Cognitive Factors and Digital Information Evaluation Competency among LIS Undergraduates: Evidence from the University of Maiduguri, Nigeria

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Abstract

This study examined the cognitive factors influencing digital information evaluation competency among undergraduate students of Library and Information Science (LIS) at the University of Maiduguri, Borno State, Nigeria. The research employed a descriptive survey design with a population of 1,080 undergraduate LIS students. Through multistage sampling, 285 students were selected across all academic levels. Data were collected using a validated questionnaire with a reliability coefficient of 0.87. The results revealed that the majority of respondents (58.2%) demonstrated moderate digital information evaluation competency ($\bar{X}$= 3.32, SD = 0.68). Critical thinking skills showed a significant positive correlation with competency ($r = 0.64$, $p < 0.01$), as did cognitive load management ($r = 0.52$, $p < 0.01$) and metacognitive awareness ($r = 0.69$, $p < 0.01$). Multiple regression analysis indicated that these three cognitive factors collectively explained 56% of the variance in digital information evaluation competency ($R^2 = 0.56$, $F(3, 269) = 59.87$, $p < 0.001$). The study concludes that metacognitive awareness appears to be the strongest predictor of competency. These findings may have implications for curriculum design in LIS education and highlight the potential importance of integrating cognitive skills training into information literacy instruction. It is recommended that LIS Department should integrate metacognitive instruction across LIS curricula, model expert thinking processes, and invest in faculty development for effective information literacy pedagogy.

Keywords: **Cognitive Factors, Digital Information Evaluation Competencies, LIS Undergraduate, University of Maiduguri, Nigeria**

Introduction

The rapid growth of online information resources has significantly transformed higher education and altered students' information-seeking behaviours. Zhao et al., (2021) believe that undergraduate students now have access to a wide range of repositories, including academic databases, social media platforms, online journals, and open-access repositories. While the abundant information offers numerous benefits, according to Ndibalema, (2025), it also presents challenges related to evaluation, verification, and effective utilization of information. Consequently, developing the ability to critically appraise digital information has become essential for academic success and lifelong learning.

The Association of College and Research Libraries (ACRL) Framework of Information Literacy about Higher Education anticipates behavioural, affective, cognitive, and metacognitive interactions with information ecosystems and acknowledges the fact that information literacy is not an outcome of technical literacy but rather a higher-order thinking process (ACRL, 2015). On this basis, the Library and Information Science (LIS) education programmes are currently faced with the challenge of equipping students to operate in multifaceted digital information space (Sanchez-Caballe et al., 2020).

In a study conducted by Pinto et al., (2020) it is declared that undergraduate LIS students are expected to develop strong cognitive abilities that enable them to effectively assess digital information sources in an optimal educational setting. These students typically should demonstrate high critical thinking skills, which would allow them to analyse information objectively, identify biases, and evaluate source credibility (Pagan-Castano et al., 2023). When handling complex information, student should be adept at managing cognitive load, which helps prevent overload and keeps their focus on relevant evaluation criteria. Additionally, these students need to exhibit a high level of metacognitive awareness, that enable them to monitor their evaluation processes, recognize gaps in their knowledge, and adapt their approaches accordingly. Gross et al., (2022) identified that such cognitive skills are actively cultivated

through systematic teaching, practical tasks, and consistent feedback within the LIS curriculum.

Over the years, such impressions are confirmed nearly impossible to achieve under certain educational environment. It is even observed that it is likely to be an utopia adventure whereby it might not be very true to the present conditions at the University of Maiduguri and similar institutions in the northeast of Nigeria. Apparently, there are several reasons that seem to cause possible deficiencies in the digital information evaluation competency of students. Ndibalema, (2025), argued that the emergence of digital sources of information has far exceeded the preparation of proper cognitive-skills in various LIS programmes. Zhao et al., (2021) earlier asserted that the historic library-science education and training tradition, which traditionally focused on the physical collection management and cataloguing, has not necessarily developed to meet the cognitive needs of the digital information assessment. Looking at the issues from a different perspective, Virkus and Garoufallou (2020) and Tachie-Donkor and Ezema, (2023) had even discovered that the availability of technological infrastructure and good internet connectivity in the area could have limited the chances of the students to gain practical digital evaluation skills . Friday et al., (2024) further explained that security issues in the Borno State have continued to interfere with the educational processes, and the students may have limited access to the variety of information sources and practices in evaluation. Ndibalema, 2025) deviated from the conclusion raised by Friday et al. (2024) and presupposes that the existing body of empirical studies does not seem to include specific studies that investigate the cognitive variables that regulate the digital information evaluation of Nigerian LIS students, which could lead to the development of the curriculum, potentially being not informed by evidence in the most effective way.

The impact of poor digital information evaluation competency has really been a major concern among scholars. Studies have always indicated concerns that the undergraduate LIS learners are the first to be hit as they might be unable to accomplish academic tasks successfully, differentiate between reliable sources and false information, and acquire the abilities that could be needed to work in the professional environment. Sanchez-Caballe et al., (2020) disclosed

that information literacy teaching pedagogy is also a problem that faculty members face because students do not have underlying cognitive foundations on which they can be evaluated. Asubiaro and Badmus, (2020) reiterated that without the critical competencies, the LIS programme in the University of Maiduguri can suffer a loss in the quality of the educational process and the results of student graduation. In a broader sense, Sinha & Bokwe, (2024) reflected that it can affect the library and information profession of Nigeria by relying in graduates who are poorly equipped with the cognitive skills required in the modern information work. This means that the future information professionals might not deliver the optimal library services to the communities as digital resources cannot be properly assessed and filtered by the professionals (Liu, 2023; Odularu & Bokwe, 2025).

Various interventions have been tried or suggested to deal with information-literacy issues at higher-educational levels. In other institutions, the information-literacy education has been integrated into core curriculum courses, which have ensured an orderly contact with the evaluation skills (Gross et al., 2022). There are modules on critical thinking and evaluation of sources developed by others (Withorn et al., 2021; Ndibalema, 2025). The ACRL Framework has given recommendations on the way instructions should be designed to meet the cognitive, affective and behavioural aspects of information literacy. Even though some universities in Nigeria have also made information-literacy classes compulsory to all undergraduate students (Udem & Anaehobi, 2020; Kong et al, 2025), it would be better to build such programme on a framework to create uniformity and consistency among learning institutions. Nonetheless, the interventions put int place by the universities were not equally effective, and there is scanty evidence on what cognitive factors have the strongest impact on evaluation competency.

As much as the information literacy has been widely appreciated regarding the role of cognitive factors in the process, there are several gaps that remain at the current body of knowledge. For example, despite the studies of the cognitive dimensions of information literacy in around the globe, empirical evidence is still scarce when Nigerian is placed under perspective. Another surprising fact is that, the vast majority of the existing researches have provided findings n the general information literacy, or better still on the digital literacy as general construct, and

limited focus has been recorded on the specific cognitive processes which can mediate digital information evaluation (Zhao et al., 2021; Jamali and Nabavi, 2021; Ndibalema, 2025). The dearth of empirical evidences, which demonstrates knowledge gap on the interaction among various cognitive variables (critical thinking, cognitive load management, metacognitive awareness) and the degree to which they play a relative role in competency contributed to the emergence of this study.

Objectives of the Study

The main objective of this study is to examine:

1. level of digital information evaluation competency among undergraduate LIS students at the University of Maiduguri.
2. relationship between critical thinking skills and digital information evaluation competency among undergraduate LIS students at the University of Maiduguri.
3. relationship between cognitive load management and digital information evaluation competency among undergraduate LIS students at the University of Maiduguri.
4. relationship between metacognitive awareness and digital information evaluation competency among undergraduate LIS students at the University of Maiduguri.
5. combined influence of critical thinking, cognitive load management, and metacognitive awareness on digital information evaluation competency among undergraduate LIS students at the University of Maiduguri.

Literature Review

Empirical studies on digital information evaluation reveal that student competencies vary depending on several factors For example, Haq et al., (2021) studied engineering students at the higher education and level found a significant lack of digital information evaluation skills(, leading to the proposal of improved training programmes. Zhao et al. (2021) conducted a systematic literature review across the Web of Science and Scopus databases, finding that most

university students and teachers possess basic digital competence rather than advanced levels. Alex-Nmecha and Ejitagha (2023) assessed the digital information literacy of LIS undergraduates in Nigerian universities, noting a high degree of skill variance influenced by prior training and available technology. Sanchez-Caballe et al. (2020) also conducted a systematic review of digital competence in university students, searching Scopus, Web of Science and ERIC databases, and identifying a gap in the assessment methods used.

Numerous studies have, by extension, investigated the link between critical thinking and information literacy. A bibliometric analysis by Pagan-Castano, et al. (2023) revealed that critical thinking is increasingly recognised as a key competence for higher education students and research is growing into developing and evaluating it. Pinto et al. (2020) reviewed trends in information literacy within higher education from 2006 to 2019, emphasising the importance of critically analysing and evaluating information. Haq et al. (2021) surveyed scholarly literature on information literacy in the Web of Science and found critical thinking was a prominent theme. Scholarship in this area also investigates how librarians and instructors conceptualise and implement critical thinking within information literacy instruction (Gross et al., 2022).

Cognitive load studies in information contexts have yielded significant findings. Jain et al. (2025) conducted a longitudinal study on psychology students' information-seeking knowledge. They found that working memory capacity mediates the growth of these skills and that cognitive load theory can be applied to model database and tutorial usability. Sigolo and Casarin (2024) conducted a literature review analysing sources on the role of cognitive load theory in understanding information overload. Their conclusion was that combining CLT with information overload can improve our understanding of cognitive issues. Niwanputri et al. (2025) explored how user expertise and search strategies interact with cognitive load when searching for academic information. The influence of cognitive load on information seeking behaviour in various situations, including virtual communities and health information, has also been studied (Zhu et al., 2023; Na and Jeong, 2020).

Metacognition has become a key component of information literacy research. Earlier studies on epistemic metacognition during web-based information searching showed that knowing your own knowledge significantly influences how people evaluate sources. Subsequent research distinguished between metacognitive knowledge – understanding which strategies work – and metacognitive regulation – actively monitoring and adjusting those strategies in practice. For example, students who received metacognitive scaffolding during their information-search tasks performed better (Huertas et al., 2018). A topic-modelling and bibliometric analysis of metacognition literature in education by Chen et al. (2025) identified several important themes and trends including the increasing importance of metacognitive awareness in digital learning environments. Research in related areas like reading comprehension and collaborative learning has consistently demonstrated the value of metacognitive practices for academic success.

There has also been a rise in empirical studies on information literacy self-efficacy. For example, Tang and Tseng's (2022) research explored the self-efficacy and information literacy skills of distance learners, revealing a strong correlation between self-efficacy and various information literacy abilities. The Information Literacy Self-Efficacy Scale (ILSES), developed by Pagán Castaño et al. (2023), has gained widespread use and undergone testing and validation across different settings. Sanchez-Caballe et al. (2020) provided methodological guidance on assessing the reliability and validity of self-efficacy scales in evaluating information literacy skills among students. Liu (2023) examined the motivation behind information literacy, self-efficacy and course attitudes, particularly considering credit, and found that graduate students demonstrated high self-efficacy. Furthermore, information literacy self-efficacy studies have been conducted in Nigeria and have even involved comparative analyses of postgraduate students from various institutions (Onyencha, 2020; Udem & Anaehobi, 2020).

Ndibalema (2025) highlights persistent digital literacy gaps in universities, emphasising the urgency of cultivating robust digital competencies to meet the demands of contemporary academic and professional environments. This is complemented by Sinha and Bokwe (2024),

who identify Nigeria and South Africa as pivotal hubs for digital literacy activity while acknowledging the stark disparities that exist in literacy levels across different countries. Their findings suggest that regional contexts significantly influence the adoption and mastery of digital skills.

Information literacy, a closely related construct, has been shown to strongly impact students' academic success and information practices. Tachie-Donkor and Ezema (2023) demonstrate that university students with advanced information literacy skills exhibit more effective information-seeking behaviour and are better positioned for lifelong learning. In the Nigerian context, Alex-Nmecha and Ejitagha (2032) as well as Zimmerman and Ni (2021) delineate both the obstacles and prospects in implementing information literacy instruction. These challenges range from infrastructural inadequacies and limited faculty expertise to the lack of comprehensive institutional policies supporting literacy integration.

Curriculum development and technological integration have also received attention information literacy and critical thinking. Asubiaro and Badmus (2020) and Jain, Adeyemi, and Oladipo (2024) stress that Nigerian Library and Information Science (LIS) education requires stronger alignment with digital competencies and the inclusion of emerging technologies to enhance student readiness. They advocate for a redesign of the LIS curriculum to bridge theoretical knowledge with practical digital skill acquisition.

Synthesising these findings reveals a clear pattern: while African universities, especially in Nigeria, recognise the importance of digital and information literacy, systemic gaps persist in curriculum design, technology infrastructure, and policy implementation. Scholars collectively argue for multi-level interventions, including faculty training, policy reforms, and resource allocation, to advance literacy outcomes. The reviewed literature thus positions digital and information literacy not merely as academic competencies but as foundational skills critical to

the broader educational and socio-economic growth of the continent (Ndibalema, 2025; Sinha & Bokwe, 2024; Tachie-Donkor & Ezema, 2023; Alex-Nmecha & Ejitagha, 2032; Zimmerman & Ni, 2021; Asubiaro & Badmus, 2020; Jain et al., 2024).

Methodology

This paper employed a descriptive survey research design to explore the cognitive factors influencing digital information evaluation competency among undergraduate Library and Information Science students. A descriptive survey was chosen for its ability to collect data from a large population, enabling researchers to assess the status of variables and their interconnections without manipulation (Creswell & Creswell, 2018). This approach facilitated the gathering of quantitative data on students' cognitive variables and evaluation competency using standardised measuring tools, allowing for statistical analysis of associations and prediction patterns. The target population comprised all undergraduate students studying Library and Information Science at the University of Maiduguri in the 2024/2025 academic year. Department records indicated a total of 1,080 students across four study levels (100-level to 400-level). This group was deemed suitable as LIS students are the future information professionals who will require strong digital information evaluation skills in their careers.

The sample size for this study was determined using Krejcie and Morgan's (1970) table for calculating sample size based on a given population. The recommended sample size was 285 for a population of 1,080. Multistage sampling, incorporating both probability and proportionate sampling strategies, was employed to achieve representativeness. The entire population was initially stratified into four levels based on academic levels: 100, 200, 300 and 400. This stratification reflected students' varying levels within their academic programmes, as cognitive development and assessment competency differ across years of study. The sample size of 285 was proportionally allocated to each level based on the population size. At each academic level, the sample size of students required was randomly selected using simple random sampling. A random number generator was employed to ensure every learner within a level had an equal chance of selection, thereby reducing selection bias.

Level	Population	Proportionate sample Size
Level one	232	61
Level two	224	59
Level three	251	66
Level four	373	98
Total	1080	285

The structured questionnaire was used to gather data with the help of the digital information evaluation competency questionnaire called Cognitive Factors and Digital Information Evaluation Questionnaire (CFDEQ). The researchers created the questionnaire through the long literature review and available validated instruments in cognitive psychology and information literacy research. The tool was divided into five parts namely demographic data, critical thinking ability, cognitive load management, metacognitive awareness, and digital information evaluation ability.

Content and construct validation was conducted on the instrument. Expert review was done by three faculty members of the department of library and information science and two of the department of educational psychology of the University of Maiduguri to determine the content validity. The professionals evaluated relevance, clarity, and understanding of items and recommended changes that were included in the final tool. A pilot test was carried out using 40 LIS students of Bayero University Kano, Kano State that were not included in the actual sample of the study. Cronbach alpha coefficient was applied to the pilot data to find out the internal consistency reliability. The resultant reliability coefficients were Critical Thinking Skills Scale (a = 0.84), Cognitive Load Management Scale (a = 0.81), Metacognitive Awareness Scale (a = 0.86) and Digital Information Evaluation Competency Scale (a = 0.88). The instrument reliability was generally 0.87 which was above the minimum acceptable instrument reliability of 0.70 by Nunnally (1978) and this implied that the instrument had good internal consistency. The information was collected in a number of steps within a four-week phase during October-November 2025. The questionnaires that were sent out were 285, out of which 277 were returned, which is a response rate of 97.1. Following the completeness and validity screening, 273 questionnaires (95.8%), were considered to be suitable to analyze. There were 10 questionnaires that were filtered out because of either incomplete questions or a pattern of non-serious response. It is worth clarifying that the achieved sample per academic

level (100-level = 61, 200-level = 59, 300-level = 66, 400-level = 98) reflects minor attrition that occurred at the data-collection stage — principally questionnaires that were not returned or were excluded during screening — rather than any deviation from the original proportionate allocation of the students per level.

The Statistical Package of Social Sciences (SPSS) version 27.0 was used to analyze the data through descriptive and inferential statistics. The process of the analysis was the following: data were cleaned, coded, and filtered. Missing values were investigated and no tendencies of systematic missingness were identified. Parametric tests (normality, linearity, homoscedasticity) assumptions were tested with the help of relevant diagnostic procedures. Demographics variables were calculated in numbers and percentages. On the scale scores, the means, the standard deviations and weighted mean scores were calculated. The interpretation of weighted mean scores was done using the following categories: 1.00-1.80 (Very Low), 1.81-2.60 (Low), 2.61-3.40 (Moderate), 3.41-4.20 (High), and 4.21-5.00 (Very High). The correlation coefficients, which were taken to test the presence of relationships between each of the cognitive factors (critical thinking, cognitive load management, metacognitive awareness) and digital information evaluation competency, were computed through Pearson product-moment correlation coefficients. The level of statistical significance was $p < 0.05$. To determine the overall effect of the three factors on digital information evaluation competency, multiple linear regression was used to analyze the interactive effect of the three cognitive factors. This analysis established the percentage of variance of competency which the cognitive factors (in combination with one another) and individually explain.

Ethical Considerations

Ethical approval for this study was obtained from the Research Ethics Committee of the Faculty of Education, University of Maiduguri, before data collection commenced. Participation was entirely voluntary and all respondents provided informed consent prior to completing the questionnaire. Participants were guaranteed anonymity and confidentiality; no personally

identifiable information was collected or stored. The study posed no foreseeable physical or psychological risk to participants, who were free to withdraw at any stage without consequence.

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Results

Table 1 presents the demographic characteristics of the 273 respondents who participated in the study.

Table 1: Demographic Characteristics of Respondents (N = 273)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	112	41.0
	Female	161	59.0
		273	100
Age Group	18-20 years	89	32.6
	21-23 years	126	46.2
	24-26 years	47	17.2
	27 years and above	11	4.0
		273	100
Academic Level	100-Level	69	25.3
	200-Level	68	24.9
	300-Level	69	25.3
	400-Level	67	24.5
		273	100
Prior IL Training	Yes	187	68.5
	No	86	31.5
		273	100

Results Table 1 shows that the majority of the respondents were female students who constitute 59.0 -percent (n=161) as compared to 41.0 -percent (n=112) male students. The age results illustrated that the most significant group of respondents belonged to the 21- 23- year-range, with 46.2 per cent (n=126), and then the 18-20 years old (32.6 per cent, n=89). Representation at academic level was also homogeneous and in the range of 24.5 to 25.3 that is consistent with the stratified sampling design used. Besides, 68.5 per cent (n=187) respondents said that they

have received information-literacy training previously and 31.5 per cent (n=86) said they have not received any such training.

Table 2 presents the descriptive statistics for digital information evaluation competency among the respondents.

S/No	Items	$\bar{x}$	SD
1.	Ability to assess the credibility of online information sources	**3.56**	**0.59**
2.	Skills to verify the accuracy and authenticity of digital information	**3.48**	**0.63**
3.	Ability to identify misinformation, disinformation, and fake news	**3.19**	**0.75**
4.	Technical know-how to evaluate the relevance and quality of digital information for academic and professional purposes	**3.11**	**0.72**
5.	Knowledge to compare information from multiple digital sources before making decisions	**3.26**	**0.71**
	Grand/Weighted Mean	**3.32**	**0.68**

The findings in Table 2 indicate that respondents demonstrated a moderate level of digital information evaluation competency, with an overall weighted mean of 3.32 (SD = 0.68). The highest-rated element was the ability to assess the credibility of online information sources ($\bar{X}$= 3.56, SD = 0.59), followed by the ability to verify the accuracy and authenticity of digital information ($\bar{X}$= 3.48, SD = 0.63), both reflecting high competency. Moderate competency was observed in comparing information from multiple digital sources ($\bar{X}$= 3.26, SD = 0.71), identifying misinformation and disinformation ($\bar{X}$= 3.19, SD = 0.75), and evaluating the relevance and quality of digital information ($\bar{X}$= 3.11, SD = 0.72). Overall, the findings suggest that while respondents possess satisfactory digital information evaluation skills, further improvement is needed in advanced information evaluation competencies.

Table 3 presents the correlation analysis examining the relationship between critical thinking skills and digital information evaluation competency.

Variable	$\bar{x}$	SD	Correlation (r)	Sig. (2-tailed)
Critical Thinking Skills	3.28	0.74	0.64**	< 0.001
Digital Information Evaluation Competency	3.32	0.68		

**Correlation is significant at the 0.05 level (2-tailed)

The Pearson correlation analysis reveals a significant positive relationship between critical thinking skills and digital information evaluation competency ($r = 0.64$, $p < 0.001$). This strong positive correlation suggests that students with higher critical thinking abilities tend to demonstrate greater competency in evaluating digital information. The mean score for critical thinking skills (xbar = 3.28, SD = 0.74) falls within the moderate range, slightly below the evaluation competency mean. This relationship appears consistent with theoretical expectations that critical thinking underlies effective information evaluation.

Table 4 presents the correlation analysis examining the influence of cognitive load management on digital information evaluation competency.

Variable	$\bar{x}$	SD	Correlation (r)	Sig. (2-tailed)
Cognitive Load Management	3.19	0.79	0.52**	< 0.001
Digital Information Evaluation Competency	3.32	0.68		

**Correlation is significant at the 0.05 level (2-tailed)

The analysis demonstrates a significant positive relationship between cognitive load management and digital information evaluation competency ($r = 0.52$, $p < 0.001$). This moderate to strong positive correlation indicates that students who can effectively manage cognitive load during information processing tend to exhibit higher evaluation competency. The mean score for cognitive load management ($\bar{X}$= 3.19, SD = 0.79) represents the lowest among the three cognitive factors examined, suggesting that students may experience more difficulty in managing cognitive demands during complex information evaluation tasks. This finding aligns with Cognitive Load Theory's predictions regarding the importance of cognitive resource management.

Table 5 presents the correlation analysis examining the effect of metacognitive awareness on digital information evaluation competency.

Variable	$\bar{x}$	SD	Correlation (r)	Sig. (2-tailed)
Metacognitive Awareness	3.41	0.71	0.69**	< 0.001
Digital Information Evaluation Competency	3.32	0.68		

**Correlation is significant at the 0.05 level (2-tailed)

The results reveal a significant positive relationship between metacognitive awareness and digital information evaluation competency ($r = 0.69$, $p < 0.001$). This strong positive correlation indicates that students with higher metacognitive awareness demonstrate substantially greater competency in evaluating digital information. Notably, the mean score for metacognitive awareness ($\bar{X} = 3.41$, $SD = 0.71$) was the highest among all cognitive factors and slightly exceeded the evaluation competency mean. This finding suggests that metacognitive awareness may be particularly important for developing digital information evaluation competency.

Table 6 presents the multiple regression analysis examining the combined effect of the three cognitive factors on digital information evaluation competency.

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
0.75	0.56	0.55	0.45

Table 7: ANOVA: Multiple Regression Analysis - Combined Effect of Cognitive Factors

Source	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	36.42	3	12.14	59.87	< 0.001
Residual	28.65	269	0.203		
Total	65.07	272			

Table 8: Regression Coefficients

Predictor Variable	**B**	**Std. Error**	**Beta (β)**	**t**	**Sig.**
(Constant)	0.52	0.18	-	2.89	0.004
Critical Thinking Skills	0.28	0.05	0.31	5.60	< 0.001
Cognitive Load Management	0.19	0.04	0.22	4.75	< 0.001
Metacognitive Awareness	0.36	0.05	0.38	7.20	< 0.001

The multiple regression analysis reveals that the three cognitive factors collectively explain a substantial proportion of variance in digital information evaluation competency. The model achieves an R^2 of 0.56, indicating that 56% of the variance in evaluation competency is explained by the combined effect of critical thinking skills, cognitive load management, and metacognitive awareness. The ANOVA results confirm that this model is statistically significant ($F(3, 269) = 59.87$, $p < 0.001$).

Examining the individual predictors, all three cognitive factors make significant unique contributions to evaluation competency. Metacognitive awareness emerges as the strongest predictor ($\beta = 0.38$, $t = 7.20$, $p < 0.001$), followed by critical thinking skills ($\beta = 0.31$, $t = 5.60$,

$p < 0.001$) and cognitive load management ($\beta = 0.22$, $t = 4.75$, $p < 0.001$). These standardized beta coefficients suggest that for every one standard deviation increase in metacognitive awareness, evaluation competency increases by 0.38 standard deviations, holding other variables constant. Similarly, critical thinking and cognitive load management contribute 0.31 and 0.22 standard deviations respectively to evaluation competency.

Discussions

The survey revealed that participants with moderate competence in digital information evaluation were 58.2% with the average of 3.32. This contradictory finding is worth close interpretation. On the one hand, it means that the majority of students already have some basic skills required to assess information. Conversely, LIS students, who will be turned into information professionals, might be required to display greater competency rates compared to the rest of the students. Moderately good competence thus might not be adequate to future librarians and information specialists who will be leading others in information evaluation.

These results are reminiscent of those of Zhao et al. (2021), which states that there is predominantly simple, but not advanced digital competence among most university students and lecturers. In the same way, Sanchez-Caballe et al. (2020) also discovered that the digital competence of university students commonly lies in the mediocre position in various settings. Even worse, Alex-Nmecha and Ejitagha (2023) found a even lower degree of digital information literacy among Nigerian LIS students, which indicates that students at the University of Maiduguri are significantly better than their peers in the rest of the world, though they are still not as good as international standards.

The moderate, and not high level of competence in the students' information evaluation can be attributed to a few factors. To begin with, the fast-paced change of digital information spaces can easily surpass the pace of curriculum, students lack the systematically taught instruction in newly arising issues of evaluation, including AI-generated content, deepfakes, or advanced fake news (Ndibalema, 2025). Second, the context-specific issues in northeastern Nigeria, such

as limited infrastructure, intermittent internet connectivity, and security concerns, limit the ability of the students to obtain experience in the area of practical evaluation by exposing them to a variety of digital resources (Friday et al., 2024). Third, conventionally LIS programmes have focused on collection management and cataloging at the expense of developing critical evaluation skills that establish cognitive skills development gaps (Virkus and Garoufallou, 2020).

The correlation between critical thinking skills and evaluation competence is very strong ($r = 0.64$) which is consistent with the theoretical position that effective information evaluation is underpinned by critical thinking. Other researchers believe that critical thinking is an overall cognitive ability which can be applied in different situations, including information assessment (Pagan Castano et al., 2023). Some insist that assessment takes domain-specific critical thinking abilities aimed at learning the information production, publication procedures, and evidence criteria, which might not be acquired in general critical thinking courses (Bakir et al., 2025). The current results are more consistent with the former perspective, suggesting that general critical thinking skills are associated with evaluation competence, though the correlational design does not permit causal inference.

This is also in line with the studies that have associated critical thinking and information literacy outcomes (Withorn et al., 2021). The fact that the percentage of variance in competence that is accounted by critical thinking is only 41, however, demonstrates that other variables, including domain knowledge, technical skills, and contextual knowledge are also important. These findings endorse a complex way of training evaluation competence as opposed to placing special emphasis on teaching critical thinking (Gross et al., 2022).

The correlation of critical thinking and evaluation competence works in a number of ways. The critical thinking helps students to interpret arguments, identify assumptions, detect logical errors, and judge the quality of evidence, which are all important abilities that help students to evaluate sources of information (Damasceno Andre et al 2025). Learners who engage in critical thinking at a higher level are well trained to doubt overficial features of sources, dig deeper to

find out credibility evidence, and avoid the tendency to accept information at face value. Moreover, critical thinking enables comparative analysis where students will uncover contradictions of different sources and combine information of various viewpoints.

Correlations also indicate that the management of cognitive loading is significant. The fact that the relationship between cognitive load management and evaluation competence is moderate positive ($r = 0.52$) is consistent with the argument of Cognitive Load Theory that managing cognitive resources is essential in difficult tasks (Tang et al., 2022). Other scholars suggest that instructional design interventions can be used to train cognitive load management (van Merriënboer and Sweller, 2024). Others argue that it is mainly an individual difference in working-memory capacity, which is comparatively stable, so its influence on the educational intervention is limited (Jiang et al., 2025). The current findings fail to clear this debate but emphasize the significance of considering cognitive loads irrespective of whether capacity is considered as malleable or stable.

Mean cognitive load management ($\overline{X}= 3.19$) was lower than other cognitive items, which means that students might have difficulties in managing cognitive demands in the process of information evaluation. This is consistent with the findings of research indicating that digital environments have excessive cognitive burdens by imposing parallel streams of information, complex interfaces, and different types of sources (Sigolo & Casarin, 2024). These results call into question the belief that digital natives are more equipped to deal with the complexity of digital information (Ndibalema, 2025).

There are other reasons that can be given to explain the relationship between cognitive load management and evaluation competence. Effective evaluation means that students need to retain evaluation criteria in working memory and at the same time process source material, judge credibility indicators, and compare sources (van Merriënboer and Sweller, 2024). Students who are able to cope with such pressures effectively are also able to stick to pertinent areas of evaluation rather than get lost in the volume of information. Efficiency and accuracy

can be improved with the help of strategies like breaking down information into chunks, the assistance of external memory, and a sequence of evaluation steps (Odularu & Bokwe, 2025).

The highest correlation ($r = 0.69$) is with evaluation competence and the highest standardized beta coefficient ($b = 0.38$) in the regression model, which may be the most important outcome of this study. This confirms that the importance of metacognition, which is knowledge and control over personal cognitive processes, is one of the key elements of the performance of expert information evaluation (Na & Jeong et al., 2020). Other researchers focus on metacognition knowledge (setting strategies and strategies that work and when) as being most vital compared to those who focus on metacognition regulation (monitoring and adjusting evaluations) as more vital (Zhu & Yang, 2023). The composite measure applied to this research is not able to differentiate these elements, yet it highlights the overall worth of metacognitive awareness.

This finding differs with certain previous studies that reported weaker connections between metacognition and information literacy outcomes, potentially because of differences in measures or other contextual issues (Haq et al, 2021). This positive correlation could be explained by the requirement of the digital information evaluation process, as students in that case must independently decide on the adequacy of the evaluation, recognize knowledge gaps, and adjust strategies, which also should be performed through the prism of strong metacognitive awareness (Li et al., 2025).

The strong relationship between metacognitive awareness and evaluation competency may operate through several mechanisms. First, metacognitive awareness enables students to recognize when their evaluation strategies are inadequate and require adjustment. Students with high metacognitive awareness may notice when they're accepting sources uncritically, when they've failed to verify important claims, or when their personal biases are influencing evaluation (Chen et al., 2025). Second, metacognitive awareness facilitates planning appropriate evaluation strategies for different types of sources and information needs. Third,

metacognitive monitoring allows students to assess whether their evaluation has been sufficiently thorough before making decisions about source credibility or information use.

The regression model explaining 56% of variance in evaluation competency through the three cognitive factors represents a substantial explanatory power. Some might argue that this indicates cognitive factors are the primary determinants of evaluation competency, with other factors (technical skills, motivation, prior knowledge) playing secondary roles. Others might contend that the 44% unexplained variance indicates the importance of additional factors beyond cognition, including affective factors, social influences, or contextual variables. The current findings support a balanced perspective: cognitive factors are clearly important explaining more than half the variance but a comprehensive model must incorporate additional dimensions (Liu, 2023; Tang et al., 2022).

The finding that all three cognitive factors make unique significant contributions challenges simpler models that focus on single cognitive dimensions. This supports arguments for multifaceted approaches to developing evaluation competency rather than emphasizing any single cognitive skill in isolation (Kong et al., 2025). The relative contributions (metacognitive awareness > critical thinking > cognitive load management) provide guidance for prioritizing educational interventions while maintaining attention to all dimensions.

The combined effect likely reflects complementary contributions of the three cognitive factors. Metacognitive awareness may enable students to recognize when evaluation is needed and monitor evaluation adequacy. Critical thinking provides the analytical tools for assessing arguments, evidence, and source characteristics. Cognitive load management ensures that cognitive resources are available for applying critical thinking and metacognitive strategies rather than being overwhelmed by information volume or complexity. These factors may interact synergistically, with metacognitive awareness guiding the application of critical thinking while cognitive load management creates cognitive capacity for both processes (Sweller et al., 2024; Damasceno André et al., 2025).

Limitations of the Study

Several limitations should be borne in mind when interpreting the findings of this study. First, all measures of cognitive factors and digital information evaluation competency were based on self-report, which is susceptible to social desirability bias; participants may over- or under-estimate their own abilities, so the scores may not fully reflect actual behavioural competencies. Second, data were collected from a single institution — the University of Maiduguri — which limits the transferability of findings to other LIS programmes or institutions, whether within Nigeria or beyond. Institutional features unique to UNIMAID, including curriculum design, available infrastructure, and the prevailing security environment in Borno State, may have shaped student responses in ways that are not generalisable. Third, the cross-sectional design captures participants' attributes at a single point in time and therefore cannot establish causal relationships. The correlational and regression findings should be interpreted as associational: they indicate that the cognitive factors examined are related to evaluation competency but do not confirm that one causes the other. Longitudinal and experimental designs would be needed to clarify directionality and causation.

Conclusion

This study examined the cognitive factors influencing digital information evaluation competency among undergraduate Library and Information Science students at the University of Maiduguri, Borno State, Nigeria. The findings revealed that students demonstrated moderate levels of digital information evaluation competency overall, with significant positive relationships between competency and three key cognitive factors: critical thinking skills, cognitive load management, and metacognitive awareness. Metacognitive awareness emerged as the strongest predictor of evaluation competency, followed by critical thinking and cognitive load management. Collectively, these three factors explained 56% of the variance in students' evaluation competency, suggesting substantial influence of cognitive dimensions while also indicating the importance of additional factors not examined in this study.

Recommendations

1. Instead of information literacy standing out as a distinct and separate component of the curriculum, LIS programmes need to incorporate explicit teaching of cognitive skills (and, in particular, metacognitive awareness) into all elements of the curriculum. These can be adding some metacognitions to tasks, offering reflection tasks that lead students to monitor their processes of evaluation, and teaching self-regulation in approaching complex information tasks.

2. Metacognitive processes can be rendered visible when faculty think aloud when it comes to evaluating the sources of information. In doing this, they must be able to demonstrate how specialists themselves oversee their own assessment and how they identify the uncertainties and adjust strategies. Such openness makes students understand how these unconscious processes operate.

3. The university should invest in professional development of LIS faculty that will focus on teaching cognitive skills and information-literacy pedagogy. This will make sure that the instructors possess the knowledge of the subject and the teaching methods that are required to develop the evaluation competence of the students.

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