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Digital Literacy and Competencies in Library and Information Science Education Students in Nnamdi Azikiwe University Awka

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Abstract. This study delves into the digital literacy and competencies of Library and Information Science (LIS) students at Nnamdi Azikiwe University, Awka. Employing a quantitative approach with a descriptive survey design, data were gathered from 68 participants via a structured questionnaire on Google Survey. The questionnaire, using a 4-point Likert scale, covered demographic details, digital literacy levels, perceived curriculum effectiveness, impacts of pedagogical methods, identified barriers, and suggested improvement strategies. Analysis through descriptive statistics provided understandings into the digital proficiency of LIS students. The Kolmogorov-Smirnov and Shapiro-Wilk tests were used to assess normality. The Mann-Whitney U test examines differences between independent groups since the data violate normality assumptions and inform whether to accept or reject null hypotheses based on chosen significance levels. Results highlighted the expectations for LIS students to excel in digital libraries, archiving, system software, and communication. However, varying curriculum effectiveness was noted, influenced by accreditation standards and faculty expertise. Pedagogical methods such as hands-on learning and collaborative projects were found to enhance digital competencies, despite existing barriers like funding limitations and rigid curricula. The study advocates for curriculum enhancements, innovative pedagogy, and strategic interventions to bolster digital literacy in LIS programs.

Keywords:
Digital literacy;
Competencies;
Library;
Information science;
Students.

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INTRODUCTION

Digital literacy and competencies are essential skills for students in Library and Information Science (LIS) programs, particularly in today's technology-driven world. Digital literacy is the ability to effectively use and navigate digital technologies and information in various contexts (Bakare & Bakare, 2024). It

encompasses skills such as accessing, evaluating, and utilizing digital resources, as well as understanding digital tools and communication platforms. In today's digital age, digital literacy is crucial for success in education, work, and everyday life. It enables individuals to find, evaluate, create, and share information online responsibly and ethically (Ebiefung & Adetimirin, 2021). Developing digital literacy empowers individuals to adapt to technological advancements, critically assess digital content, protect their online privacy and security, and participate meaningfully in the digital world.

In the field of Library and Information Science (LIS), students are expected to possess a diverse set of digital skills to thrive in their profession. Digital skills encompass practical abilities and knowledge required to effectively navigate and utilize various digital technologies (Okeji et al., 2020). These skills are vital for tasks such as creating documents, conducting online research, communicating digitally, and adapting to technological advancements. In today's digital age, proficiency in using computers, software applications, the internet, and digital communication tools is essential for success in the LIS field (Atanda et al., 2021). Moreover, digital skills enable LIS professionals to efficiently manage and disseminate information in digital formats, contributing to the effective functioning of libraries and information centers.

According to Abdullah-Sani et al., (2024), LIS programs aim to equip students with these skills to effectively manage and disseminate information in digital formats. However, the level of digital literacy among LIS students can vary, influenced by factors such as prior experience, access to technology, and the curriculum's emphasis on digital skills. Studies by Sibiya (2023) and Raju (2020) highlight this variability, with some students showing strong digital competencies while others require additional training.

The effectiveness of the LIS curriculum in addressing digital literacy is a crucial consideration. Accreditation standards increasingly influence the integration of digital literacy components into curricula (Falloon, 2020). However, graduates often find gaps in their digital skills upon entering the workforce, indicating that the current curriculum may not fully meet industry needs (Rafi et al., 2019). Faculty expertise plays a significant role in the effectiveness of digital literacy education. Various pedagogical approaches can influence the development of digital competencies among LIS students. Hands-on learning experiences significantly boost digital skills by allowing students to actively engage with digital tools and resources (Guthrie, 2014). Collaborative projects, as highlighted by Ibrahim and Blunden (2014), foster teamwork and enhance digital communication skills, which are crucial for collaborative work in digital environments. Case studies provide students with opportunities to apply digital literacy skills in real-world contexts (Brown, 2019). Flipped classrooms, as discussed by Etemi et al., (2024), encourage self-directed learning of digital tools and resources, empowering students to explore at their own pace. Guest lectures from digital experts can also inspire innovation and facilitate knowledge exchange among students (Manukonda et al., 2019).

Despite efforts to integrate digital literacy into LIS education, several barriers exist. Insufficient funding limits access to up-to-date digital resources, hindering students' ability to learn and practice digital skills. The lack of faculty expertise in emerging digital tools can also hinder effective teaching of digital literacy (Ranieri et al., 2018). Inadequate student access to technology creates disparities in learning opportunities, as students with limited access may struggle to develop essential digital skills. Curriculum rigidity and overcrowded syllabi further limit the time available for teaching digital competencies, leading to a lack of depth in digital literacy education (Polly et al., 2021).

The need for the study stems from a crucial gap between the evolving demands of the information profession and the current educational curricula. With the rapid advancement of digital technologies, there is a pressing need for LIS professionals who are proficient in digital literacy to manage and disseminate information effectively (Mansour, 2017). Despite this, existing curricula often lag behind, inadequately preparing students for the digital challenges they will face in their careers. Recent studies indicate a disparity in digital literacy levels among LIS students, suggesting that many may not be fully equipped with the necessary digital competencies required in today's information-centric world (Yu, 2019;

Esh, 2022). This gap highlights the urgency of integrating comprehensive digital literacy training into LIS programs, ensuring students are well-prepared to meet the demands of the profession.

Furthermore, the rapid digital transformation in libraries and information centers calls for immediate action to reassess and revamp educational programs to include advanced digital skills and competencies. By addressing these gaps, the study aims to contribute valuable understandings that can inform curriculum development, pedagogical strategies, and ultimately enhance the digital literacy of future LIS professionals.

METHOD

The methodology of this study involved a quantitative approach following descriptive survey design. A total of 68 participants were included in the study. Data collection was conducted using a structured questionnaire distributed via a Google Survey. The questionnaire was based on 4-point Likert scale and included sections on demographic information, state of digital literacy and competencies, LIS curriculum, impact of different pedagogical approaches, the barriers to enhancing digital literacy and recommendations to improve digital literacy training in LIS programs. Descriptive statistics, including mean, standard deviation, variance, skewness, and kurtosis, offered understandings into the central tendency, variability, and distribution shape. The Kolmogorov-Smirnov and Shapiro-Wilk tests were used to assess normality. The Mann-Whitney U test examines differences between independent groups when data violate normality assumptions. It calculates a U statistic, indicative of rank differences between groups, and a Z value for significance. Results inform whether to accept or reject null hypotheses based on chosen significance levels. This statistical method was applied to test the study's hypotheses, specifically to explore significant differences in the level of digital literacy and competencies between male and female students. Throughout the research process, ethical considerations were strictly adhered to. Participants were informed about the study's purpose and assured of their anonymity and confidentiality.

RESULTS AND DISCUSSION

This section provides a comprehensive overview of the study population's demographic characteristics, including gender distribution and age range.

Demographics

Table 1. Gender profile and Age range of the respondents

Description	Category	Frequency	Percent	Valid Percent	Cumulative Percent
Age	19-22 years	24	35.3	35.3	35.3
	23-27 years	20	29.4	29.4	64.7
	28-32 years	24	35.3	35.3	100.0
Gender	Male	12	17.6	17.6	17.6
	Female	56	82.4	82.4	100.0
Total		68	100.0	100.0	

The table presents a snapshot of respondents' gender distribution and age ranges. It indicates that out of 68 respondents, 35.3% are aged 19-22 years, 29.4% are 23-27 years old, and another 35.3% fall in the 28-32 years range. In terms of gender, 17.6% are male, while a significant majority of 82.4% are female. This data suggests a higher representation of females across all age groups surveyed. Notably, the largest age group is 19-22 years, and females comprise the majority of respondents overall, comprising a substantial 82.4% of the total sample.

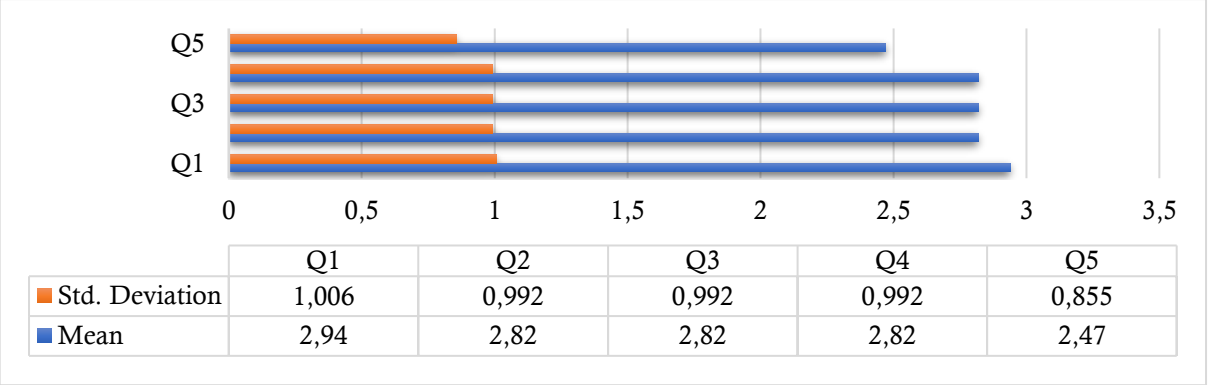
Descriptive statistics

Research Question one: What is the current state of digital literacy and competencies among LIS students?

Table 2. The current state of digital literacy and competencies among LIS students

	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Q1	1.011	.121	.291	-2.047	.574
Q2	.983	.367	.291	-1.923	.574
Q3	.983	.367	.291	-1.923	.574
Q4	.983	.367	.291	-1.923	.574
Q5	.730	1.276	.291	-.383	.574
Valid N (listwise)					

Q1: Ability to proficiently navigate and utilize various digital libraries.
Q2: Mastery of digital archiving and preservation techniques is expected.
Q3: Competence in using library management systems software is fundamental.
Q4: Effective digital communication skills for outreach and instruction are crucial.
Q5: Proficiency in data analysis and visualization tools is increasingly important.



	Q1	Q2	Q3	Q4	Q5
Std. Deviation	1,006	0,992	0,992	0,992	0,855
Mean	2,94	2,82	2,82	2,82	2,47

Figure 1. Mean and Standard deviation on the current state of digital literacy and competencies among LIS students

The mean scores and standard deviations in Table 2 and Figure 1 provide understandings into the current state of digital literacy and competencies among LIS students. The data suggests that for Q1, respondents were, on average, closer to "Agree" (mean = 2.94) with a moderate level of consensus (std. deviation = 1.006). Q2, Q3, and Q4 show identical average ratings (mean = 2.82) and consensus levels (std. deviation = .992), indicating similar levels of agreement just below Q1. Q5 has the lowest average agreement (mean = 2.47) with the tightest consensus among responses (std. deviation = .855), suggesting more uniformity in respondents' lower agreement or inclination towards "Disagree.".

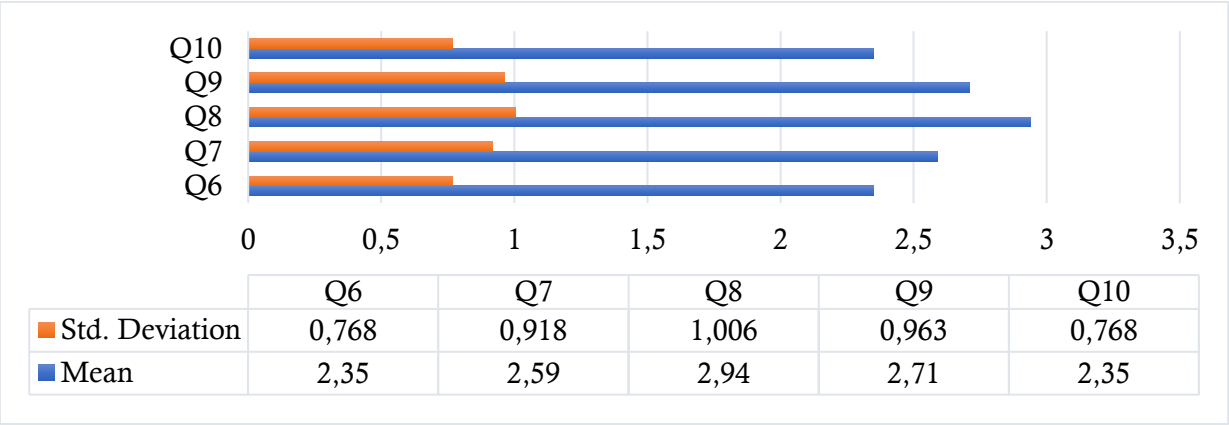
Research Question two: How effective is the current LIS curriculum in addressing digital literacy?

Table 3 and Figure 2 showed the effectiveness of the current LIS curriculum in addressing digital literacy. The data indicates varied levels of agreement across questions. Q6 and Q10 have the lowest mean scores (2.35), showing a tendency towards disagreement, with relatively low standard deviations (.768), suggesting a more consistent response among participants. Q7 and Q9 exhibit slightly higher agreement levels (mean of 2.59 and 2.71, respectively) but with greater variability in opinions (std. deviations of .918 and .963). Q8 has the highest mean score (2.94), closest to "Agree," yet with the highest variability (1.006), indicating the most diverse range of responses among these items.

Table 3. Effectiveness of the current LIS curriculum in addressing digital literacy

	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Q6	.590	1.736	.291	1.043	.574
Q7	.843	.924	.291	-1.181	.574
Q8	1.011	.121	.291	-2.047	.574
Q9	.927	.629	.291	-1.653	.574
Q10	.590	1.736	.291	1.043	.574
Valid N (listwise)					

Q6: Some curricula extensively cover digital tools, technologies, and ethics.
Q7: Accreditation standards increasingly influence digital literacy integration in curricula
Q8: Graduates often seek additional training for unaddressed digital skills gaps.
Q9: Faculty expertise significantly impacts the effectiveness of digital literacy education
Q10: Evolving curricula are slowly matching the rapid pace of digital innovation



	Q6	Q7	Q8	Q9	Q10
Std. Deviation	0,768	0,918	1,006	0,963	0,768
Mean	2,35	2,59	2,94	2,71	2,35

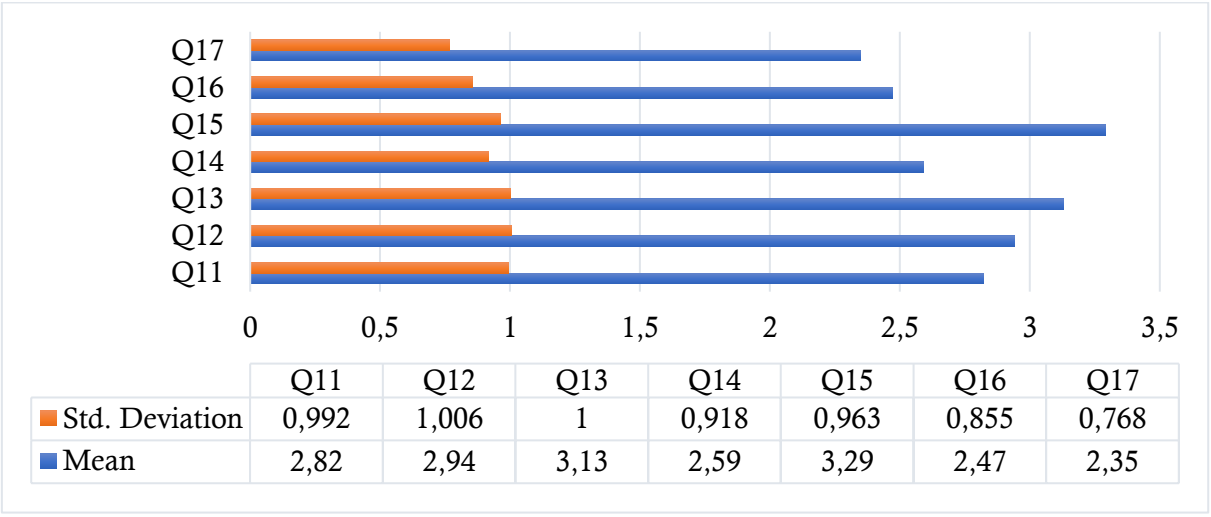
Figure 2. Mean and Standard deviation of effectiveness of the current LIS curriculum in addressing digital literacy

Research Question three: What impact do different pedagogical approaches have on developing digital competencies among LIS students?

Table 4. Impact of different pedagogical approaches have on developing digital competencies among LIS students

	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Q11	.983	.367	.291	-1.923	.574
Q12	1.011	.121	.291	-2.047	.574
Q13	1.000	-.258	.299	-1.997	.590
Q14	.843	.924	.291	-1.181	.574
Q15	.927	-.629	.291	-1.653	.574
Q16	.730	1.276	.291	-.383	.574
Q17	.590	1.736	.291	1.043	.574
Valid N (listwise)					

Q11: Hands-on learning significantly boosts digital competencies in LIS education.
Q12: Collaborative projects foster teamwork and enhance digital communication skills
Q13: Case studies help students apply digital literacy in real-world contexts.
Q14: Flipped classrooms encourage self-directed learning of digital tools and resources.
Q15: Guest lectures from digital experts inspire innovation and knowledge exchange.
Q16: Simulation exercises develop problem-solving skills in digital environments effectively.
Q17: Gamified learning increases engagement, motivating students to master digital competencies.



	Q11	Q12	Q13	Q14	Q15	Q16	Q17
Std. Deviation	0,992	1,006	1	0,918	0,963	0,855	0,768
Mean	2,82	2,94	3,13	2,59	3,29	2,47	2,35

Figure 3. Mean and standard deviation of the impact of different pedagogical approaches have on developing digital competencies among LIS students

Respondents Table 4 and Figure 3 show the impact of different pedagogical approaches have on developing digital competencies among LIS students. The data illustrates a range of attitudes among respondents. Q13 has the highest mean (3.13), indicating a tendency towards agreement, with moderate variability (std. deviation = 1.000). Q15 also shows a high mean (3.29) with slightly lower variability (std. deviation = .963), suggesting stronger agreement. Q12 follows closely with a mean of 2.94, indicating agreement, yet with higher variability (std. deviation = 1.006). Q11 and Q14 have similar means (2.82 and 2.59) but differing standard deviations (.992 and .918), suggesting mixed opinions. Q16 and Q17 have lower means (2.47 and 2.35) indicating disagreement, with Q17 showing the lowest variability (std. deviation = .768).

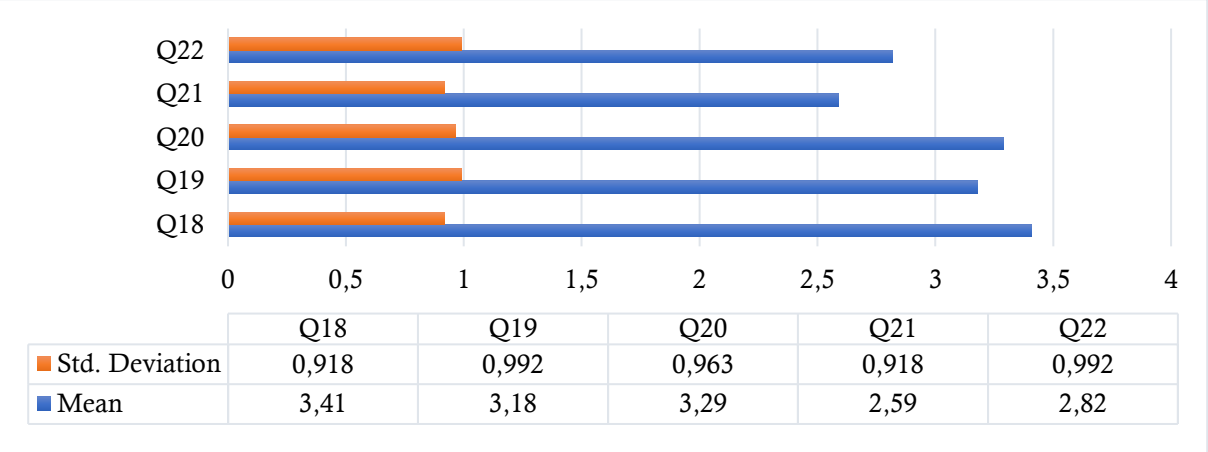
Research Question four: What are the barriers to enhancing digital literacy in LIS education?

Table 5. The barriers to enhancing digital literacy in LIS education

	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Q18	.843	-.924	.291	-1.181	.574
Q19	.983	-.367	.291	-1.923	.574
Q20	.927	-.629	.291	-1.653	.574
Q21	.843	.924	.291	-1.181	.574
Q22	.983	.367	.291	-1.923	.574
Valid N (listwise)					

Q18: Insufficient funding limits access to up-to-date digital resources.
Q19: Lack of faculty expertise in emerging digital tools hinders teaching.

Q20: Inadequate student access to technology creates unequal learning opportunities.
Q21: Curriculum rigidity leaves little room for integrating digital literacy components.
Q22: Overcrowded syllabi limit the time available for teaching digital competencies.



	Q18	Q19	Q20	Q21	Q22
Std. Deviation	0,918	0,992	0,963	0,918	0,992
Mean	3,41	3,18	3,29	2,59	2,82

Figure 4. Mean and Standard deviation of the barriers to enhancing digital literacy in LIS education

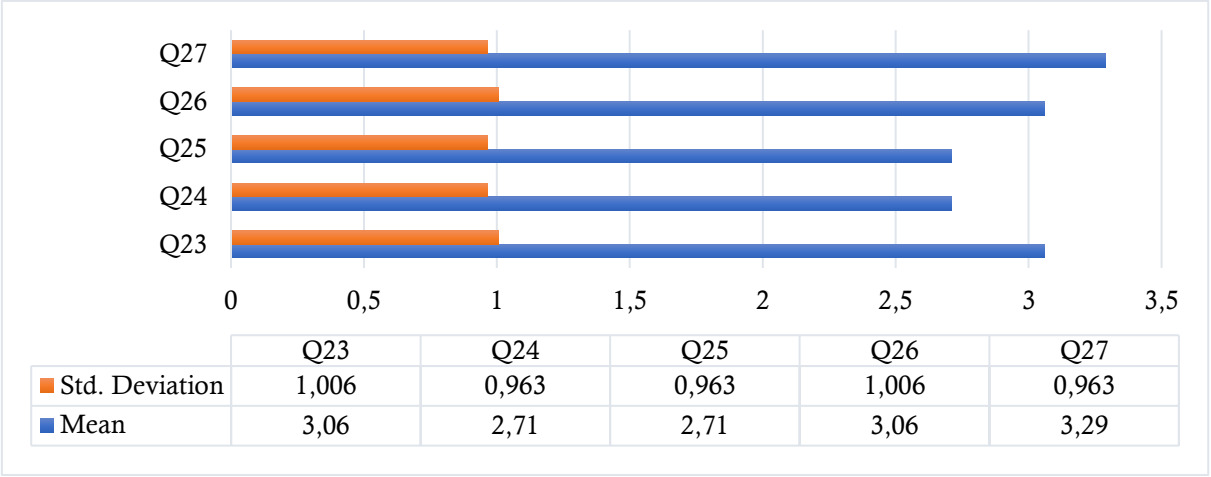
The responses in Table 5 and Figure 4 highlight the barriers to enhancing digital literacy in LIS education. Q18 has the highest mean (3.41), indicating strong agreement, with moderate variability (std. deviation = .918). Q20 also shows high agreement (mean = 3.29) with slightly lower variability (std. deviation = .963), suggesting a more consistent response. Q19 follows closely with a mean of 3.18, indicating agreement, yet with higher variability (std. deviation = .992). Q21 and Q22 have similar means (2.59 and 2.82) but differing standard deviations (.918 and .992), suggesting mixed opinions with Q21 leaning more towards disagreement.

Research Question five: What strategies can be recommended to improve digital literacy training in LIS programs?

Table 6. The strategies to improve digital literacy training in LIS programs

	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Q23	1.011	-.121	.291	-2.047	.574
Q24	.927	.629	.291	-1.653	.574
Q25	.927	.629	.291	-1.653	.574
Q26	1.011	-.121	.291	-2.047	.574
Q27	.927	-.629	.291	-1.653	.574
Valid N (listwise)					

Q23: Integrate digital literacy across all LIS courses for comprehensive learning.
Q24: Offer specialized workshops on data management and digital archiving.
Q25: Implement flipped classrooms to emphasize hands-on digital skill development.
Q26: Collaborate with IT departments for tech support and training partnerships.
Q27: Provide access to online resources for self-paced digital learning.



	Q23	Q24	Q25	Q26	Q27
Std. Deviation	1,006	0,963	0,963	1,006	0,963
Mean	3,06	2,71	2,71	3,06	3,29

Figure 5. Mean and Standard deviation of the strategies to improve digital literacy training in LIS programs

The responses in Table 6 and Figure 5 highlight the strategies to improve digital literacy training in LIS programs. The data indicates varying levels of agreement among respondents. Q27 has the highest mean (3.29), showing a tendency towards agreement, with moderate variability (std. deviation = .963). Q23 and Q26 also exhibit relatively high means (3.06), indicating agreement, yet with higher variability (std. deviations = 1.006). Q24 and Q25 have identical means (2.71), suggesting moderate agreement, with consistent responses (std. deviations = .963). Overall, the pattern suggests that Q27 has the strongest consensus, while Q24 and Q25 show moderate agreement, and Q23 and Q26 exhibit agreement with more diverse responses.

Table 7. Tests of Normality

Gender	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Male	.417	12	.000	.608	12	.000
Female	.202	56	.000	.889	56	.000

a. Lilliefors Significance Correction

Table 7 provided output presents the results of normality tests, specifically the Kolmogorov-Smirnov and Shapiro-Wilk tests, for two groups: Male and Female. For the Male group, both tests indicate significant departures from normality. The Kolmogorov-Smirnov test yielded a statistic of 0.417 with 12 degrees of freedom (df), and a significance value (Sig.) of 0.000. Similarly, the Shapiro-Wilk test resulted in a statistic of 0.608 with 12 df, and a significance value of 0.000. These p-values (0.000) are below the typical threshold of 0.05, suggesting strong evidence to reject the null hypothesis of normality. For the Female group, the tests also indicate non-normality. The Kolmogorov-Smirnov test produced a statistic of 0.202 with 56 df and a significance value of 0.000. Likewise, the Shapiro-Wilk test resulted in a statistic of 0.889 with 56 df and a significance value of 0.000. Again, these p-values (0.000) are below 0.05, indicating significant deviations from normality. Given the low significance values across both groups, it's reasonable to conclude that the data in both the Male and Female groups do not follow a normal distribution. This suggests the use of non-parametric methods for further analysis.

Hypotheses Testing

Hypothesis One: There is no significant difference in the level of digital literacy and competencies among male and female LIS students.

Table 8. Mann-Whitney U and Wilcoxon W tests on difference in the level of digital literacy and competencies among male and female LIS students.

Gender	N	Mean Rank	Sum of Ranks
Male	12	13.17	158.00
Female	56	39.07	2188.00
Total	68		

Mann-Whitney U=80.000, Wilcoxon W=158.000, Z =-4.208, Asymp. Sig. (2-tailed)=.000, Grouping Variable: Gender.

The Mann-Whitney U test results in table 8 indicate a significant difference in the level of digital literacy and competencies between male and female LIS students. The mean rank for males is 13.17, while for females it is 39.07. The Mann-Whitney U value is 80.000, and the Z value is -4.208, with an Asymp. Sig. (2-tailed) of .000. Since the p-value is less than the standard significance level of 0.05, we reject the null hypothesis. This suggests that there is a statistically significant difference in digital literacy and competencies between male and female LIS students.

Hypothesis two: There is no significant difference in the perceived effectiveness of the LIS curriculum in addressing digital literacy between male and female LIS students.

Table 9. Mann-Whitney U and Wilcoxon W tests on difference in the perceived effectiveness of the LIS curriculum in addressing digital literacy between male and female LIS students.

Gender	N	Mean Rank	Sum of Ranks
Male	12	26.50	318.00
Female	56	36.21	2028.00
Total	68		

Mann-Whitney U=240.000, Wilcoxon W=318.000, Z=-1.590, Asymp. Sig. (2-tailed)=.112, Grouping Variable=Gender

Table 9 presents the results of Mann-Whitney U and Wilcoxon W tests, assessing the perceived effectiveness of the LIS curriculum in addressing digital literacy among male and female students. The mean rank for males is 26.50, whereas for females it is 36.21. The Mann-Whitney U value is 240.000, with a Wilcoxon W value of 318.000. The Z value is -1.590, and the Asymp. Sig. (2-tailed) is .112, suggesting that the difference between genders is not statistically significant at the conventional significance level of 0.05. Therefore, the null hypothesis cannot be rejected, indicating no significant difference in perceived effectiveness between male and female LIS students.

Discussion

Research question one focused on the current state of digital literacy and competencies among LIS students. Result indicates that while many students demonstrate proficiency in navigating digital libraries, there are gaps in mastering digital archiving and preservation techniques. In contrast, a study by Amegashie and Ankamah (2020) found that students generally exhibit competence in using library management systems software, which is considered a foundational skill in modern library settings. Moreover, effective digital communication skills for outreach and instruction are deemed crucial. However, findings from a related study (Keboh & Baro, 2020; Abubakar, 2021) suggest that there is room for improvement in this area among Nigerian LIS students. The ability to communicate digitally is vital for engaging with patrons and providing efficient services. Overall, the current state of digital literacy among LIS students shows strengths in

some areas, such as navigating digital libraries and using management systems, but also highlights needs for further development in digital archiving, preservation, and communication skills.

Research question two covered how effective is the current LIS curriculum in addressing digital literacy. While accreditation standards are progressively mandating the integration of digital literacy into curricula, the extent to which these standards are met varies significantly. For instance, Ogunode and Adah (2022) emphasize that accreditation standards have indeed elevated the emphasis on digital literacy, yet implementation remains inconsistent across institutions. This finding aligns with research by Radovanović et al., (2015), who argue that despite the formal inclusion of digital literacy standards, many graduates find themselves seeking additional training to bridge the digital skills gap left by their education. In contrast, faculty expertise is recognized as a critical factor in the effective teaching of digital literacy. Zan et al., (2021) noted that faculty members with higher digital literacy competencies tend to impart more practical digital skills to their students, underscoring the impact of educators' proficiency. In a related study, Falloon (2020) concluded that where faculty expertise in digital tools and methodologies is high, students exhibit greater digital literacy competencies upon graduation.

Research question three examined the impact of different pedagogical approaches on developing digital competencies among LIS students. It was seen that different pedagogical approaches play a crucial role in shaping the development of digital competencies among LIS students. Hands-on learning, as emphasized by studies such as Zimmer and Matthews (2022), significantly enhances digital competencies by providing practical experience with digital tools and resources. In contrast, collaborative projects, as noted by Velaora et al., (2022), foster teamwork and improve digital communication skills, essential for effective collaboration in digital environments. Furthermore, case studies, according to Bravo et al., (2021), offer students opportunities to apply digital literacy in real-world contexts, thus deepening their understanding and skills. Flipped classrooms, as highlighted by Etemi et al., (2024), encourage self-directed learning of digital tools and resources, empowering students to explore at their own pace. Moreover, guest lectures from digital experts, as found in the study by Manukonda et al., (2019), inspire innovation and facilitate knowledge exchange, enriching students' understanding of digital practices.

Research question four was on the barriers to enhancing digital literacy in LIS education. The results showed that the enhancing digital literacy in LIS education faces several barriers, notable among them being insufficient funding, which significantly limits access to up-to-date digital resources. In contrast to the need for contemporary digital tools in education, Ying et al., (2019) highlight that the scarcity of funds hampers the acquisition of such resources, echoing the concerns of many in the field. Furthermore, the lack of faculty expertise in emerging digital tools, as discussed by Polly et al., (2021), directly hinders the ability to teach and model these competencies effectively. Inadequate student access to technology, as also identified by Kemp (2013), creates unequal learning opportunities, with some students being less prepared for the digital demands of the professional world. This issue aligns with findings from Mathias et al., (2023), who note that curriculum rigidity and overcrowded syllabi further exacerbate the challenge by leaving little room for integrating essential digital literacy components. Such curricular constraints limit not only the content that can be covered but also the depth of learning that is possible, suggesting a need for substantial curricular reform to address these barriers effectively.

Research question five was on the strategies to improve digital literacy training in LIS programs. The results showed that the improving digital literacy training in LIS programs can be achieved through several recommended strategies. First, integrating digital literacy across all LIS courses, as suggested by studies such as Rafi et al., (2019), ensures comprehensive learning and application of digital skills throughout the curriculum. This approach aligns with the findings of Falloon (2020), who emphasize the importance of embedding digital literacy components in all courses to foster a holistic understanding. Second, offering specialized workshops on data management and digital archiving, as highlighted by Purcell (2019), provides targeted training in crucial areas of

digital competency. Additionally, implementing flipped classrooms, emphasizes hands-on skill development by allowing students to engage with digital tools actively. Collaboration with IT departments for tech support and training partnerships, as noted by Hoanca, and Craig (2019), can further enhance digital literacy training by providing expert guidance and resources. Lastly, providing access to online resources for self-paced learning, as suggested by Ranieri et al., (2018), empowers students to continuously develop their digital skills beyond the classroom.

CONCLUSION AND SUGGESTION

The study on digital literacy and competencies among Library and Information Science (LIS) education students at Nnamdi Azikiwe University, Awka, offers significant understandings into the current state and challenges facing digital literacy integration within LIS curricula. The findings reveal a mixed landscape of opportunities and barriers that affect students' ability to develop the digital competencies necessary for their future professional roles. While the study highlights the enthusiasm and eagerness of students to embrace digital technologies, it also underscores the critical gaps in digital literacy training, including insufficient funding, lack of faculty expertise, inadequate access to technology, curriculum rigidity, and overcrowded syllabi. These barriers not only hinder the effective integration of digital literacy components but also limit students' potential to engage comprehensively with digital tools and resources.

However, the study also presents a roadmap for enhancing digital literacy training in LIS programs through strategic recommendations such as integrating digital literacy across all courses, offering specialized workshops, implementing flipped classroom models, collaborating with IT departments, and providing access to online resources for self-paced learning. These strategies are essential for preparing LIS students to navigate the digital landscape confidently and competently. In conclusion, the study calls for a concerted effort among educators, administrators, and policymakers to address the identified challenges and adopt the recommended strategies. Such efforts will ensure that LIS education at Nnamdi Azikiwe University, Awka, not only keeps pace with the evolving digital landscape but also equips students with the critical digital competencies needed to thrive in their future careers.

REFERENCES

Abdullah-Sani, M. K. J., Shari, S., Sahid, N. Z., Shaifuddin, N., Abdul Manaf, Z., & van Servellen, A. (2024). ASEAN Library and Information Science (LIS) research (2018–2022): a bibliometric analysis with strategies for enhanced global impact. *Scientometrics*, *129*(1), 95-125.

Abubakar, B. M. (2021). Library and information science (LIS) education in Nigeria: Emerging trends, challenges and expectations in the digital age. *Journal of Balkan Libraries Union*, *8*(1), 57-67.

Amegashie, P. K., & Ankamah, S. (2020). Information literacy among students of the university of Ghana business school and Ghana institute of management and public administration business school. *Library Philosophy and Practice*, 1-105.

Atanda, A. D., Owolabi, K. A., & Ugbala, C. P. (2021). Professional competence and attitudes of library personnel towards digital services in selected university libraries in Nigeria. *Digital Library Perspectives*, *37*(3), 209-222.

Bakare, O. D., & Bakare, B. M. (2024). Redesigning Library and Information Science Curriculum for Sustainable Environmental Transformation Among Students of the Department of Library and Information Science, Lead City University. *Journal of Education for Library and Information Science*, *65*(1), 1-21.

Blunden, A. (2014). *Collaborative projects: An interdisciplinary study* (Vol. 66). Brill.

Bravo, M. C. M., Chalezquer, C. S., & Serrano-Puche, J. (2021). Meta-framework of digital literacy: A comparative analysis of 21st-century skills frameworks. *Revista Latina de Comunicacion Social*, (79), 76-109.

Brown, J. P. (2019). Real-world task context: meanings and roles. *Lines of inquiry in mathematical modelling research in education*, 53-81.

Ebiefung, R., & Adetimirin, A. (2021). Cyber ethics adherence and the use of electronic information resources by undergraduates in public universities in Akwa Ibom state, Nigeria. *Digital Library Perspectives*, *37*(4), 349-365.

Esh, M. (2022). Analyzing digital literacy (DL) of the LIS students, University of North Bengal, India. *The Online Journal of Distance Education and e-Learning*, *10*(1).

Etemi, B. P., Uzunboylu, H., Latifi, S., & Abdigapbarova, U. (2024). The Effect of the Flipped Learning Approach on Engineering Students' Technology Acceptance and Self-Directed Learning Perception. *Sustainability*, *16*(2), 774.

Falloon, G. (2020). From digital literacy to digital competence: the teacher digital competency (TDC) framework. *Educational technology research and development*, *68*(5), 2449-2472.

Guthrie, C. (2014). The digital factory: A hands-on learning project in digital entrepreneurship. *Journal of Entrepreneurship Education*, *17*(1), 115.

Hoanca, B., & Craig, B. (2019). Building a K-16-industry partnership to train IT professionals. *Journal of Information Systems Education*, *30*(4), 232.

Holler, S., Brändle, M., & Zinn, B. (2023). How do South African TVET lecturers rate their digital competencies, and what is their need for training for a digital transformation in the South African TVET sector?. *Journal of Vocational, Adult and Continuing Education and Training*, *6*(1), 65-89.

Keboh, T., & Baro, E. E. (2020). Library and Information Science (LIS) students competency in evaluating information and information resources in universities in Nigeria. *UNIZIK Journal of Research in Library and Information Science*, *5*(1), 17-41.

Kemp, L. J. (2013). Students' inadequate exposure to learning technology: overcoming the pedagogical challenge using wikis. In *The Plugged-In Professor* (pp. 25-34). Chandos Publishing.

Mansour, E. (2017). A survey of digital information literacy (DIL) among academic library and information professionals. *Digital Library Perspectives*, *33*(2), 166-188.

Manukonda, S. R., Priyadarshini, C., Ponnam, A., & Sode, R. (2019). What motivates students to attend guest lectures?: A comparative study across three popular disciplines in India. *The International Journal of Learning in Higher Education*, *26*(1), 23.

Mathias, L., Mwamakula, F., & Mhagama, M. (2023). Challenges facing Public Secondary School Teachers on Implementing Competence-Based Curriculum in Magu District, Mwanza-Tanzania. *development*, *18*, 13.

Ogunode, N. J., & Adah, S. (2022). Accreditation of academic programs in public universities in Nigeria: Challenges and way forward. *Electronic Research Journal of Social Sciences and Humanities*, *4*(2), 15-27.

Okeji, C. C., Ilika, O. M., & Baro, E. E. (2020). Assessment of information literacy skills: A survey of final year undergraduates of library and information science in Nigerian universities. *Global Knowledge, Memory and Communication*, *69*(6/7), 521-535.

Polly, D., Martin, F., & Guilbaud, T. C. (2021). Examining barriers and desired supports to increase faculty members' use of digital technologies: Perspectives of faculty, staff and administrators. *Journal of Computing in Higher Education*, *33*, 135-156.

Purcell, A. D. (Ed.). (2019). *The digital archives handbook: a guide to creation, management, and preservation*. Rowman & Littlefield.

Radovanović, D., Hogan, B., & Lalić, D. (2015). Overcoming digital divides in higher education: Digital literacy beyond Facebook. *New media & society*, *17*(10), 1733-1749.

Rafi, M., JianMing, Z., & Ahmad, K. (2019). Technology integration for students' information and digital literacy education in academic libraries. *Information Discovery and Delivery*, *47*(4), 203-217.

Raju, J. (2020). Future LIS education and evolving global competency requirements for the digital information environment: An epistemological overview. *Journal of Education for Library and Information Science*, *61*(3), 342-356.

Ranieri, M., Raffaghelli, J., & Pezzati, F. (2018). Digital resources for faculty development in e-learning: a self-paced approach for professional learning. *Italian Journal of Educational Technology*, *26*(1), 104-118.

Sibiya, P. T. (2023). Knowledge, Skills and Competencies of the Library Information Science School's Graduates on Digital Scholarship in South Africa. *Internet Reference Services Quarterly*, *27*(2), 83-101.

Velaora, C., Dimos, I., Tsagiopoulou, S., & Kakarountas, A. (2022). A game-based learning approach in digital design course to enhance students' competency. *Information*, *13*(4), 177.

Ying, Q., Hassan, H., & Ahmad, H. (2019). The role of a manager's intangible capabilities in resource acquisition and sustainable competitive performance. *Sustainability*, *11*(2), 527.

Yu, L. (2019). Towards structure–agency integrative theories for information access disparity: Lessons from within and beyond LIS. *Journal of documentation*, *75*(3), 458-477.

Zan, B., Çolaklar, H., Altay, A., & Taşkın, N. (2021). A study on digital literacy skills of faculty of letters students: Use of university library. *International Journal of Emerging Technologies in Learning (iJET)*, *16*(1), 152-171.

Zimmer, W. K., & Matthews, S. D. (2022). A virtual coaching model of professional development to increase teachers' digital learning competencies. *Teaching and Teacher Education*, *109*, 103544.