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ICT COMPETENCIES OF LIBRARY AND INFORMATION SCIENCE STUDENTS OF IMO STATE UNIVERSITY OWERRI

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Abstract

This study focuses on ICT competencies of library and information science students of Imo State University Owerri. Four research objectives and four research questions were posed to guide the study. The study adopted a survey research design. The study was carried out in Imo State University Owerri. The population of the study is 285 students of library and information science in Imo State University, Owerri. The sample of the study is 100. The

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sample was randomly selected from the entire population. In this study, the researcher used rating scale as the instrument for data collection. The data collected for this study were analyzed using mean score. The findings revealed among others that information technology (IT) skills, database management skills, web development skills, social media skills, and data analysis skills are the ICT competencies of LIS students in Imo State University Owerri; database management and digital librarianship, are effective in helping LIS students improve their ICT competencies in Imo State University. Based on the findings, it was recommended among others that the university management should encourage the of LIS students to acquire more ICT skills so as to enable them become productive during practice and other ICT related courses should be encouraged so as to help LIS students improve their ICT competencies in Imo State University

Keywords: Information and Communication Technology, Library and Information Science, ICT competence, Students

Introduction

Information and Communication Technology (ICT) refers to the use of electronic technologies, devices, and systems for the collection, processing, storage, retrieval, transmission, and dissemination of information. These technologies include computers, internet facilities, audiovisual equipment, digital storage devices, software applications, telecommunications systems, and other electronic tools that facilitate communication and information management. ICT has transformed the way information is created, accessed, organized, and shared across various sectors, including education, business, healthcare, and libraries. According to McAlbert and Uzoeto (2016), ICT is a broad concept that encompasses computer technologies, communication systems, and microelectronic technologies used for information processing and exchange. Similarly, Yusuf (2017) described ICT as a collection of technologies, applications, and services used in producing,

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processing, storing, and distributing information. These technologies have become indispensable in modern society due to their ability to improve efficiency, accuracy, and accessibility of information.

The rapid advancement of ICT has significantly changed educational systems and information service delivery worldwide. Today, many countries regard ICT literacy as a fundamental skill comparable to reading, writing, and numeracy. The emergence of digital technologies has gradually replaced many traditional methods of communication and information management. Toyese, Oyewumi, and Akanbi (2018) observed that ICT is one of the greatest innovations of humanity, playing a crucial role in transforming organizational activities and information services, including those offered by libraries.

In the library and information science profession, ICT has become an essential tool for effective service delivery. ICT facilitates faster access to information resources, improves communication between libraries and users, enhances information retrieval processes, and supports the development of digital libraries. Ezeani and Ekere (2009) noted that ICT promotes innovation and continuous learning within academic environments while redefining traditional library services. Libraries that effectively utilize ICT can provide more efficient, user-centered, and responsive services to meet the needs of contemporary information users.

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The increasing dependence on digital information resources has created a need for library professionals to possess adequate ICT competencies. Narasappa and Kumar (2016) emphasized that ICT skills are necessary for library personnel to remain relevant in an increasingly digital information environment. The opportunities presented by the information age can only be fully realized when library professionals acquire the required technological competencies and skills.

ICT competency refers to the ability of individuals to effectively use digital technologies to access, manage, evaluate, create, and communicate information. According to the International Telecommunication Union (2012), ICT competency encompasses technical knowledge, digital literacy, problem-solving abilities, and the practical application of technological tools in various contexts. These competencies enable individuals to function effectively in academic, professional, and social environments increasingly driven by technology.

Recognizing the importance of ICT competencies, universities offering Library and Information Science (LIS) programmes have revised their curricula to incorporate technology-related courses. LIS programmes now emphasize areas such as database management, digital libraries, information retrieval systems, and digital resource management. These courses equip students with the knowledge and skills required to organize, store, retrieve, and manage digital information resources effectively.

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Furthermore, students are exposed to digital library development, digitization processes, and digital preservation techniques that enable them to manage electronic collections and online information resources. Training in information retrieval systems helps students develop the ability to locate and provide access to relevant information across various digital platforms. In addition, knowledge of metadata standards such as Dublin Core and Machine-Readable Cataloguing (MARC) enables future librarians to organize digital resources systematically and facilitate efficient information discovery.

ICT competencies can be acquired through several means, including formal education, practical training, self-directed learning, online courses, workshops, mentorship, and continuous professional development programmes. Formal education, practical experience, and lifelong learning are the major avenues for developing ICT skills. Similarly, Kotler, Kumar and Scheer (2020) emphasized that academic institutions play a significant role in providing students with opportunities to develop technological competencies through structured learning experiences.

Despite the growing importance of ICT competencies, several factors hinder their acquisition among LIS students. Nkhoma and Dang (2020) identified challenges such as inadequate prior technological experience, computer anxiety, technophobia, and differences in educational backgrounds. Additionally, Mune and Agee (2021) reported that poorly integrated ICT curricula, inadequate technological infrastructure, limited access to

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hardware and software resources, unreliable internet connectivity, and insufficiently trained instructors can negatively affect students' acquisition of ICT skills.

Given the central role of ICT in modern library operations and information service delivery, it is essential for LIS students to acquire the necessary competencies required for effective professional practice. The acquisition of these competencies will enable future librarians to adapt to technological changes, manage digital resources efficiently, and meet the evolving information needs of users. It is against this background that the present study investigates the ICT competencies of Library and Information Science students of Imo State University, Owerri.

Statement of the Problem

The rapid advancement of Information and Communication Technology (ICT) has profoundly transformed the landscape of library and information services. Consequently, Library and Information Science (LIS) professionals are now required to possess a robust set of ICT competencies to effectively manage digital resources, facilitate access to information, and support user needs in an increasingly digital environment. Despite the critical importance of these skills, there is growing concern that many LIS students graduating from universities may not be adequately prepared to meet these demands. The researcher therefore wonders if this as a result of inadequate coverage of ICT related

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courses in the curriculum or inadequacy to acquire the necessary competencies by LIS students.

Given the pivotal role that ICT plays in contemporary library and information services, it is imperative to systematically analyze the current state of ICT competencies among LIS students in universities. This analysis will help identify the specific gaps and challenges faced by students, providing a basis for developing targeted interventions to enhance ICT education in LIS programs.

Research Questions

Based on the objectives of the study, the following research questions are posed to guide the study

1. What are the ICT competencies of LIS students in Imo State University Owerri?;
2. What are the effectiveness of existing ICT-related courses in helping LIS students improve their ICT competencies?;
3. What are the ways of acquiring ICT competencies by the students?;
4. What are the key challenges that hinder the acquisition of ICT skills among LIS students?

Literature

Information and Communication Technology (ICT)

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Information and Communication Technology (ICT) refers to the application of electronic technologies for the creation, processing, storage, retrieval, transmission, and dissemination of information. It encompasses a wide range of technologies such as computers, software applications, telecommunications systems, networks, and internet services. ICT has transformed virtually every sector of society, including education, healthcare, business, governance, and library services. According to the United Nations Development Programme as cited in Osuagwu, Amadi and Unamma (2026), ICT serves as a powerful tool for economic development, global participation, improved service delivery, and enhanced communication. ICT is a major driver of economic growth, social development, and innovation across the world. ICT contributes immensely to the growth of organizations.

The emergence of ICT has revolutionized the way information is managed and accessed. Through digital technologies, information can be generated, stored, processed, and shared rapidly and accurately regardless of geographical location. In education, ICT has facilitated the development of online learning platforms, virtual classrooms, and digital resources that have improved access to knowledge and learning opportunities (Ally, 2019). In healthcare, technologies such as telemedicine, electronic health records, and remote consultations have enhanced healthcare delivery and efficiency (WHO, 2019). Despite these benefits, challenges such as cybercrime, digital inequality, and privacy concerns continue to affect ICT adoption and utilization globally.

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In the library and information sector, ICT has significantly transformed traditional library operations and service delivery. Modern libraries now utilize ICT tools for cataloguing, circulation management, information retrieval, reference services, and digital resource management. Spacey, Goulding, and Murray (2013) observed that ICT has enhanced librarians' efficiency in organizing and disseminating information resources. Through the internet and digital platforms, library users can conveniently access electronic journals, e-books, databases, institutional repositories, and other online resources from any location (Davis, 2011). Consequently, ICT has become an indispensable component of contemporary library services.

Library and Information Science (LIS) students are individuals undergoing professional training in the principles and practices of information organization, management, preservation, and dissemination. According to the American Library Association (ALA, 2020), Library and Information Science is an interdisciplinary field that integrates aspects of information technology, social sciences, management, and education to facilitate access to information resources. LIS students are trained to become professionals capable of working in libraries, archives, museums, information centres, and digital information environments.

The rapidly changing information landscape has increased the demand for technologically competent LIS graduates. Buckland (2017) noted that modern information

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professionals require not only traditional library skills but also technological competencies that enable them to manage digital resources and provide electronic information services. Consequently, LIS programmes now incorporate courses in information technology, digital libraries, database management, information retrieval systems, and digital preservation. These courses prepare students to operate effectively within technologically driven information environments.

ICT Competencies of LIS Students

ICT competencies refer to the knowledge, skills, and abilities required to effectively utilize information and communication technologies for academic, professional, and personal purposes. For LIS students, ICT competencies are essential because future library services are increasingly dependent on digital technologies. The American Library Association (2020) identified several critical ICT competencies required by LIS students. These competencies are necessary for the growth of the profession.

One of the most important competencies is Information Technology Skills. These include proficiency in computer applications such as Microsoft Word, Excel, PowerPoint, database systems, operating systems, cloud computing platforms, and networking technologies. Such skills enable LIS students to manage information resources efficiently and provide effective support services to library users.

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Another vital competency is Database Management Skills. Libraries rely heavily on databases for storing, organizing, and retrieving information resources. LIS students are therefore expected to understand database design, data modelling, querying techniques, database security, indexing, and information retrieval processes. Rubin (2018) emphasized that database management skills are fundamental to effective information organization and access.

Web Development Skills have also become increasingly important. Modern libraries maintain websites, institutional repositories, and digital platforms through which users access information resources. According to Buckland (2017), knowledge of web technologies such as HTML, CSS, JavaScript, and content management systems enables LIS students to participate actively in the development and maintenance of digital information services.

Additionally, Social Media Skills are necessary for promoting library services, engaging users, and creating awareness about available resources. Social media platforms provide libraries with opportunities to interact directly with users, market their services, and disseminate information effectively (Hernandez, 2019). They provide easy access to connecting with the library users so as to enable them have access to their information needs.

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Another critical competency is data analysis skills. According to Tenopir (2015), libraries increasingly rely on data for decision-making, assessment of services, and understanding user needs. Data analysis skills enable LIS students to collect, interpret, visualize, and utilize data for evidence-based decision-making and service improvement.

The COVID-19 pandemic further demonstrated the importance of ICT competencies among LIS professionals. Libraries were compelled to adopt virtual services, online reference systems, digital learning support, and remote access technologies. Consequently, ICT competencies have become indispensable requirements for effective library and information service delivery in the contemporary digital environment.

ICT-Related Courses and Training in LIS Curriculum

To prepare students for modern professional demands, universities have integrated ICT-related courses into LIS curricula. Kotler, Kumar and Scheer (2020) reported that many LIS programmes now include courses such as database management, web development, digital librarianship, information systems, and digital preservation.

Database management courses equip students with the skills needed to design, implement, and maintain information databases. According to Rubin (2018), database management is a critical skill for librarians, hence web development courses provide them with knowledge of website design and digital service delivery. Chowdhury and Chowdhury (2017) stated that digital libraries are becoming increasingly important and digital

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librarianship courses focus on the management of electronic collections, digital repositories, digitization processes, and electronic information services. Furthermore, many institutions now offer training in emerging technologies such as artificial intelligence, machine learning, data analytics, and cloud computing, reflecting the changing nature of information management and service delivery.

Online learning platforms have also contributed significantly to ICT competency development. These platforms provide flexible opportunities for students to acquire practical technological skills, access instructional materials, and participate in virtual learning activities regardless of location.

Ways of Acquiring ICT Competencies

ICT competencies can be acquired through various approaches. Formal education remains one of the most common methods, as universities and colleges provide structured learning opportunities through degree programmes and professional courses. These programmes expose students to theoretical knowledge and practical applications of ICT tools and technologies.

Online learning platforms such as Coursera, edX, and Udemy have also become important sources of ICT training. These platforms offer flexible and affordable courses that enable learners to acquire specialized technological skills at their own pace. Workshops, seminars, and professional development programmes organized by

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educational institutions and professional associations provide additional opportunities for practical skill acquisition.

Self-directed learning is another effective means of acquiring ICT competencies. Through online tutorials, videos, blogs, manuals, and digital resources, students can independently develop their technological knowledge and skills. Hernandez (2019) stated that self-directed learning is an effective way to acquire ICT competencies, as it provides individuals with the flexibility to learn whenever and wherever they want. Mentorship programmes and industrial training opportunities further enable students to gain practical experience from experienced professionals. According to Tenopir (2015) many organizations, such as libraries, museums, and archives, offer mentorship programs that pair individuals with experienced professionals which is a way of helping them grow. Participation in online communities, professional forums, and social media groups also facilitates knowledge sharing, collaboration, and continuous learning.

Hindrances to the Acquisition of ICT Skills among LIS Students

Despite the importance of ICT competencies, several factors hinder their acquisition among LIS students. Institutional challenges such as inadequate ICT infrastructure, insufficient funding, poor internet connectivity, outdated equipment, and limited technical support often restrict students' access to practical learning opportunities. The shortage of qualified instructors with advanced ICT expertise also affects effective teaching and skill development (Rubin, 2018).

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Technological challenges arise from the rapid pace of technological change. New technologies emerge continuously, making it difficult for students and institutions to keep pace with current developments. Some ICT tools are also complex and require specialized training before effective utilization.

Pedagogical challenges include inadequate practical training and limited opportunities for hands-on learning. In some institutions, ICT courses are taught primarily from a theoretical perspective, leaving students with insufficient practical experience (Lee, Kim and Lee, 2018). This limits their ability to apply acquired knowledge in real-world situations.

Personal factors such as lack of motivation, technophobia, computer anxiety, and inadequate prior exposure to technology can also hinder ICT skill acquisition. Students who lack confidence in using technology may experience difficulties in developing the required competencies (Hernandez, 2019). Furthermore, socio-economic challenges such as poverty and the digital divide often limit access to computers, internet services, and other technological resources necessary for skill development.

ICT has become a fundamental component of modern library and information services. The acquisition of ICT competencies is essential for LIS students to function effectively in contemporary information environments. Although various avenues exist for developing these competencies, several institutional, technological, pedagogical, personal, and socio-economic challenges continue to hinder their acquisition. Addressing these

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challenges is necessary to ensure that LIS graduates possess the technological skills required to meet the evolving demands of the information profession.

Methodology

This study adopted a survey research design. The study was carried out in Imo State University Owerri. The population of this study is 285. This comprises of one hundred and fifteen (115) 400 level students, forty five (45) 300 level students, sixty two (62) 200level students and sixty three (63) 100level students of library and information science in Imo State University, Owerri. The sample of the study is 100. The sample was randomly selected from the entire population. In this study, the researcher used rating scale as the instrument for data collection. The data collected for this study were analyzed using mean scores. Items with mean scores of 2.5 and above were seen as positive and below 2.5 were seen as negative.

Results and Discussion

Research Question 1: What are the ICT competencies of LIS students in Imo State University Owerri?

Table 1: ICT Competencies of LIS Students

(N=100)

S/N	Item Statement	Freq.	SA (4)	A (3)	D (2)	SD (1)	Total Score	Mean	Decision
1	Information technology (IT) skills	Freq.	50	22	20	8	314	3.1	Positive
		Score	200	66	40	8			
2	Database management skills	Freq.	12	80	2	6	298	2.98	Positive
		Score	48	240	4	6			
3	Web development skills	Freq.	20	50	25	5	285	2.9	Positive
		Score	80	150	50	5			

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4	Social media skills	Freq.	10	81	1	8	293	2.9	Positive
		Score	40	243	2	8			
5	Data analysis skills	Freq.	32	58	2	8	314	3.1	Positive
		Score	128	174	4	8			

The analysis of Table 1 revealed that information technology (IT) skills, database management skills, web development skills, social media skills, and data analysis skills are the ICT competencies of LIS students in Imo State University Owerri. This is evident in their response rates which are above the 2.5 averages.

This is in line with the findings of Tenopir (2015) who stated that data analysis skills are essential for LIS students to evaluate library services and inform decision-making. Also, Hernandez (2019) stated that social media skills are critical for LIS students to promote library services and engage with users. In the same vein, Buckland (2017) agreed that web development skills are essential for LIS students to provide online services and resources to users.

Research Question 2: What are the effectiveness of existing ICT-related courses in helping LIS students improve their ICT competencies in Imo State University?

Table 2: Effectiveness of Existing ICT-related Courses in Helping LIS Students Improve their ICT Competencies

(N=100)

S/N	Item Statement	Freq.	SA (4)	A (3)	D (2)	SD (1)	Total Score	Mean	Decision
1	Database management is effective	Freq.	50	22	20	8	314	3.1	Positive
		Score	200	66	40	8			
2	Web development is effective	Freq.	12	28	41	19	233	2.3	Negative
		Score	48	84	82	19			
3	Digital librarianship is effective	Freq.	20	50	25	5	285	2.9	Positive
		Score	80	150	50	5			

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4	Emerging technologies are effective	Freq.	10	8	81	1	227	2.3	
		Score	40	24	162	1			Negative

The analysis of Table 2 revealed that database management and digital librarianship, are effective in helping LIS students improve their ICT competencies in Imo State University. This is evident in their response rates which are above the 2.5 averages.

This is in agreement with the findings of Chowdhury and Chowdhury (2017) who stated that digital libraries are becoming increasingly important, as they provide users with access to a wide range of information resources. Also, Rubin (2018) agreed that database management is a critical skill for librarians and information professionals, as it enables them to manage and provide access to large amounts of information.

Research Question 3: What are the ways of acquiring ICT competencies by the students in Imo State University Owerri?

Table 3: Ways of Acquiring ICT Competencies by the Students

(N=100)

S/N	Item Statement	Freq.	SA (4)	A (3)	D (2)	SD (1)	Total Score	Mean	Decision
1	Formal education	Freq.	98	2	0	0	398	3.98	Positive
		Score	392	6	0	0			
2	Online courses	Freq.	55	23	20	2	330	3.3	Positive
		Score	220	69	40	2			
3	Workshops and training programs	Freq.	50	25	20	5	320	3.2	Positive
		Score	200	75	40	5			
4	Self-directed learning	Freq.	10	81	1	8	293	2.9	Positive
		Score	40	243	2	8			
5	Mentorship	Freq.	90	9	1	0	389	3.9	Positive
		Score	360	27	2	0			

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The analysis of Table 3 revealed that formal education, online courses, workshops and training programs, self-directed learning, and mentorship are the ways of acquiring ICT competencies by the students in Imo State University Owerri.

This is evident in their response rates which are above the 2.5 averages. This is in line with the findings of Tenopir (2015) who stated that many organizations, such as libraries, museums, and archives, offer mentorship programs that pair individuals with experienced professionals. Also, As noted by Hernandez (2019), self-directed learning is an effective way to acquire ICT competencies, as it provides individuals with the flexibility to learn whenever and wherever they want.

Research Question 4: What are the key challenges that hinder the acquisition of ICT skills among LIS students in Imo State University Owerri?

Table 4: Key Challenges that Hinder the Acquisition of ICT Skills among LIS Students (N=100)

S/N	Item Statement	Freq.	SA (4)	A (3)	D (2)	SD (1)	Total Score	Mean	Decision
1	Lack of infrastructure and resources	Freq.	98	2	0	0	398	3.98	Positive
		Score	392	6	0	0			
2	Lack of qualified instructors	Freq.	12	80	2	6	298	2.98	Positive
		Score	48	240	4	6			
3	Technological factors	Freq.	55	23	20	2	330	3.3	Positive
		Score	220	69	40	2			
4	Lack of hands-on experience and practical training	Freq.	20	50	25	5	285	2.9	Positive
		Score	80	150	50	5			
5	Lack of motivation and interest	Freq.	32	58	2	8	314	3.1	Positive
		Score	128	174	4	8			

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The analysis of Table 4 revealed that lack of infrastructure and resources, lack of qualified instructors, technological factors, lack of hands-on experience and practical training, and lack of motivation and interest are the key challenges that hinder the acquisition of ICT skills among LIS students in Imo State University Owerri.

This is evident in their response rates which are above the 2.5 averages. This is in line with the findings of Hernandez (2019) who stated that some students may not be motivated or interested in acquiring ICT skills, which can result in limited learning opportunities and inadequate preparation for the workforce. Also, Lee, Kim and Lee (2018) who stated that one of the major pedagogical factors that can hinder the acquisition of ICT skills among LIS students is the lack of hands-on experience and practical training. Moreover, Rubin (2018) noted that many institutions may not have instructors who are qualified to teach ICT skills, which can result in inadequate instruction and limited learning opportunities for students.

Recommendation

Based on the findings of this study, the following recommendations were made;

1. The university management should encourage the of LIS students to acquire more ICT skills so as to enable them become productive during practice.
2. Other ICT related courses should be encouraged so as to help LIS students improve their ICT competencies in Imo State University.
3. The university management should encourage the use of formal education, online courses, workshops and training programs, self-directed learning, and mentorship

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among others ways of acquiring ICT competencies by the students in Imo State University Owerri.

4. There should be adequate infrastructure and resources, qualified instructors, hands-on experience and practical training, and motivation and interest in order to encourage the acquisition of ICT skills among LIS students in Imo State University Owerri.

Conclusion

This research work is centered on ICT competencies of library and information science students of Imo State University Owerri. Information and Communication Technology has remained an indispensable aspect of librarianship. Its presence has made the profession easier for the professionals and as well facilitated access to the information needs of the users which is the main target of the library. For library professionals to be able to attend to the users well, there is need for them to acquire different ICT skills. These ICT skills cut across database management skills, web development skills, social media skills, and data analysis skills among others. It was noticed that exposing LIS students to these ICT skills through formal education, online courses, workshops and training programs, self-directed learning, and mentorship helps in improving their knowledge in services delivery and as well become better librarians in the future.

References

American Library Association. (2020). *Library and information science*. Chicago, IL: Author.

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Ally, M. (2019). Mobile learning: A framework for educational institutions. *Journal of Educational Multimedia and Hypermedia, 28*(1–2), 5–22.

Buckland, M. K. (2017). *Information and society*. Cambridge, MA: MIT Press.

Chowdhury, G. G., & Chowdhury, S. (2017). *Introduction to digital libraries* (3rd ed.). London, England: Facet Publishing.

Ezeani, C. N., & Ekere, J. N. (2009). ICT use by academic librarians in Nigeria: Implications for the library and information science curriculum. *Global Review of Library and Information Science, 5*, 39–50.

Hernandez, M. (2019). Diversity, equity, and inclusion in libraries. *Journal of Library Administration, 59*(2), 147–155.

International Telecommunication Union. (2012). *Measuring the information society 2012*. Geneva, Switzerland: Author. Retrieved from https://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2012/MIS2012_without_Annex_4.pdf

Kotler, P., Kumar, N., & Scheer, L. K. (2020). *Marketing management* (16th ed.). Harlow, England: Pearson Education.

Lee, J., Kim, J., & Lee, Y. (2018). Online learning platforms in library and information science education. *Journal of Education for Library and Information Science, 59*(3), 257–265.

McAlbert, F. U., & Uzoeto, N. A. (2016). Application of ICT to library and information services. In R. U. Onunogbo & P. C. Akanwa (Eds.), *Basic concepts of library practice* (pp. 178–215). Owerri, Nigeria: Supreme Publishers.

Mune, C., & Agee, A. (2021). Barriers to effective technology integration in higher education: A case study of faculty perspectives. *Journal of Information Technology Education: Research, 20*, 467–492.

Narasappa, K. C., & Kumar, P. D. (2016). ICT skills for LIS professionals in the digital environment. *International Journal of Research in Library Science, 2*(2), 55–58. Retrieved June 14, 2026, from *http://www.ijrls.in/wp-content/uploads/2016/08/ICT-Skillsfor-LIS-Professional-in-the-Digital-Environment.pdf*

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Nkhoma, M. Z., & Dang, D. P. (2020). Digital literacy in higher education: Enhancing university students' competence and confidence. *Journal of Applied Research in Higher Education, 12*(3), 516–534.

Osuagwu, H.U., Amadi, C. C. & Unamma, A. C. (2026). Impact of Information and Communication Technology (ICT) on the provision of information services to undergraduate students in Federal University of Technology, Owerri Library. International Journal of Applied Technologies in Library and Information Management. Volume 12, Number 2, pp. 129-140. Available on *https://www.ajol.info/index.php/jatlimi/article/view/334915*

Rubin, R. E. (2018). *Foundations of library and information science* (4th ed.). Chicago, IL: Neal- Schuman.

Tenopir, C. (2015). Data management and sharing in the scientific community. *Journal of the Association for Information Science and Technology, 66*(10), 2211–2222.

Toyese, O., Oyewumi, F. A., & Akanbi, M. L. (2018). Assessment of ICT competencies of library staff in selected universities in Kwara State, Nigeria. *Library Philosophy and Practice (e-journal)*, Article 1797. Retrieved from *https://digitalcommons.unl.edu/libphilprac/1797*

World Health Organization. (2019). *Digital health: A framework for action*. Geneva, Switzerland: Author.

Yusuf, H. O. (2013). Assessment of the availability, utilization and management of ICT facilities in teaching English language in secondary schools in Kaduna State, Nigeria. *Advances in Language and Literary Studies, 4*(1), 20–26. doi:10.7575/aiac.alls.v.4n.1p.20.

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