

Recent curriculum reform initiatives in Nigeria also emphasize functional and skill-based education rather than excessive subject coverage. The National Artificial Intelligence Strategy and related curriculum reviews further highlight the need for faculty development and "training-the-trainer" programmes in emerging technologies (Federal Ministry of Communications, Innovation and Digital Economy, 2024; Omotoso & Modupeola, 2025).

Conclusion

The evaluation of the Nigerian Library and Information Science curriculum reveals a significant misalignment between traditional pedagogical approaches and the changing demands of the global information economy. Although foundational generalist training remains important, its dominance has contributed to a "prepared but unprepared" situation in which graduates possess

formal qualifications but lack the domain-specific expertise required for specialized roles in medicine, law, cultural heritage, digital informatics, and corporate knowledge management. The gap is further widened by inadequate practical training and the delayed integration of Fourth Industrial Revolution technologies such as artificial intelligence, robotics, data analytics, and electronic resource management. To prevent professional obsolescence, Nigerian LIS education should adopt a decentralized and track-based curriculum. Such a model would preserve foundational LIS knowledge while providing students with sufficient time to acquire specialized competencies and practical experience. The proposed reform would transform LIS graduates from traditional custodians of collections into subject specialists, information strategists, and agents of change who are capable of functioning in digitized, autonomous, interdisciplinary, and global professional environments.

Recommendations

Based on the analysis, the following recommendations are proposed:

1. Nigerian LIS institutions should restructure their curricula to allow students to specialize after completing foundational coursework, particularly during the later years of undergraduate study.
2. LIS programmes should introduce specialized tracks in areas such as health informatics, legal librarianship, digital curation, cultural heritage management, corporate knowledge management, and data librarianship.
3. To bridge the theory-practice gap, LIS schools should establish formal mentorship and professional residency programmes modeled on clinical training in the medical profession.
4. Practical laboratory sessions should be strengthened through the provision of functional digital library laboratories, electronic resource management systems, data analytics tools, and artificial intelligence platforms.
5. Artificial intelligence, robotics, natural language processing, digital preservation, data science, and electronic resource management should be integrated into core LIS courses.
6. LIS departments should collaborate with academic units such as Medicine, Law, Computer Science, Business Administration, and Information Technology to develop interdisciplinary courses and projects.
7. Strategic partnerships should be established with hospitals, law firms, museums, archives, technology hubs,
   Corporations and research institutions to provide students with internships and field-based learning opportunities.
8. Mandatory subject-specific continuing professional development programmes should be introduced to ensure that practicing librarians remain current with technological and professional developments.

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