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Review Article

State of Library and Information Science Schools in Preparing Library Educators and Information Professionals for 21st Century Technologies in Nigerian Universities

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Abstract

The study investigated state of library and information science schools in preparing library educators and information professionals for 21st century technologies in Nigerian universities**.** Six objectives and corresponding research questions guided the study**.** This study adopted a descriptive survey research design to examine the state of Library and Information Science (LIS) schools in preparing library educators and information professionals for 21st-century technologies in South East Nigeria. The study was conducted in accredited universities offering LIS programmes in Michael Okpara University of Agriculture, Umudike, Chukwuemeka Odumegwu Ojukwu University and University of Nigeria, Nsukka, Nigeira. The population consisted of 160 LIS educators involved in curriculum delivery and the integration of emerging technologies into teaching and learning. A purposive sampling technique was used to select the universities, while simple random sampling was employed to select lecturers within the selected institutions. Since the population was relatively small and manageable, all 160 LIS educators were included in the study. A structured questionnaire titled *Preparation of Library Educators and Information Professionals for 21st-Century Technologies Questionnaire (PLEIPTQ)* was used for data collection. The instrument was validated by experts in Library and Information Science, while its reliability was established using the Cronbach Alpha method, which yielded a reliability coefficient of 0.84. Data collected analyzed using mean and standard deviation, with a benchmark mean of 2.50 for decision making. The findings revealed that LIS schools are institutionally ready for technology integration, educators possess adequate digital competencies, the curriculum reflects current technological trends, and ICT infrastructure is fairly adequate. However, inadequate funding, poor ICT infrastructure, limited digital skills, resistance to change, and poor internet connectivity remain major challenges. The study concluded that Library and Information Science (LIS) schools in South East Nigeria have been progressing very well in preparing Library Educators and Information Professionals to meet the demands of 21st Century Technologies. It recommended increased funding, regular ICT training, curriculum review, improved internet access, and stronger collaboration with professional and international bodies.

Keywords

Library and Information Science, Library Educators, Information Professionals, Emerging Technologies, Digital Competencies, ICT Infrastructure, South East Nigeria

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1. Introduction

The 21st century has been characterized by rapid advancements in digital technologies that are transforming the global information landscape. Emerging technologies such as artificial intelligence (AI), big data analytics, cloud computing, and the Internet of Things (IoT) are redefining how information is created, organized, accessed, and utilized across sectors. Within this evolving context, the field of Library and Information Science (LIS) has undergone significant transformation, shifting from traditional, print-centered practices to digitally driven, user-centered, and technology-enabled information service [4, 12]. As noted by [1], LIS education and training have consequently become increasingly important in building the professional capacity required to manage contemporary information environments. As a result, LIS education worldwide is increasingly expected to equip professionals with competencies in digital librarianship, data management, information literacy, and emerging technologies to meet the demands of the knowledge economy.

Globally, there has been a growing emphasis on aligning LIS curricula with technological innovations and 21st-century competencies. Scholars have argued that LIS schools must adopt interdisciplinary approaches that integrate information technology, data science, and user experience design into their programmes [3, 6].

In addition, international frameworks emphasize the development of educators' digital competencies and continuous professional development to enable them to effectively use digital technologies for teaching and learning. These global developments underscore the need for LIS education systems to be dynamic, technologically responsive, and future-oriented.

However, despite these global trends, evidence from Nigeria suggests a disconnect between LIS education and contemporary technological realities. Although LIS programmes have expanded across Nigerian universities, concerns persist regarding their effectiveness in preparing graduates and educators for technology-driven environments [1, 3, 8]. As reported by [9] some LIS curricula require further modernization and stronger integration of emerging technologies such as AI, digital repositories, and data analytics. [3] also observed that the integration of emerging technologies into LIS curricula remains an important issue in developing countries. Similarly, studies on LIS education in Nigeria have identified curriculum development and technological integration as continuing challenges [2, 7, 8]. Also, the digital competencies of LIS educators and professionals vary, with some requiring additional skills and training to effectively teach and apply modern technologies in professional contexts [10, 11, 15].

In addition to curriculum and competency challenges, infrastructural limitations pose significant barriers to effective LIS education in Nigeria. Inadequate access to ICT facilities, including functional computer laboratories, reliable internet connectivity, and relevant software tools, constrains practical training and hands-on experience for students. These infrastructural deficits undermine the ability of LIS schools to deliver technology-oriented education and limit the preparedness of graduates for modern library environments [10, 13]. These challenges are interconnected and can be better understood within a multidimensional framework. These challenges are not isolated but interconnected, and can be better understood within a multidimensional framework.

Beyond educational and professional imperatives, strengthening LIS education in Nigeria holds broader societal significance. As digital technologies become integral to governance, entrepreneurship, research, and innovation, well-trained library and information professionals can contribute to digital inclusion, information accessibility, and community empowerment. By improving LIS curricula and educator competencies, Nigerian universities can foster a new generation of professionals who not only meet contemporary professional standards but also contribute to socioeconomic development, digital literacy, and innovation within their communities. This highlights the importance of aligning LIS education with the digital age, not only for professional relevance but also for national and regional development.

Despite the recognition of these issues, there remains a paucity of comprehensive empirical studies that holistically assess the state of LIS schools in Nigeria across these three dimensions. Most existing studies tend to focus on isolated aspects such as curriculum development, ICT skills, or infrastructure, without providing an integrated analysis of how these factors collectively influence the preparation of library educators and information professionals for 21st-century technologies. This gap limits the development of evidence-based strategies for strengthening LIS education in Nigeria.

It is against this backdrop that this study examines the state of Library and Information Science schools in preparing library educators and information professionals for 21st-century technologies in Nigerian universities. By focusing on institutional readiness, human capacity, and technological relevance, the study seeks to provide a comprehensive understanding of existing strengths and gaps and to propose actionable recommendations for enhancing the quality and relevance of LIS education in the digital age.

2. Statement of the Problem

The rapid advancement of 21st-century technologies has significantly transformed the roles and competencies required of library and information professionals. Consequently, Library and Information Science (LIS) schools are expected to equip graduates and educators with relevant digital skills for technology-driven information environments. However, in Nigeria, there is growing concern that LIS education has not

kept pace with these changes.

Despite the expansion of LIS programmes across Nigerian universities, many schools continue to operate with outdated curricula, limited integration of emerging technologies, and varying levels of digital competency among educators. In addition, inadequate ICT infrastructure such as, insufficient computer laboratories, poor internet connectivity, and lack of relevant software, restricts practical training and limits students' acquisition of essential technological skills.

These challenges raise serious concerns about the preparedness of LIS graduates for contemporary professional demands. Although these issues can be examined through institutional readiness, human capacity, and technological relevance, existing studies in Nigeria have largely treated these factors in isolation, with limited attention to their combined influence. More importantly, there is a lack of empirical evidence focusing specifically on LIS schools in South-East, Nigeria, despite the region's significant concentration of such programmes.

This gap underscores the need for a comprehensive investigation into how institutional readiness, human capacity, and technological relevance shape the preparation of LIS educators and information professionals in South East Nigeria. Addressing this problem is essential for enhancing the quality of LIS education and ensuring the relevance of library professionals in a rapidly evolving digital environment.

2.1. Objectives of the Study

The general objective of this study is to examine the state of Library and Information Science (LIS) schools in preparing library educators and information professionals for 21st-century technologies in South East Nigeria. Specifically, the study seeks to:

1) Assess the level of institutional readiness of LIS schools in South East Nigeria for integrating 21st-century technologies into teaching and learning.
2) Examine the digital competencies (human capacity) of LIS educators in relation to the use of emerging technologies for instruction and professional practice.
3) Determine the extent of technological relevance of LIS curricula in reflecting 21st-century technological tools and trends.
4) Evaluate the availability and adequacy of ICT infrastructure for practical training in LIS schools in South East Nigeria.
5) Identify the challenges hindering effective preparation of library educators and information professionals for 21st-century technologies.
6) Propose strategies for improving LIS education in line with global technological advancements.

2.1.1. Research Questions

The following research questions will guide the study:

1) What is the level of institutional readiness of LIS schools in South East Nigeria for integrating 21st-century technologies?
2) What are the digital competency levels of LIS educators in the use of emerging technologies?
3) To what extent are LIS curricula technologically relevant to 21st-century professional demands?
4) How adequate are the ICT facilities and infrastructure available for practical training in LIS schools?
5) What are the challenges affecting the preparation of library educators and information professionals for 21st-century technologies?
6) What strategies can be adopted to enhance the integration of 21st-century technologies in LIS education?

2.1.2. Literature Review

The evolution of Library and Information Science (LIS) education in the 21st century has been significantly influenced by rapid technological advancements and the increasing complexity of the global information environment. LIS is no longer confined to traditional librarianship but has expanded into a multidisciplinary field encompassing data science, information systems, digital curation, and knowledge management [3, 6]. This transformation has necessitated a fundamental restructuring of LIS curricula to reflect the competencies required in contemporary information ecosystems.

From an international perspective, professional bodies such as the International Federation of Library Associations and Institutions (IFLA) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) emphasize the need for LIS education to be dynamic, inclusive, and responsive to technological and societal changes. These organizations advocate for digital literacy, lifelong learning, innovation, and the development of relevant competencies in education and professional practice [12]. However, despite these global frameworks, their implementation varies significantly across regions due to disparities in resources, institutional priorities, and policy environments [12].

A key area of scholarly debate concerns the balance between traditional LIS foundations and emerging technological competencies. While some scholars caution against neglecting core principles such as cataloguing and classification [7], others argue that insufficient attention to emerging technologies can constrain the relevance of LIS education, particularly in developing countries [3]. This tension underscores the need for LIS programmes to evolve while maintaining their disciplinary identity.

Institutional readiness has been widely identified as a critical factor in the successful integration of technology into education. Globally, universities are increasingly adopting digital transformation strategies, including curriculum redesign, policy development, and investment in ICT infrastructure [5]. These initiatives are often supported by institutional leadership and strategic planning, which facilitate the effective incorporation of emerging technologies into teaching and learning.

However, the situation in Nigeria, particularly in South-East LIS schools, presents a contrasting reality. Although some institutions have initiated efforts to modernize their programmes, institutional readiness remains uneven. Curriculum development and review processes continue to present challenges that can affect the timely integration of emerging technologies [2, 8]. Similarly, institutional readiness for technology-supported education may be influenced by the availability of infrastructure, institutional policies, and the capacity of staff to implement technology-based teaching and learning [14].

Human capacity, particularly the digital competencies of LIS educators, represents another critical dimension. Globally, there is growing recognition that educators require adequate digital competencies to effectively use learning technologies, digital resources, and emerging technologies in teaching and professional practice. In Nigeria, empirical evidence indicates that ICT skills and digital competencies remain important areas for professional development among library and information professionals [10, 11]. Ogunmodede and Emeahara [15] further emphasize the importance of continuous professional development and ICT skills acquisition among librarians. These competency gaps may be influenced by limited access to training opportunities and technological resources. Consequently, strengthening human capacity is essential for ensuring that LIS educators can effectively integrate emerging technologies into instruction and professional practice.

The technological relevance of LIS curricula remains a critical issue in contemporary LIS education. Globally, there is a clear shift toward integrating digital librarianship, information technology, and other emerging technological competencies into programmes designed to prepare graduates for modern information environments [3, 6]. In Nigeria, however, curriculum modernization remains inconsistent.

Studies have examined the integration of ICT and digital library education within Nigerian LIS curricula and highlighted the continuing need to strengthen the technological orientation of LIS programmes [2, 16]. This suggests that technological relevance extends beyond curriculum content to include methods of delivery and opportunities for practical engagement.

Closely related to this is the issue of infrastructure, which underpins technology-driven education. Globally, universities have invested in digital infrastructure to support teaching, research, and innovation [5]. In contrast, infrastructural challenges remain a concern in Nigerian educational and library environments, including inadequate ICT facilities, unreliable internet connectivity, and limited access to relevant technological resources [13]. While infrastructure is necessary for technology-oriented education, its effectiveness also depends on the competencies of users and the institutional capacity to manage and utilize available resources [10, 15].

The challenges facing LIS education in Nigeria are therefore multifaceted, encompassing inadequate funding, curriculum development challenges, limited digital competencies, infrastructural constraints, and institutional limitations [2, 8, 10, 13]. Although there is broad recognition of the need for reform, the most effective strategies require attention to both institutional and individual capacity. A combination of curriculum modernization, infrastructure development, professional development, and institutional support is therefore necessary to strengthen LIS education and improve the preparation of information professionals for contemporary technological environments.

Despite the growing body of literature, significant gaps remain. Most studies in Nigeria focus on isolated variables such as curriculum, ICT skills, or infrastructure, with limited attention to their interrelationships. This fragmented approach constrains a holistic understanding of LIS education. Furthermore, there is a scarcity of empirical studies focusing specifically on South East Nigeria, despite its concentration of LIS schools. This study addresses these gaps by providing an integrated analysis of institutional readiness, human capacity, and technological relevance within LIS schools in South East Nigeria.

2.2. Methodology

This study adopted a descriptive survey research design to examine the state of Library and Information Science (LIS) schools in preparing library educators and information professionals for 21st-century technologies in South East Nigeria. The design was considered appropriate as it enables systematic collection and analysis of data without manipulation of variables, thereby providing a realistic assessment of existing conditions in LIS education. The study was conducted in South East Nigeria, comprising Abia, Anambra, Ebonyi, Enugu, and Imo States, where accredited universities offer LIS programmes, including Michael Okpara University of Agriculture, Umudike; Chukwuemeka Odumegwu Ojukwu University; and the University of Nigeria, Nsukka. The population of the study consisted of 160 LIS educators in these institutions, who are directly involved in curriculum delivery and the integration of emerging technologies in teaching and learning. A purposive sampling technique was used to select universities offering LIS programmes, while simple random sampling was employed to select lecturers within the selected institutions to ensure representativeness. Since the population was relatively small and manageable, all 160 LIS educators were included in the study, making 160 respondents of the sample size. Data was collected using a structured questionnaire developed based on the study objectives. A structured questionnaire titled *Preparation of Library Educators and Information Professionals for 21st-Century Technologies Questionnaire (PLEIPTQ)* was used for data collection. The instrument was validated by experts in Library and Information Science, while its reliability The reliability of the instrument was established through a pilot test using Cronbach's alpha, yielding a reliability coefficient of 0.84. Data collection was carried out through direct administration and retrieval of the questionnaire with the assistance of trained research assistants. Data was analyzed using descriptive statistics, specifically mean

and standard deviation, to answer the research questions. A decision rule of 2.50 was adopted as the benchmark for determining agreement or disagreement among respondents. 160 questionnaires were distributed but 155 questionnaires were retrieved and used for data analysis.

2.3. Demographic Variables

Table 1. *Distribution of Respondents by Gender (N=158).*

Gender	Frequency	Percentage (%)
Male	76	48.1
Female	82	51.9
Total	158	100.0

Table 1 shows the distribution of respondents by gender. The result indicates that 82 respondents (51.9%) were female, while 76 respondents (48.1%) were male. This implies that female respondents constituted a slightly higher proportion of the study population than their male counterparts.

Table 2. *Distribution of Respondents by Educational Qualification (N=158).*

Educational Qualification	Frequency (f)	Percentage (%)
BLS/BLIS	16	10.1
MLS/MLIS	86	54.4
PhD	56	35.4
Others	0	0.0
Total	158	100.0

Table 2 shows the distribution of respondents by educational qualification. The result indicates that 86 respondents (54.4%) possessed MLS/MLIS degrees, 56 respondents (35.4%) held PhD degrees, while 16 respondents (10.1%) possessed BLS/BLIS qualifications. None of the respondents indicated any other qualification.

Table 3. *Distribution of Respondents by Years of Experience (N=158).*

Years of Experience	Frequency (f)	Percentage (%)
1–5 years	28	17.7
6–10 years	42	26.6
11–15 years	46	29.1
16 years and above	42	26.6
Total	158	100.0

Table 3 shows the distribution of respondents by years of experience. The result indicates that 46 respondents (29.1%) had 11–15 years of experience, 42 respondents (26.6%) each had 6–10 years and 16 years and above, while 28 respondents (17.7%) had 1–5 years of experience.

Table 4. *Distribution of Respondents by Status (N=158).*

Designation	Frequency (f)	Percentage (%)
Lecturer	49	31.0
Librarian	93	58.9
Graduate Assistant	16	10.1
Others	0	0.0
Total	158	100.0

Table 4 shows the distribution of respondents by status. The result indicates that 93 respondents (58.9%) were Librarians, 49 respondents (31.0%) were Lecturers, while 16 respondents (10.1%) were Graduate Assistants. None of the respondents indicated any other designation.

Table 5. *Distribution of Respondents by Institution (N = 158).*

Institution	Frequency (f)	Percentage (%)
Michael Okpara University of Agriculture, Umudike	52	32.9
Chukwuemeka Odumegwu Ojukwu University	51	32.3
University of Nigeria, Nsukka	55	34.8
Total	158	100.0

Table 5 shows the distribution of respondents by institution. The result indicates that 55 respondents (34.8%) were from the University of Nigeria, Nsukka, 52 respondents (32.9%) were from Michael Okpara University of Agriculture, Umudike, while 51 respondents (32.3%) were from Chukwuemeka Odumegwu Ojukwu University.

3. Results and Findings

Table 6. *Summary of mean and standard deviation on the level of institutional readiness of LIS schools in South East Nigeria for integrating 21st-century technologies into teaching and learning.*

S/N	Items	SA	A	D	SD	Mean	S/D	Decision
1	LIS curriculum in my institution reflects current technological trends	72	58	18	10	3.22	0.82	Agreed
2	My institution has policies supporting integration of digital technologies in teaching	68	60	20	10	3.18	0.81	Agreed
3	There is institutional support for e-learning and blended learning	65	61	22	10	3.15	0.83	Agreed
4	Regular curriculum review incorporates emerging technologies	70	56	21	11	3.17	0.85	Agreed
5	Management is committed to technological advancement in LIS education	74	55	19	10	3.22	0.81	Agreed
	Grand Mean/S/D					3.19	0.82	Agreed

Table 6 shows the mean and standard deviation on the level of institutional readiness of LIS schools in South East Nigeria for integrating 21st-century technologies into teaching and learning. All the items recorded mean scores above the benchmark mean of 2.50, indicating respondents' agreement that their institutions are ready for technology integration. The highest mean score of 3.22 (SD=0.82) was recorded for both the LIS curriculum reflecting current technological trends and management's commitment to technological advancement, while the lowest mean score of 3.15 (SD=0.83) was recorded for institutional support for e-learning and blended learning. The grand mean of 3.19 (SD=0.82) indicated that LIS schools in South East Nigeria demonstrate a high level of institutional readiness for integrating 21st-century technologies into teaching and learning.

Table 7. *Summary of mean and standard deviation on the digital competencies (human capacity) of LIS educators in relation to the use of emerging technologies for instruction and professional practice.*

S/N	Items	SA	A	D	SD	Mean	S/D	Decision
1	LIS educators are proficient in the use of digital teaching tools	70	60	18	10	3.20	0.82	Agreed
2	Educators can effectively use learning management systems (e.g., Moodle, Google Classroom	66	61	21	10	3.16	0.83	Agreed
3	Educators are skilled in applying emerging technologies (AI, data tools) in teaching	68	58	22	10	3.16	0.84	Agreed
4	There are opportunities for continuous professional development in ICT	65	60	23	10	3.14	0.84	Agreed
5	Educators integrate digital tools into classroom instruction	30	50	45	33	2.49	0.95	Disagreed
	Grand Mean/S/D					3.03	0.86	Agreed

Table 7 shows the mean and standard deviation on the digital competencies (human capacity) of LIS educators in relation to the use of emerging technologies for instruction and professional practice. Four of the five items recorded mean scores above the benchmark mean of 2.50, indicating respondents' agreement, while one item recorded a mean score below

2.50, indicating disagreement. The highest mean score of 3.20 (SD = 0.82) was recorded for LIS educators being proficient in the use of digital teaching tools, while the lowest mean score of 2.49 (SD = 0.95) was recorded for educators integrating digital tools into classroom instruction. The grand mean of 3.03 (SD = 0.86) showed that LIS educators possess adequate digital competencies for the use of emerging technologies in instruction and professional practice.

Table 8. *Summary of mean and standard deviation on the technological relevance of LIS curricula in reflecting 21st-century technological tools and trends.*

S/N	Items	SA	A	D	SD	Mean	S/D	Decision
1	Courses on digital librarianship are included in the curriculum	71	59	18	10	3.21	0.82	Areed
2	The curriculum includes training on data management and analytics	28	48	48	34	2.44	0.96	Disagreed
3	Emerging technologies (AI, IoT, cloud computing) are taught	68	60	20	10	3.18	0.82	Agreed
4	Students are exposed to practical digital tools used in libraries	29	49	46	34	2.46	0.95	Disagreed
5	Curriculum prepares students for modern digital library environments	70	58	20	10	3.19	0.82	Agreed
	Grand Mean/S/D					2.90	0.87	Agreed

Table 8 shows the mean and standard deviation on the technological relevance of LIS curricula in reflecting 21st-century technological tools and trends. Three of the five items recorded mean scores above the benchmark mean of 2.50, indicating agreement, while two items recorded mean scores below 2.50, indicating disagreement. The highest mean score of 3.21 (SD=0.82) was recorded for courses on digital librarianship being included in the curriculum, while the lowest mean score of 2.44 (SD=0.96) was recorded for the curriculum including training on data management and analytics. The grand mean of 2.90 (SD=0.87) revealed that LIS curricula are technologically relevant and reflect 21st-century technological tools and trends, although gaps remain in data management training and students' exposure to practical digital tools.

Table 9. *Summary of mean and standard deviation on the availability and adequacy of ICT infrastructure for practical training in LIS schools in South East Nigeria.*

S/N	Items	SA	A	D	SD	Mean	S/D	Decision
1	Functional computer laboratories are available for LIS students	69	60	19	10	3.19	0.82	Agreed
2	Internet access is reliable and sufficient for academic use	66	61	21	10	3.16	0.83	Agreed
3	Relevant software tools (e.g., Koha, DSpace) are available	68	59	21	10	3.17	0.83	Agreed
4	There is adequate access to digital library resources	70	58	20	10	3.19	0.82	Agreed
5	ICT facilities support practical learning effectively	67	60	21	10	3.16	0.83	Agreed
	Grand Mean/S/D					3.17	0.83	Agreed

Table 9 shows the mean and standard deviation on the availability and adequacy of ICT infrastructure for practical training in LIS schools in South East Nigeria. All the items recorded mean scores above the benchmark mean of 2.50, indi-

cating respondents' agreement that ICT infrastructure is available and adequate for practical training. The highest mean score of 3.19 was recorded for both functional computer laboratories being available for LIS students (SD=0.82) and adequate access to digital library resources (SD=0.82), while the lowest mean score of 3.16 was recorded for reliable internet access (SD = 0.83) and ICT facilities supporting practical learning effectively (SD=0.83). The grand mean of 3.17 (SD = 0.83) revealed that LIS schools in South East Nigeria have adequate ICT infrastructure to support practical training.

Table 10. *Summary of mean and standard deviation on the challenges hindering effective preparation of library educators and information professionals for 21st-century technologies.*

S/N	Items	SA	A	D	SD	Mean	S/D	Decision
1	Inadequate funding affects technology integration	74	56	18	10	3.23	0.81	Agreed
2	Lack of ICT infrastructure hinders effective teaching	70	59	19	10	3.19	0.82	Agreed
3	Limited digital skills among educators affect teaching quality	68	60	20	10	3.18	0.82	Agreed
4	Resistance to change affects adoption of new technologies	66	61	21	10	3.16	0.83	Agreed
5	Poor internet connectivity limits access to digital resources	72	58	18	10	3.22	0.81	Agreed
	Grand Mean/S/D					3.20	0.82	Agreed

Table 10 shows the mean and standard deviation on the challenges hindering the effective preparation of library educators and information professionals for 21st-century technologies. All the items recorded mean scores above the benchmark mean of 2.50, indicating respondents' agreement that the listed factors are major challenges. The highest mean score of 3.23 (SD=0.81) was recorded for inadequate funding affecting technology integration, while the lowest mean score of 3.16 (SD=0.83) was recorded for resistance to change affecting the adoption of new technologies. The grand mean of 3.20 (SD=0.82) showed that inadequate funding, poor ICT infrastructure, limited digital skills, resistance to change, and poor internet connectivity are major challenges hindering the effective preparation of library educators and information professionals for 21st-century technologies.

Table 11. *Summary of mean and standard deviation on the strategies for improving LIS education in line with global technological advancements.*

S/N	Items	SA	A	D	SD	Mean	S/D	Decision
1	Regular training should be organized for LIS educators	76	54	18	10	3.24	0.80	Agreed
2	LIS curriculum should be updated frequently	72	57	19	10	3.21	0.81	Agreed
3	Government should increase funding for ICT infrastructure	78	52	18	10	3.25	0.80	Agreed
4	Collaboration with international institutions should be encouraged	70	59	19	10	3.19	0.82	Agreed
5	Adoption of modern technologies should be prioritized in LIS schools	74	56	18	10	3.23	0.81	Agreed
	Grand Mean/S/D					3.22	0.81	Agreed

Table 11 shows the mean and standard deviation on the strategies for improving LIS education in line with global technological advancements. All the items recorded mean scores above the benchmark mean of 2.50, indicating respondents' agreement that the listed measures are effective strategies for improving LIS education. The highest mean score of 3.25 (SD=0.80) was recorded for government increasing funding for ICT infrastructure, while the lowest mean score of 3.19 (SD=0.82) was recorded for encouraging collaboration with international institutions. The grand mean of 3.22 (SD=0.81)

indicated that regular training for LIS educators, frequent curriculum updates, increased government funding, international collaboration, and the adoption of modern technologies are essential strategies for improving LIS education in line with global technological advancements.

4. Discussion of Findings

The findings revealed that LIS schools in South-East Nigeria are institutionally prepared to adopt 21st-century-oriented approaches to teaching and learning, as indicated by a grand mean of 3.19. Respondents indicated that their institutions have technology-oriented curricula, supportive policies, regular curriculum review, and management commitment to technological advancement. This finding is consistent with Abubakar and Maidabino [1], who observed that LIS schools in Nigeria have increasingly adapted their programmes to emerging digital trends through curriculum reforms and institutional support. It also supports the findings of Okeji and Mayowa-Adebara [16], which indicated that efforts are being made by LIS schools to modernize their programmes, although the level of readiness varies among institutions depending on available resources and administrative commitment.

The results further showed that LIS educators possess a relatively good level of digital competency in the application of emerging technologies, with a grand mean of 3.03. However, there was a lack of consensus regarding the extent to which educators incorporate digital tools into their teaching. This suggests that possessing basic digital competencies does not necessarily translate into consistent or effective integration of digital technologies into classroom instruction. The finding is broadly consistent with studies on digital competencies among library and information professionals, which emphasize the importance of both technological skills and institutional support in the effective application of digital tools [10, 11]. It also reinforces the importance of continuous professional development in strengthening educators' ability to apply ICT skills effectively in teaching and learning [15].

The study revealed that the LIS curriculum is relatively relevant to current technological trends, as reflected by a grand mean of 2.90. However, respondents indicated that insufficient attention is given to areas such as data management, data analytics, and real-world digital tools. This finding is consistent with Okeji and Mayowa-Adebara [16], who examined digital library education within Nigerian LIS curricula and highlighted the importance of strengthening the digital orientation of LIS education. It also supports the argument that curriculum modernization should go beyond the introduction of ICT-related courses to include adequate practical exposure to emerging technologies and their applications in contemporary information environments [2, 3]. The finding therefore suggests that although technological content has been incorporated into LIS curricula, further curriculum development is necessary to ensure that graduates acquire the practical competencies required in an increasingly technology-driven professional environment.

The results showed that ICT infrastructure for practical training is generally available and adequate, with a grand mean of 3.17. Respondents indicated that computer laboratories, internet facilities, digital library resources, and library computer software were available to facilitate teaching and learning. This finding is consistent with Nwachukwu, Eke, and Ozioko [13], who examined ICT infrastructure in Nigerian university libraries and highlighted the importance of technological facilities in supporting library services and related activities. However, the availability of infrastructure does not necessarily imply that such facilities are uniformly adequate across all institutions. Differences in funding, maintenance, internet connectivity, and institutional support may influence the effective utilization and sustainability of available ICT facilities.

The study further revealed that inadequate funding, poor ICT infrastructure, limited digital skills, resistance to change, and poor internet connectivity constitute significant challenges to the preparation of library educators and information professionals, with a grand mean of 3.20. These findings are consistent with the challenges identified in studies of LIS education and curriculum development in Nigeria [2, 8]. They also reinforce the importance of adequate ICT skills and continuous professional development among library and information professionals [10, 15]. The findings suggest that improving LIS education requires not only curriculum reform but also sustained investment in infrastructure, staff development, and institutional support.

Finally, the study findings indicated that regular staff training, curriculum review, increased government funding, international collaboration, and the application of modern technologies are important strategies for improving LIS education, with a grand mean of 3.22. These findings support the emphasis placed on continuous professional development and ICT skills acquisition among library professionals [15]. They are also consistent with the need for curriculum innovation and technological integration in Nigerian LIS education [2, 3]. Regular curriculum review and staff training can help educators remain abreast of emerging technologies, while increased investment in ICT infrastructure can provide the facilities required for practical training. International collaboration can further expose LIS educators and students to global developments and innovative practices in LIS education.

Overall, the findings indicate that LIS schools in South-East Nigeria have made progress toward becoming 21st-century-oriented institutions, particularly in terms of institutional readiness, digital competencies, curriculum relevance, and ICT infrastructure. Nevertheless, gaps remain in the practical integration of emerging technologies, staff digital competencies, infrastructure sustainability, and institutional support. Addressing these gaps through continuous professional development, curriculum modernization, adequate funding, infra-

structure improvement, and strategic collaboration will be essential for strengthening the capacity of LIS schools to prepare library educators and information professionals for the demands of the digital age.

5. Recommendations

Based on the findings of the study, the following recommendations were made:

1) LIS schools should regularly review their policies to support the integration of emerging technologies into teaching and learning.
2) University management should provide continuous ICT training to improve the digital competencies of LIS educators.
3) LIS curricula should be updated regularly to include practical training in emerging technologies and digital skills.
4) Government and university authorities should increase funding for ICT infrastructure and digital learning resources.
5) Universities should improve internet connectivity and encourage the adoption of modern technologies among educators.
6) LIS schools should strengthen collaboration with professional bodies and international institutions to enhance curriculum development and staff capacity building.

Abbreviations

AI	Atificial Intelligence
ICT	Information and Communication Technology
IFLA	International Federation of Library Associations and Institutions
IoT	Internet of Things
LIS	Library and Information Science
UNESCO	United Nation Educational, Scientific And Cultural Organization

Authors Contributions

Caroline Amarachi Okoro: Conceptualization, Funding acquisition, Project administration, Resources, Supervision, Writing – original draft

Victor Wagwu: Funding acquisition, Investigation, Methodology, Resources, Writing – review & editing

Wonu Anele Kenenth: Data curation, Formal Analysis, Funding acquisition, Software, Visualization

Conflicts of Interest

The authors declared no conflicts of interest.

Appendix

Please tick (✓) the option that best represents your opinion. All responses will be treated with strict confidentiality and used for academic purposes only.

Section A: Demographic Information

Gender:

☐ Male ☐ Female

Academic Qualification:

☐ BLS/BLIS ☐ MLS/MLIS ☐ PhD ☐ Others (Specify) _____

Status:

☐ Lecturer ☐ Librarian ☐ Graduate Assistant ☐ Others _____

Years of Experience:

☐ 1–5 ☐ 6–10 ☐ 11–15 ☐ 16 and above

Institution: _____

Instruction: Indicate your level of agreement using:

SA = Strongly Agree | A = Agree | D = Disagree | SD = Strongly Disagree

Section B:

Table 12. *level of institutional readiness of LIS schools in South East Nigeria for integrating 21st-century technologies into teaching and learning.*

S/N	ITEM	SA	A	SD	D
1	LIS curriculum in my institution reflects current technological trends				
2	My institution has policies supporting integration of digital technologies				

S/N	ITEM	SA	A	SD	D
	in teaching				
3	There is institutional support for e-learning and blended learning				
4	Regular curriculum review incorporates emerging technologies				
5	Management is committed to technological advancement in LIS education				

Section C: Human Capacity (Digital Competencies of Educators)
Instruction: Indicate your level of agreement using:
SA = Strongly Agree | A = Agree | D = Disagree | SD = Strongly Disagree

Table 13. *Digital competencies (human capacity) of LIS educators in relation to the use of emerging technologies for instruction and professional practice.*

S/N	ITEM	SA	A	SD	D
6	LIS educators are proficient in the use of digital teaching tools				
7	Educators can effectively use learning management systems (e.g., Moodle, Google Classroom				
8	Educators are skilled in applying emerging technologies (AI, data tools) in teaching				
9	There are opportunities for continuous professional development in ICT				
10	Educators integrate digital tools into classroom instruction				

Section D: Technological Relevance of Curriculum
Instruction: Indicate your level of agreement using:
SA = Strongly Agree | A = Agree | D = Disagree | SD = Strongly Disagree

Table 14. *Technological relevance of LIS curricula in reflecting 21st-century technological tools and trends.*

S/N	ITEM	SA	A	SD	D
11	Courses on digital librarianship are included in the curriculum				
12	The curriculum includes training on data management and analytics				
13	Emerging technologies (AI, IoT, cloud computing) are taught				
14	Students are exposed to practical digital tools used in libraries				
15	Curriculum prepares students for modern digital library environments				

Section E: ICT Infrastructure
Instruction: Indicate your level of agreement using:
SA = Strongly Agree | A = Agree | D = Disagree | SD = Strongly Disagree

Table 15. Availability and adequacy of ICT infrastructure for practical training in LIS schools in South East Nigeria.

S/N	ITEM	SA	A	SD	D
16	Functional computer laboratories are available for LIS students				
17	Internet access is reliable and sufficient for academic use				
18	Relevant software tools (e.g., Koha, DSpace) are available				
19	There is adequate access to digital library resources				
20	ICT facilities support practical learning effectively				

Section F: Challenges
Instruction: Indicate your level of agreement using:
SA = Strongly Agree | A = Agree | D = Disagree | SD = Strongly Disagree

Table 16. Challenges hindering effective preparation of library educators and information professionals for 21st-century technologies.

S/N	ITEM	SA	A	SD	D
21	Inadequate funding affects technology integration				
22	Lack of ICT infrastructure hinders effective teaching				
23	Limited digital skills among educators affect teaching quality				
24	Resistance to change affects adoption of new technologies				
25	Poor internet connectivity limits access to digital resources				

Section G: Strategies for Improvement
Instruction: Indicate your level of agreement using:
SA = Strongly Agree | A = Agree | D = Disagree | SD = Strongly Disagree

Table 17. Strategies for improving LIS education in line with global technological advancements.

S/N	ITEM	SA	A	SD	D
26	Regular training should be organized for LIS educators				
27	LIS curriculum should be updated frequently				
28					
29	Government should increase funding for ICT infrastructure				
30	Collaboration with international institutions should be encouraged				
31	Adoption of modern technologies should be prioritized in LIS schools				

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