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Digital Competence, Media and Information Literacy, and Artificial Intelligence Literacy among Library and Information Science Students in Uzbekistan: A Descriptive Cross-Sectional Survey

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Abstract

Purpose. Library and information science (LIS) programmes are expected to prepare graduates who can use digital technologies, evaluate media content critically and understand the role of artificial intelligence (AI) in information services. Empirical evidence on these competencies among LIS students in Uzbekistan is scarce, and existing studies rarely separate what students believe they can do from what they know. This study describes the digital competence, media and information literacy (MIL) and AI literacy of LIS students in Uzbekistan, distinguishing self-reported competence from responses to knowledge items.

Design/Methodology. A descriptive cross-sectional survey was conducted among full-time LIS students at three higher education institutions in Tashkent and Nukus (accessible population ≈ 668). Two independent online questionnaires were used: a digital competence questionnaire based on DigComp 2.2 (n = 105) and an MIL and AI literacy questionnaire based on the UNESCO MIL framework (n = 173). Data were summarised with frequencies, percentages, means, standard deviations and 95% Wilson confidence intervals.

Results. Most students rated their overall digital skill as intermediate (60.0%); only 9.5% rated it as high, and 37.1% reported being able to perform a complex database search independently. Half (51.4%) were familiar with the concept of media education, 72.8% considered it important and 76.9% favoured compulsory practice-oriented courses. Only 26.0% felt confident in verifying the reliability of sources. On single-best-answer knowledge items, 58.4% identified the principles of cyberethics, 55.5% the analytical role of AI in media content, 48.6% the components of critical evaluation and 39.9% the core principle of media security.

Conclusions. Students reported broadly positive attitudes towards media education but limited confidence in source verification, and fewer than half answered the critical-evaluation and media-security knowledge items correctly. These descriptive findings suggest priorities for LIS curricula: practice-oriented source verification, digital safety and professionally oriented AI literacy. The results describe perceived competence and selected knowledge rather than demonstrated performance and cannot be generalised beyond the participating institutions.

Keywords: digital competence; media and information literacy; artificial intelligence literacy; library and information science education; LIS students; Uzbekistan

1. INTRODUCTION

The digitalisation of library and information services is changing the professional role of librarians. Beyond acting as intermediaries between users and collections, librarians increasingly support users in finding, evaluating, interpreting and ethically reusing digital information (Sanches, 2022). Libraries are therefore expected to function as educational and innovation centres that support the development of digital, media and AI-related competencies among their users (Ganieva & Usmanova, 2024; IFLA, 2011). For LIS education, this shift raises a practical question: to what extent do current students, the future workforce of the sector, possess these competencies themselves?

International research has begun to address this question, but unevenly. A review of 60 studies found that information-literacy assessment in academic libraries is far more established than media-literacy assessment and called for emerging literacies, including generative AI, to be integrated into systematic assessment (Pinto et al., 2024). Studies of AI literacy among LIS students have so far concentrated on South Asia (Hossain et al., 2025), and studies of AI literacy among library staff on North America (Lo, 2024). In Uzbekistan, the literature on media education for library specialists is mainly conceptual and pedagogical

(Ganieva & Usmanova, 2024; Usmanova, 2023; Usmanova et al., 2025), and we are not aware of a published empirical survey that describes LIS students' digital competence, MIL and AI literacy together.

A second limitation of existing work is methodological. Many competence surveys rely on self-assessment, although self-reported digital competence can differ substantially from actual performance (Porat et al., 2018). Studies that report confidence and knowledge side by side, without separating them, risk overstating students' readiness.

This study addresses both gaps. Its aim is to describe the digital competence, media and information literacy and AI literacy of LIS students in Uzbekistan, keeping self-reported (perceived) competence, attitudes and knowledge-item results analytically separate. The study is descriptive: it does not test hypotheses or causal relationships. It addresses three research questions:

RQ1. How do LIS students in Uzbekistan perceive their digital competence in information searching, the use of office and cloud tools, and overall digital skill?

RQ2. What are LIS students' awareness of and attitudes towards media education, how confident are they in selected MIL skills, and how accurately do they answer knowledge items on critical evaluation, media security and cyberethics?

RQ3. How accurately do LIS students identify the role of AI in analysing media content?

The contribution of the study is twofold. First, it provides baseline empirical evidence on three related competency domains among LIS students in Uzbekistan, a context that is under-represented in the international LIS literature. Second, by reporting perceived competence and knowledge items separately, it shows where students' confidence and knowledge diverge, which is directly relevant to the redesign of LIS curricula.

2. LITERATURE REVIEW

2.1. Defining the three competency domains

Digital competence. Digital competence is a broad, policy-driven concept that combines technical skills with the knowledge and attitudes needed to use digital technologies confidently, critically and responsibly (Ilomäki et al., 2016). The European Digital Competence Framework for Citizens, DigComp 2.2, organises it into five areas: information and data literacy, communication and collaboration, digital content creation, safety, and problem solving (Vuorikari et al., 2022). Freiman et al. (2017) describe digital competence as a lifelong continuum in which digital skills develop together with transferable competencies. In this study, digital competence refers to students' self-reported ability to search for and evaluate information, use office and cloud-based tools, and their overall rating of their digital skill.

Media and information literacy. UNESCO uses media and information literacy (MIL) as an umbrella term for the competencies needed to access, analyse, evaluate, create and ethically use information and media content (UNESCO, 2021). MIL brings together traditions of media literacy, which focuses on understanding and critically interpreting media messages (Buckingham, 2003; Hobbs, 2021; Potter, 2019), and information literacy, which focuses on finding and evaluating information (Koltay, 2011). Following this usage, the present article uses *MIL* for the competency domain, *media literacy* only when referring to the media-related component of MIL, and *media education* for the educational process through which MIL is developed. The term *media education* also appears in the questionnaire items, because it is the established term in the Russian- and Uzbek-language literature on library education (Fedorov, 2015; Gendina, 2017).

AI literacy. AI literacy is commonly defined as a set of competencies that enable people to understand what AI is and how it works, to evaluate AI technologies critically, and to use and communicate with AI

effectively and ethically (Long & Magerko, 2020). Ng et al. (2021) identify four dimensions: knowing and understanding AI, using and applying AI, evaluating and creating AI, and AI ethics. In this study, AI literacy was operationalised narrowly, as knowledge of the role of AI in analysing media content (Section 3.5). The study therefore addresses only the *knowing and understanding* dimension of AI literacy and does not measure practical use, evaluation or ethical reasoning.

The three domains overlap (for example, evaluating sources belongs to both DigComp's information and data literacy area and to MIL), but they differ in emphasis: digital competence is centred on the use of technologies, MIL on the critical treatment of information and media content, and AI literacy on understanding and using a specific class of technologies. Treating them as related but distinguishable domains is consistent with recent recommendations for academic library assessment (Pinto et al., 2024).

2.2. Digital, media and AI competencies in LIS education and practice

Research on higher education librarians emphasises their role in helping students assess the origin, credibility and appropriate reuse of digital information (Sanches, 2022). Misinformation has increased the importance of this role: Saunders (2025) argues that combating misinformation requires an interdisciplinary approach to information literacy in which librarians are key partners, and Matanji et al. (2026) describe media literacy and fact-checking as complementary proactive and reactive responses to misinformation. Evidence from LIS students points to gaps in exactly these areas. Tsabedze (2025) found that LIS students relied heavily on social media as a news source and shared information despite being unsure of its authenticity.

Studies of AI literacy show a similar pattern of familiarity without depth. Hossain et al. (2025) found that LIS students in Bangladesh, India and Pakistan were moderately familiar with AI tools, but their AI literacy varied widely and they expressed concerns about ethical use and academic integrity. In a survey of 760 academic library employees in the United States, Lo (2024) found modest self-rated understanding of AI concepts, limited hands-on experience and gaps in discussing ethical implications. At the institutional level, Ali and Richardson (2025) concluded that library professionals must themselves become AI-literate in order to support users, and Molaudzi and Ngulube (2025) found that the absence of clear institutional strategies constrained the adoption of AI in academic libraries.

2.3. Perceived versus actual competence

Most of the studies reviewed above rely on self-report. Self-assessment is useful for describing confidence and perceived needs, but it is not a substitute for measuring performance. Porat et al. (2018) compared students' perceived and actual digital literacies and found that students were highly confident and significantly over-estimated their competencies. For this reason, the present study distinguishes four types of evidence: attitudes and awareness, perceived (self-reported) competence, knowledge assessed with single-best-answer items, and self-reported frequency or use of tools. It does not measure demonstrated performance.

2.4. The Uzbek and regional context

In the Russian- and Uzbek-language literature, media education in libraries has developed mainly as a pedagogical and theoretical field. Fedorov (2015) traced the history and theory of media education, Gendina (2017) argued for media education as a new direction in the training of library staff, and Kubrak (2022) proposed methods for developing teacher-librarians' MIL through distance learning. Shi and Zhilavskaya (2020) reviewed the media educational activities of libraries in other countries. In Uzbekistan, recent work has addressed media education in the training of library specialists (Ganieva & Usmanova, 2024), the information culture of humanities students (Usmanova, 2023) and the foundations of media literacy for

library specialists (Usmanova et al., 2025). These publications set out the rationale for including MIL in LIS curricula but do not report survey data on students' competencies.

2.5. Research gap

Three gaps follow from this review. First, there is no published empirical description of LIS students' digital competence, MIL and AI literacy in Uzbekistan. Second, survey studies of these competencies often do not separate perceived competence from knowledge, which may overstate readiness. Third, empirical work on AI literacy among LIS students comes mainly from other regions. The present study responds to these gaps with a descriptive survey that reports the three domains for LIS students in Uzbekistan and keeps the types of evidence separate.

3. METHODS

3.1. Research design

The study used a descriptive cross-sectional survey design. Its purpose was to describe the distribution of LIS students' responses in three competency domains, not to compare groups, test hypotheses or examine causal relationships. Accordingly, results are reported with descriptive statistics and confidence intervals, and interpretations offered in the Discussion are presented as possible explanations rather than tested findings.

3.2. Setting and population

The target population was full-time undergraduate LIS students in Uzbekistan. The accessible population comprised all full-time students in years 1–4 of LIS programmes at three higher education institutions: the Uzbekistan State Institute of Arts and Culture (UzSIAC) in Tashkent, its Nukus branch in the Republic of Karakalpakstan, and the Tashkent University of Information Technologies named after Muhammad al-Khwarizmi (TUIT). Together these institutions enrolled approximately 668 full-time LIS students at the time of the survey (Table 1). Students of all four years of study were eligible. Part-time and distance-learning students were not included. The two regions represented are Tashkent city and the Republic of Karakalpakstan.

Table 1. Accessible population of full-time LIS students by institution and year of study

Institution	Region	Year 1	Year 2	Year 3	Year 4	Total
Uzbekistan State Institute of Arts and Culture (UzSIAC)	Tashkent city	150	110	80	75	415
UzSIAC, Nukus branch	Republic of Karakalpakstan	27	25	37	34	123
Tashkent University of Information Technologies (TUIT)	Tashkent city	50	51	4	17 + 8a	130
Total		227	186	121	134	668

Note. a Year 4 at TUIT comprises 17 students in Uzbek-language groups and 8 students in a Russian-language group. [AUTHORS: confirm that the 8 Russian-group students are in addition to the 17; if they are included in the 17, the TUIT total is 122 and the overall total 660.]

3.3. Sampling and recruitment

A non-probability, voluntary-response approach was used. Links to the online questionnaires were sent to all full-time LIS students at the three institutions through [AUTHORS: specify channel, e.g., academic advisers / department heads / Telegram group chats of student groups] during [AUTHORS: month(s) and year of data collection]. No incentives were offered. Because participation was voluntary and only students who chose to respond are included, the sample is self-selected and is not statistically representative of all LIS students in Uzbekistan.

The MIL and AI literacy questionnaire was completed by 173 students and the digital competence questionnaire by 105 students, corresponding to approximately 25.9% and 15.7% of the accessible population, respectively. [AUTHORS: if the questionnaires recorded institution and year of study, report the number of respondents by institution and year here, so that readers can judge coverage of each site and year.]

3.4. Structure of the two questionnaires

Digital competence and MIL/AI literacy were measured with two separate questionnaires administered as two separate Google Forms. Two forms were used to keep each questionnaire short and to reduce respondent fatigue [AUTHORS: confirm or replace with the actual reason]. Students could complete either questionnaire or both. Because both questionnaires were anonymous and contained no common identifier, responses could not be linked across the two forms. The two subsamples (n = 105 and n = 173) are therefore treated as independent sets of responses. It is not known how many students completed both questionnaires, so the total of 278 refers to questionnaire responses rather than unique individuals. For the same reason, relationships between digital competence and MIL/AI literacy could not be examined at the individual level, and no such relationships are reported.

3.5. Instruments

Table 2 summarises the two instruments. The digital competence questionnaire was developed with reference to DigComp 2.2 (Vuorikari et al., 2022). The items reported here cover the information and data literacy area (searching, attention to reliable sources, complex database searching), the communication and collaboration area (use of Google services) and the digital content creation area (proficiency in office applications), together with two overall self-ratings. The DigComp areas of safety and problem solving were not covered by the reported items. The MIL and AI literacy questionnaire was developed with reference to the UNESCO MIL curriculum and competency framework (UNESCO, 2021). It contained items on awareness of and attitudes towards media education, a checklist of skills in which respondents felt confident, and four single-best-answer knowledge items on critical evaluation of media content, media security, cyberethics and the role of AI in analysing media content.

Table 2. Overview of the two questionnaires

Feature	Digital competence questionnaire	MIL and AI literacy questionnaire
Reference framework	DigComp 2.2 (Vuorikari et al., 2022)	UNESCO MIL curriculum and competency framework (UNESCO, 2021)
Respondents	n = 105	n = 173
Number of items	[AUTHORS: total number of items]	[AUTHORS: total number of items]
Domains covered by the reported items	Information and data literacy; communication and collaboration; digital content creation; overall self-rating	Awareness of and attitudes towards media education; perceived MIL skills; knowledge of critical evaluation, media security and cyberethics; knowledge of

		the role of AI in media analysis
Item and response formats	Ordinal self-ratings (3- or 4-point); multiple-response checklists	Single-choice attitude items (3- or 4-option); multiple-response confidence checklist; four single-best-answer knowledge items (four options, one correct)
Type of evidence	Perceived competence; self-reported use of tools	Attitudes and awareness; perceived competence; knowledge
Sample item	"How would you rate your overall level of digital technology skills?" (low / beginner / intermediate / high)	"What does critical evaluation of media content include?" (correct option: assessing source reliability, message intent and possible manipulative influence)
Language of administration	[AUTHORS: e.g., Uzbek and Russian]	[AUTHORS: e.g., Uzbek and Russian]

Note. The full item wording of both questionnaires is provided in [AUTHORS: Appendix A / supplementary file].

Development, translation and review. Items were drafted by the authors on the basis of the descriptors of the two frameworks. [AUTHORS: describe translation, e.g., "Items were written in Uzbek, translated into Russian by a bilingual LIS lecturer, and checked by back-translation".] [AUTHORS: describe expert review, e.g., "The draft questionnaires were reviewed by N experts in LIS education and information technology, who assessed the relevance and clarity of each item; items were revised accordingly". If no expert review took place, delete this sentence and state this in the Limitations.] [AUTHORS: describe pilot testing, e.g., "The questionnaires were piloted with N students who were not included in the final sample, and ambiguous wording was corrected". If no pilot took place, delete and state this in the Limitations.]

Reliability and validity. Most items in both questionnaires are single-indicator categorical items, multiple-response checklists or single-best-answer knowledge items, rather than multi-item scales intended to measure one latent construct. Internal-consistency coefficients such as Cronbach's alpha or McDonald's omega are therefore not applicable to the results reported here, and none are claimed. [AUTHORS: if either questionnaire contains a block of Likert-type items intended as a scale, compute and report Cronbach's alpha / McDonald's omega for that block from the raw data.] Alignment of the items with DigComp 2.2 and the UNESCO MIL framework supports content coverage but does not by itself establish the validity of the questionnaires; no evidence of construct validity (such as factor analysis) is available. Results are therefore reported at the level of individual items, and composite competence scores are not computed.

Scoring of knowledge items. Each knowledge item had one correct option. Several incorrect options combined a correct element with an incorrect one (for example, "counting views and comments alongside assessing manipulative influence"). Such items test whether respondents can identify the complete and correct description, and incorrect responses should not be read as a complete absence of knowledge.

3.6. Data analysis

Technical fields generated automatically by Google Forms (timestamps, scoring and feedback columns) were removed before analysis. All responses received were complete and were retained [AUTHORS: confirm; if incomplete or duplicate responses were removed, state how many]. For each item, frequencies and percentages were computed with 95% confidence intervals using the Wilson score method (Wilson, 1927), which is recommended for proportions in moderate samples. For three-point ordinal self-ratings, responses were coded 1–3 and summarised with the mean, standard deviation and median for descriptive purposes only. Multiple-response items are reported as the percentage of respondents selecting each option

and do not sum to 100%. Because the two subsamples could not be linked and the design is descriptive, no inferential comparisons between subsamples were made. Comparisons between perceived-competence items and knowledge items are made descriptively at the aggregate level. Analyses were carried out in [AUTHORS: software, e.g., IBM SPSS Statistics 27 / Python 3 with SciPy].

3.7. Ethical considerations

Participation was voluntary and anonymous. Before starting the questionnaire, students were informed of the purpose of the study, that participation was voluntary and that they could stop at any time; submitting the form was taken as consent. No personally identifiable information was collected. [AUTHORS: add ethics approval statement, e.g., “The study was approved by the <committee name> of <institution>, protocol No. ___, date ___”, or explain why formal approval was not required under institutional rules.]

4. RESULTS

4.1. Respondents

The analysis includes 173 responses to the MIL and AI literacy questionnaire and 105 responses to the digital competence questionnaire from full-time LIS students at the three institutions (Section 3.3). [AUTHORS: if available, report respondents’ distribution by institution, year of study and gender.]

4.2. Perceived digital competence (RQ1)

Table 3 presents students’ self-reported digital competence. Most students rated their overall digital skill as intermediate (60.0%, 95% CI [50.4, 68.9]), and 9.5% [5.3, 16.6] rated it as high. A similar pattern appeared for the level at which students used digital tools in their studies: 59.0% reported an intermediate or sufficient level and 21.9% a high level (M = 2.03, SD = 0.64 on a 1–3 scale).

For information searching, 60.0% [50.4, 68.9] reported that they regularly paid attention to the reliability or scientific status of sources. Google was the most frequently used search engine (89.5%). Just over a third of students (37.1% [28.5, 46.7]) reported being able to carry out a complex search in an electronic library or database independently; most (58.1%) could do so only partially or with assistance. Students most often reported sufficient proficiency in MS Word (69.5%) and Excel (66.7%). Among Google services, Google Drive (52.4%) and Google Docs (44.8%) were used most often, and Google Forms (21.0%) and Google Sheets (15.2%) least often.

Table 3. Self-reported digital competence of LIS students (digital competence questionnaire, n = 105)

Item	Response	n	% [95% CI]
Overall self-ratings (perceived competence)	Overall self-ratings (perceived competence)	Overall self-ratings (perceived competence)	Overall self-ratings (perceived competence)
Overall level of digital technology skillsa	Low	13	12.4 [7.4, 20.0]
	Beginner	19	18.1 [11.9, 26.5]
	Intermediate	63	60.0 [50.4, 68.9]
	High	10	9.5 [5.3, 16.6]
Level of digital-tool use for study (M = 2.03, SD = 0.64, Mdn = 2)	Low	20	19.0 [12.7, 27.6]
	Intermediate / sufficient	62	59.0 [49.5, 68.0]

	High	23	21.9 [15.1, 30.7]
Information and data literacy	Information and data literacy	Information and data literacy	Information and data literacy
Attention to reliable or scientific sources (M = 2.56, SD = 0.57, Mdn = 3)	No, rarely	4	3.8 [1.5, 9.4]
	Sometimes	38	36.2 [27.6, 45.7]
	Yes, regularly	63	60.0 [50.4, 68.9]
Ability to perform a complex search in an e-library or database (M = 2.32, SD = 0.56, Mdn = 2)	No, needs help	5	4.8 [2.1, 10.7]
	Partially / with assistance	61	58.1 [48.5, 67.1]
	Independently and effectively	39	37.1 [28.5, 46.7]
Search engines used most (use)b	Google	94	89.5 [82.2, 94.0]
	Yandex	39	37.1 [28.5, 46.7]
	Yahoo	7	6.7 [3.3, 13.1]
Digital content creation	Digital content creation	Digital content creation	Digital content creation
Office applications used with sufficient proficiency (perceived competence)b	MS Word	73	69.5 [60.2, 77.5]
	MS Excel	70	66.7 [57.2, 75.0]
	MS PowerPoint	55	52.4 [42.9, 61.7]
Communication and collaboration	Communication and collaboration	Communication and collaboration	Communication and collaboration
Google services used (use)b	Google Drive	55	52.4 [42.9, 61.7]
	Google Docs	47	44.8 [35.6, 54.3]
	Google Forms	22	21.0 [14.3, 29.7]
	Google Sheets	16	15.2 [9.6, 23.3]

Note. CI = Wilson score confidence interval. Means are reported for three-point items coded 1 (lowest) to 3 (highest). a Response options are listed in the order in which they appeared in the questionnaire; because the ordering of “low” and “beginner” is ambiguous, no mean is reported for this item. b Multiple-response item; percentages do not sum to 100%.

4.3. Media and information literacy (RQ2)

Awareness and attitudes. About half of the students (51.4% [44.0, 58.8]) reported being familiar with the concept of media education, 43.4% had heard of it but not in depth, and 5.2% encountered it for the first time (Table 4). Most considered media education important (72.8% [65.8, 78.9]). A majority (60.7%) stated that the current curriculum covered media education sufficiently, yet 76.9% [70.1, 82.5] favoured strengthening it through compulsory practice-oriented courses, and a further 15.6% through elective courses.

Table 4. Awareness of and attitudes towards media education (MIL and AI literacy questionnaire, n = 173)

Item	Response	n	% [95% CI]
Familiarity with the concept of media education	Familiar	89	51.4 [44.0, 58.8]
	Heard of it, but not in depth	75	43.4 [36.2, 50.8]
	First encounter	9	5.2 [2.8, 9.6]
Media education is important	Yes	126	72.8 [65.8, 78.9]
	Partly	44	25.4 [19.5, 32.4]
	No	3	1.7 [0.6, 5.0]
Current curriculum covers media education sufficiently	Yes	105	60.7 [53.3, 67.7]
	Partly	58	33.5 [26.9, 40.9]
	No	10	5.8 [3.2, 10.3]
How media education should be strengthened	As compulsory practice-oriented courses	133	76.9 [70.1, 82.5]
	Only as elective courses	27	15.6 [11.0, 21.8]
	Difficult to answer	10	5.8 [3.2, 10.3]
	Not needed; current preparation is sufficient	3	1.7 [0.6, 5.0]

Note. CI = Wilson score confidence interval. All items are attitude or awareness items.

Perceived MIL skills. Students most often reported confidence in preparing presentations (57.8% [50.4, 64.9]), working with electronic catalogues (49.1%) and searching for scientific information (45.1%). Confidence in verifying the reliability of sources was reported by 26.0% [20.0, 33.0], the lowest of the four skills listed (Table 5).

Knowledge items. On the critical-evaluation item, 48.6% [41.2, 56.0] chose the correct option (assessing source reliability, message intent and possible manipulative influence). The most frequent incorrect options combined counting views and comments with assessing manipulation (19.7%) or focused only on the visual design of materials (19.7%). On the media-security item, 39.9% [32.9, 47.3] chose the correct option (complying with safety norms and preventing threats in the information and communication environment); 27.2% chose an option centred on promoting media materials and 24.3% an option involving downloading materials without verification. The cyberethics item was answered correctly by 58.4% [50.9, 65.5], with 22.0% choosing an option that combined internet-marketing methods with data protection.

4.4. AI literacy (RQ3)

On the AI item, 55.5% [48.0, 62.7] correctly identified the role of AI in analysing media content as automated text processing, detection of disinformation or manipulation, and semantic analysis (Table 5). The most frequent incorrect option, chosen by 28.3% [22.1, 35.5], combined the generation of random images with manipulation detection and semantic analysis. A further 11.0% chose an option stating that AI is used to produce disinformation.

Table 5. Perceived MIL skills and knowledge items (MIL and AI literacy questionnaire, n = 173)

Item	Response	n	% [95% CI]
Perceived competence: skills	Perceived competence: skills	Perceived competence: skills	Perceived competence: skills

respondents feel confident in (multiple response)	respondents feel confident in (multiple response)	respondents feel confident in (multiple response)	respondents feel confident in (multiple response)
	Preparing presentations	100	57.8 [50.4, 64.9]
	Working with electronic catalogues	85	49.1 [41.8, 56.5]
	Searching for scientific information	78	45.1 [37.9, 52.5]
	Verifying the reliability of sources	45	26.0 [20.0, 33.0]
Knowledge: media and information literacy (single best answer)	Knowledge: media and information literacy (single best answer)	Knowledge: media and information literacy (single best answer)	Knowledge: media and information literacy (single best answer)
What critical evaluation of media content includes	Correct: assessing source reliability, message intent and possible manipulative influence	84	48.6 [41.2, 56.0]
	Counting views and comments alongside assessing manipulative influence	34	19.7 [14.4, 26.2]
	Evaluating only the visual design of materials	34	19.7 [14.4, 26.2]
	Retelling information without analysis	21	12.1 [8.1, 17.8]
Core element of media security	Correct: complying with safety norms and preventing threats in the information and communication environment	69	39.9 [32.9, 47.3]
	Promoting media materials digitally while preventing threats	47	27.2 [21.1, 34.2]
	Downloading digital materials without verification while preventing threats	42	24.3 [18.5, 31.2]
	Rapid publication of information	15	8.7 [5.3, 13.8]
Cyberethics in library and information work	Correct: safe online behaviour, personal-data protection, preventing digital risks	101	58.4 [50.9, 65.5]
	Internet-marketing methods plus data protection	38	22.0 [16.4, 28.7]
	Working with traditional card catalogues	22	12.7 [8.5, 18.5]
	Creating media products as a	12	6.9 [4.0, 11.7]

	creative activity		
Knowledge: AI literacy (single best answer)	Knowledge: AI literacy (single best answer)	Knowledge: AI literacy (single best answer)	Knowledge: AI literacy (single best answer)
Role of AI technologies in analysing media content	Correct: automated text processing, detecting disinformation or manipulation, semantic analysis	96	55.5 [48.0, 62.7]
	Generating random images plus detecting manipulation and semantic analysis	49	28.3 [22.1, 35.5]
	Automated text processing and producing disinformation	19	11.0 [7.1, 16.5]
	Adjusting visual parameters of images plus semantic analysis	9	5.2 [2.8, 9.6]

Note. CI = Wilson score confidence interval. The confidence checklist is a multiple-response item; percentages do not sum to 100%.

4.5. Perceived competence and knowledge at a glance

Figure 1 brings together the main perceived-competence and knowledge indicators from both questionnaires. Correct-answer rates on the four knowledge items ranged from 39.9% to 58.4%; none exceeded 60%. Among perceived-competence indicators, the proportion of students confident in verifying the reliability of sources (26.0%) was lower than the proportion who correctly identified the components of critical evaluation (48.6%), and the two confidence intervals did not overlap. Because these two items measure different things (confidence in a skill and recognition of a definition), this contrast is descriptive and is not a test of a difference.

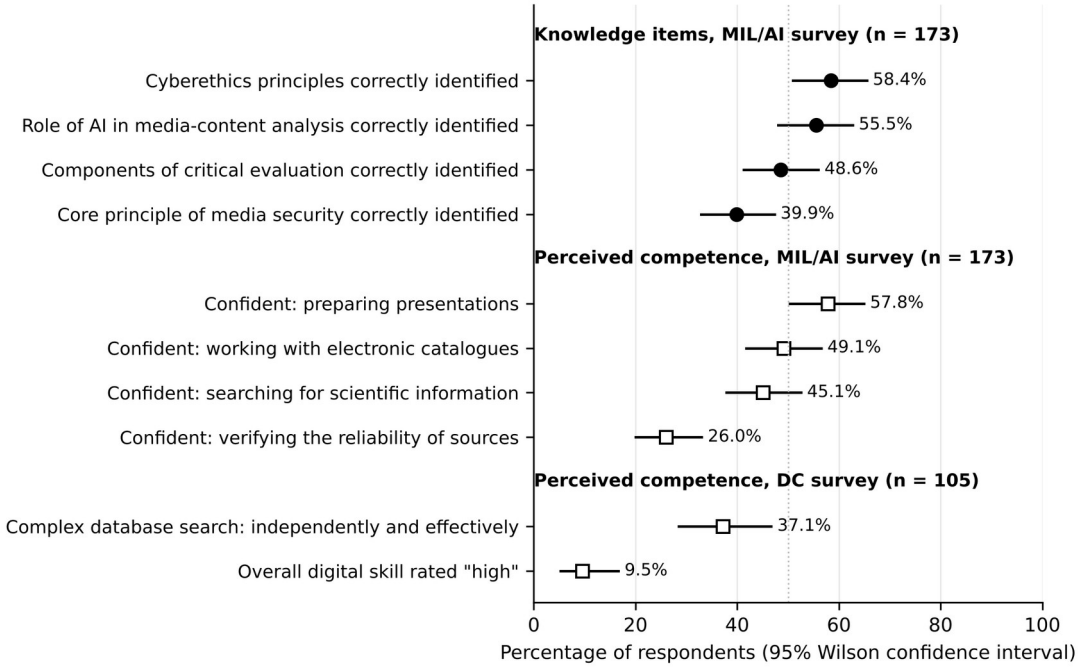

Figure 1. Knowledge-item accuracy and perceived competence of LIS students with 95% Wilson confidence intervals. Filled circles: knowledge items (percentage answering correctly). Open squares: perceived competence (percentage reporting confidence or the highest response level).

5. DISCUSSION

This study described the digital competence, MIL and AI literacy of LIS students at three institutions in Uzbekistan, keeping perceived competence, attitudes and knowledge separate. Three findings stand out: students' attitudes towards media education were clearly positive; their confidence in source verification and their knowledge of critical evaluation and media security were limited; and their understanding of AI in media analysis was partial.

5.1. Perceived digital competence

Students mostly placed their digital skills at an intermediate level, and relatively few reported being able to perform a complex database search independently. Their reported tool use centred on standard office applications, Google Drive and Google Docs, while tools that require more structured work with data, such as Google Sheets and Forms, were used less. Because these are self-ratings, they describe how students see themselves rather than what they can do; Porat et al. (2018) showed that such self-ratings can over-estimate actual performance. Even taken at face value, the results suggest that routine use of digital tools is widespread, while the competencies that DigComp 2.2 places in the information and data literacy and content creation areas, such as advanced searching and structured data handling, are less developed (Vuorikari et al., 2022). This is consistent with a view of digital competence as a continuum that extends beyond everyday technology use (Freiman et al., 2017; Ilomäki et al., 2016). The DigComp areas of safety and problem solving were not covered by the reported items, so no conclusion can be drawn about them from this questionnaire.

5.2. Media and information literacy: positive attitudes, limited verification

Most students considered media education important and wanted it strengthened through compulsory, practice-oriented courses. At the same time, a majority stated that the current curriculum covered media education sufficiently. One possible interpretation is that students regard the theoretical coverage as adequate but want more practical training; this interpretation was not tested and would need to be examined in future research, for example through interviews or an analysis of course syllabi.

The clearest gap concerned source verification. Only about a quarter of students felt confident in verifying the reliability of sources, the lowest of the skills listed, and fewer than half recognised the complete definition of critical evaluation. Fewer than half also identified the core principle of media security. These results are consistent with Tsabedze's (2025) finding that LIS students shared information despite doubts about its authenticity, and with Pinto et al.'s (2024) observation that media-literacy assessment and teaching lag behind information literacy in academic libraries. Because librarians are expected to help users judge the origin and credibility of information (Sanches, 2022) and to take part in responses to misinformation (Matanji et al., 2026; Saunders, 2025), verification and digital safety appear to be priority areas for LIS curricula.

The pattern of incorrect answers is also informative. Many incorrect options combined a correct element with an irrelevant or inappropriate one, such as counting views and comments, or promoting and downloading materials. A plausible reading is that students recognise some relevant concepts but do not yet distinguish the essential components of critical evaluation and media security from superficial or unsafe practices. This reading is a hypothesis; confirming it would require performance-based tasks.

5.3. AI literacy

Just over half of the students correctly identified the analytical role of AI in media content, while more than a quarter chose an option that included generating random images. This may reflect the public visibility of generative AI tools, but this explanation was not tested. The result resembles the findings of Hossain et al. (2025), who described LIS students' AI literacy as uneven, and of Lo (2024), who found modest conceptual understanding of AI among academic library employees. Since AI literacy in this study was measured by a single knowledge item, the findings concern only one aspect of the *knowing and understanding* dimension of AI literacy (Ng et al., 2021). They say nothing about students' ability to use AI tools in library services or to reason about the ethics of AI. Developing these further dimensions in LIS education is likely to require both curricular change and institutional guidance (Ali & Richardson, 2025; Molaudzi & Ngulube, 2025).

5.4. Implications for LIS education

Within the limits of a descriptive study, the findings point to three practical priorities for LIS programmes in Uzbekistan. First, source verification and fact-checking could be taught through practical exercises with real information sources rather than through definitions alone. Second, digital and media safety, including the protection of personal data, could be addressed explicitly, since it was among the least accurately answered areas. Third, AI literacy could be developed beyond general familiarity, towards understanding how AI is applied to information retrieval, content analysis and library services, and towards the ethical questions such applications raise. These recommendations follow from the response patterns described above; their effectiveness would need to be evaluated in intervention studies.

5.5. Limitations

Several limitations should be considered. First, the sample was self-selected and drawn from three institutions in two regions, with response proportions of approximately 26% and 16% of the accessible population. Students who chose to respond may differ from those who did not, and the findings cannot be generalised to all LIS students in Uzbekistan or to students at other institutions. Second, the two questionnaires were completed by two unlinked subsamples, so relationships between digital competence, MIL and AI literacy could not be examined at the individual level. Third, most results are based on self-report and therefore describe perceived competence; the knowledge items measure recognition of correct descriptions; demonstrated performance was not measured. Fourth, the questionnaires were developed by the authors with reference to international frameworks, but evidence of their construct validity is not available, and AI literacy was measured with a single item. [AUTHORS: if no expert review or pilot test took place, add: "The questionnaires were not subjected to formal expert review or pilot testing."] Fifth, the data are cross-sectional and do not allow conclusions about change over time or about the effects of the curriculum.

Future research should use linked, validated multi-item scales that cover all DigComp areas and all dimensions of AI literacy, include performance-based tasks such as verifying the credibility of real sources, and draw on probability samples from all institutions offering LIS programmes in Uzbekistan. With such data, correlational analyses of the relationships between the three domains, and their association with students' perceived professional readiness, would become possible.

6. CONCLUSION

This descriptive survey provides baseline evidence on the digital competence, media and information literacy and AI literacy of LIS students at three institutions in Uzbekistan. Students generally rated their digital skills as intermediate and expressed strong support for practice-oriented media education. However, only a quarter felt confident in verifying the reliability of sources, and fewer than half correctly answered the knowledge items on critical evaluation and media security. Just over half correctly identified the analytical

role of AI in media content. These findings do not measure demonstrated performance and are not generalisable beyond the participating institutions, but they identify source verification, digital safety and professionally oriented AI literacy as areas that merit attention in the development of LIS curricula in Uzbekistan.

DECLARATIONS

Data availability. [AUTHORS: e.g., “The anonymised survey data are available from the corresponding author on reasonable request” or a repository link.]

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