DIGITAL LITERACY AND THE DEVELOPMENT OF ENGLISH LANGUAGE SKILLS AMONG UNIVERSITY STUDENTS IN UZBEKISTAN: A PRISMA-GUIDED SYSTEMATIC REVIEW

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Abstract

Digital literacy has become a core competence for university students learning English in technology-rich environments. It includes not only the technical ability to operate digital tools but also the capacity to locate, evaluate, create, communicate, and use information critically and responsibly. This PRISMA-guided systematic review synthesizes international and Uzbekistan-specific evidence on how digital literacy contributes to the development of English language skills among university students. The review focuses on reading, writing, listening, speaking, vocabulary, communicative competence, learner autonomy, and online learning capacity. Evidence from systematic reviews, meta-analyses, and empirical studies indicates that digital literacy can support language learning by improving access to authentic resources, critical information evaluation, multimodal comprehension, digital communication, content creation, feedback use, and self-regulated learning. Recent meta-analytic evidence also links digital literacy to academic achievement more broadly. In English as a foreign language contexts, digital competence interacts with students' approaches to learning and may be weakened by technostress, unequal access, low information-evaluation skills, and insufficient pedagogical support. Emerging evidence from Uzbekistan points in the same general direction but remains limited in scale and methodological strength. The review concludes that digital literacy should be treated as an integrated language-learning competence rather than a separate technical skill and recommends its systematic incorporation into university English curricula in Uzbekistan.

Keywords: digital literacy; English language skills; digital competence; English as a foreign language; higher education; university students; Uzbekistan; systematic review

1. Introduction

University English learning increasingly takes place in a digital information environment. Students read online texts, search databases, communicate through digital platforms, prepare multimedia assignments, use online dictionaries and corpora, participate in video discussions, and receive feedback through learning management systems and artificial intelligence-supported applications. As a result, English proficiency and digital literacy are becoming increasingly interconnected.

Digital literacy is broader than the ability to operate a computer or mobile device. Gilster's foundational account emphasized the ability to understand and use information from multiple digital sources. Later frameworks expanded the concept to include information literacy, communication and collaboration, digital content creation, safety, problem solving, and critical evaluation. Ng (2012) similarly conceptualized digital literacy through technical, cognitive, and socio-emotional dimensions. These perspectives are highly relevant to language learning because English students must not only access digital information but also interpret, evaluate, communicate, and create meaning through it.

Recent research has strengthened the empirical case for digital literacy in education. A 2025 meta-analysis by Li and colleagues examined the causal relationship between digital literacy and academic achievement and concluded that digital literacy has a positive role in student achievement, while the magnitude varies across learner and study characteristics. In the English-language domain, systematic

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reviews increasingly identify digital literacy as a condition that shapes students' ability to benefit from online and technology-enhanced language learning.

For university learners of English as a foreign language, digital competence can affect both what students learn and how they learn. Niu and Wang (2022) showed that digital EFL learning is connected to students' approaches to learning, digital competence, and technostress. This is important because access to technology alone does not guarantee productive learning. Students require the competence to identify reliable information, select appropriate digital tools, manage distractions, communicate responsibly, and transform digital resources into meaningful language practice.

In Uzbekistan, digitalization of higher education and increasing use of online English resources make this relationship especially important. Local scholarship has begun to address digital competence in English language teaching and the role of digital literacy in university English acquisition, but the evidence remains fragmented. A systematic synthesis can therefore clarify the mechanisms through which digital literacy may support English development and identify priorities for research and curriculum design.

Research Questions

RQ1. How does digital literacy contribute to English language learning among university students?

RQ2. Which dimensions of digital literacy are most relevant to reading, writing, listening, speaking, vocabulary, and communicative competence?

RQ3. What mechanisms connect digital literacy with learner autonomy, engagement, and online learning capacity?

RQ4. What does the available evidence suggest for higher education in Uzbekistan?

RQ5. What methodological and pedagogical gaps should future Uzbekistan-based research address?

2. Methodology

This study is a PRISMA-guided structured systematic review. It does not use a simulated respondent dataset and does not present fabricated statistical results. Quantitative values are reported only when they are explicitly attributed to published studies. The review follows the reporting logic of PRISMA 2020 for transparent eligibility criteria, information sources, search concepts, selection principles, data extraction, quality appraisal, and synthesis.

The review was developed around searches of scholarly sources relevant to digital literacy, digital competence, English language learning, higher education, and Uzbekistan. For a final journal database update, the following core search should be adapted to Scopus, Web of Science Core Collection, ERIC, and Google Scholar: ("digital literacy" OR "digital competence" OR "information literacy" OR "digital skills") AND ("English language" OR EFL OR ESL OR "second language") AND (reading OR writing OR listening OR speaking OR vocabulary OR proficiency OR "communicative competence" OR autonomy) AND ("university student*" OR undergraduate* OR "higher education"). A contextual search should additionally include (Uzbekistan OR Uzbek*).

Eligible publications examine digital literacy or digital competence in relation to English/second-language learning, language skills, academic learning, online learning capacity, learner autonomy, or closely related mechanisms. Priority is given to peer-reviewed systematic reviews, meta-analyses, and empirical studies involving university students. Uzbekistan-specific publications are retained for contextual synthesis even where the local evidence is methodologically smaller than the international literature. Studies lacking identifiable methods, verifiable publication details, or relevant learning outcomes are not used as core evidence.

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For each key publication, the synthesis records author and year, context, population, digital-literacy focus, language or learning outcome, design, principal finding, and methodological limitation. Language outcomes are organized into receptive skills (reading and listening), productive skills (writing and speaking), vocabulary/communicative competence, and indirect mechanisms such as autonomy, engagement, teacher support, and online learning power.

Methodological confidence is appraised qualitatively. Meta-analyses and systematic reviews receive greater evidentiary weight when their search strategy, inclusion criteria, study coverage, and limitations are transparent. Primary studies are assessed in relation to sample size, measurement validity, design, and clarity of analysis. Uzbekistan-specific conference and small-sample studies are treated as emerging contextual evidence rather than equivalent substitutes for large meta-analyses. Because the evidence is heterogeneous, the review uses narrative synthesis and does not calculate a new pooled effect size.

The review follows PRISMA 2020 reporting principles but does not invent numerical screening totals. A journal-submission version should complete the numerical PRISMA flow diagram only after the final database searches are rerun and the actual database exports, duplicate-removal records, full-text exclusions, and inclusion decisions are retained.

3. Results

Across the literature, digital literacy is consistently treated as more than technical proficiency. Its language-learning value arises from the interaction of technical skills, information evaluation, communication, content creation, and critical judgment. For English learners, these dimensions translate into the ability to locate appropriate input, evaluate the reliability and linguistic quality of online resources, communicate through digital media, create English content, and solve learning problems independently.

Mahendra et al. (2024), in a systematic literature review of digital literacy in English language learning, identified digital literacy as an increasingly important research theme connecting technology use with English learning processes. The review reinforces the idea that digital literacy should be embedded in learning activity rather than taught only as generic computer competence.

The broader educational evidence provides an important foundation for the language-specific literature. Li et al. (2025) conducted a meta-analysis on the causal relationship between digital literacy and academic achievement. Their synthesis supports a positive role for digital literacy in achievement, while also showing that outcomes depend on learner and study characteristics. This matters for English education because language learning in digital environments requires many of the same competencies: information selection, critical evaluation, self-management, and effective use of learning technologies.

Technology-supported learning can itself strengthen digital literacy. A 2025 meta-analysis of 56 experimental and quasi-experimental studies examined the effectiveness of technology-supported learning for improving students' digital literacy. Together, these findings suggest a reciprocal relationship: digital literacy can enable more effective learning, while well-designed technology-supported learning can further develop digital literacy.

Reading is one of the clearest points of intersection between digital literacy and English proficiency. Digital reading requires learners to navigate hyperlinks, evaluate source credibility, interpret multimodal information, distinguish relevant from irrelevant content, and integrate information across sources. These processes extend beyond conventional decoding and comprehension.

A recent systematic review specifically examining digital literacy for developing reading skills in EFL contexts concluded that digital literacy supports reading comprehension, critical reading,

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engagement, and collaborative learning through digital texts and tools. The same review identified unequal technology access, limited teacher readiness, and insufficient digital-reading skills as continuing constraints. For university students, this means that digital reading instruction should explicitly teach source evaluation, strategic searching, annotation, comparison of sources, and critical interpretation.

Digital literacy supports writing through information search, source evaluation, digital drafting, collaborative composition, revision, citation management, and multimodal content creation. A digitally literate student is better positioned to distinguish reliable from unreliable evidence, organize digital sources, use online reference tools, and revise written output through feedback.

However, digital writing also creates risks. Easy access to machine-generated or copied content can encourage superficial composition if students lack critical and ethical digital-literacy skills. Therefore, university English writing should integrate source evaluation, paraphrasing, citation, authorship, responsible use of digital assistance, and reflective revision. Digital literacy in writing is consequently both a productive language competence and an academic-integrity competence.

Speaking development benefits from the communicative dimension of digital literacy. Video conferencing, asynchronous video, voice recording, mobile applications, automatic speech recognition, conversational platforms, and immersive environments can increase opportunities for oral production and self-monitoring.

A systematic review of digital literacy and speaking instruction synthesized empirical research on digital tools used for pronunciation, fluency, confidence, and speaking practice. It reported broadly positive contributions from mobile-assisted applications, artificial intelligence-based platforms, automatic speech recognition, asynchronous video discussion, and immersive environments, while also identifying unequal access, limited teacher digital literacy, curriculum constraints, and inconsistent learner engagement. The evidence therefore indicates that speaking gains depend on both technological access and the competence to use digital communication tools purposefully.

Listening in digital environments is increasingly multimodal. Learners interact with video, podcasts, captions, transcripts, visual cues, playback controls, and online discussion. Digital literacy enables students to choose appropriate resources, adjust difficulty, use captions strategically, verify unfamiliar language, and combine auditory and visual information. These affordances can improve comprehension, but they can also increase cognitive load when learners process too many information channels simultaneously.

The implication is that listening instruction should include digital strategy training. Students need to know when captions support comprehension, how to replay selectively, how to take digital notes, how to verify vocabulary, and how to move from supported listening toward independent comprehension.

Niu and Wang (2022) provide an important university-level perspective by examining digital EFL learning in relation to approaches to learning, digital competence, and technostress. Their work demonstrates that digital competence is embedded in a broader learning system: students' learning approaches influence how effectively they engage with digital English learning, while technostress can undermine the benefits of technology. This finding challenges technology-deterministic assumptions. More tools do not necessarily produce better English; students must possess the competence and learning strategies required to use those tools productively.

A 2024 study of 348 EFL undergraduates further examined digital literacy and online learning power, including the mediating role of perceived teacher support. This evidence highlights that teacher support remains relevant even in highly digital learning environments. Digital literacy should therefore

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be understood as a learner competence that operates within pedagogical and social support systems rather than as purely independent self-study.

A 2025 systematic literature review of mobile-assisted language learning in higher education reported substantial potential for vocabulary, grammar, listening, speaking, writing, motivation, engagement, and autonomy. It also emphasized technical barriers, pedagogical concerns, teacher training, student readiness, and institutional support. These findings are directly relevant to digital literacy because students who cannot evaluate tools, manage digital learning, or communicate effectively online may not benefit fully from mobile-assisted learning opportunities.

The Uzbekistan-specific evidence is emerging rather than mature. Suyunova (2025), writing in the context of the Uzbek State World Languages University, discusses how mobile applications, online dictionaries, educational YouTube channels, and AI-powered language assistants can support English acquisition, motivation, and autonomy among university students. Because this publication is a short conference contribution, it is best interpreted as contextual evidence and pedagogical argument rather than high-level causal evidence.

Khatamova and Sayfiddinova (2023) examined digital competence in English language teaching in Uzbekistan and emphasized digital competence as a key twenty-first-century capacity for learning and professional development. More recent Uzbekistan scholarship has similarly argued that digital literacy is becoming a structural requirement for effective English language teaching in higher education, while noting uneven integration and teacher competence as continuing challenges.

An exploratory 2025 study involving 25 Uzbek undergraduate EFL learners reported a strong positive association between digital literacy and communicative competence. The small sample and correlational design mean that the reported association should not be interpreted as causal, but the study provides locally relevant evidence supporting further, larger investigations. Overall, Uzbekistan evidence is consistent with the international literature in direction, but stronger multi-university designs are needed.

Study	Context / sample	Focus	Design	Main evidence	Interpretation
Niu & Wang (2022)	University EFL learners	Digital competence, learning approach, technostress	Empirical university study	Digital EFL learning is shaped by competence, learning approach and technostress	Strong mechanism-oriented evidence
Mahendra et al. (2024)	English-learning literature	Digital literacy in English learning	Systematic literature review	Digital literacy is an expanding component of technology-mediated English learning	Useful field-level synthesis
Li et al. (2025)	Multi-study educational evidence	Digital literacy and academic achievement	Meta-analysis	Supports a positive role of digital literacy	High-level general evidence

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				in achievement	
Martinez et al. (2025)	Higher education EFL	Mobile-assisted language learning	Systematic literature review	Benefits across language skills, motivation, engagement and autonomy; implementation barriers remain	Strong higher-education relevance
Luthfia (2026)	EFL reading literature	Digital literacy and reading	Systematic review	Supports comprehension, critical reading, engagement and collaboration	Skill-specific evidence
Triastani (2024/2026 indexed)	Speaking research	Digital literacy and speaking	Systematic literature review	Digital tools support pronunciation, fluency and confidence; access and teacher competence constrain outcomes	Skill-specific evidence
Suyunova (2025)	Uzbek university context	Digital literacy and English acquisition	Conference paper	Highlights digital tools, motivation and autonomy	Emerging contextual evidence
Ergasheva (2025)	25 Uzbek undergraduates	Digital literacy and communicative competence	Correlational study	Reports strong positive association	Promising but small-sample local evidence

Table 1. Comparative synthesis of selected evidence on digital literacy and English language learning.

4. Discussion

The synthesis supports a clear conceptual conclusion: digital literacy is not external to English proficiency in contemporary higher education. It increasingly forms part of the conditions through which students access language input, evaluate information, communicate, create texts, receive feedback, and regulate independent learning. The relationship is therefore best understood as enabling rather than mechanically causal.

The strongest evidence supports several pathways. Information and critical literacy can strengthen digital reading and academic writing; communication literacy can expand speaking and collaborative interaction; technical and strategic competence can support listening and mobile learning; and self-

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regulatory digital skills can increase autonomy and online learning capacity. These dimensions interact rather than operate independently.

The literature also warns against equating frequent technology use with high digital literacy. Students may use smartphones intensively while lacking the ability to evaluate sources, manage academic information, protect privacy, avoid distraction, or select effective learning strategies. English programs should therefore assess functional and critical digital competence rather than relying on self-reported frequency of technology use.

For Uzbekistan, the international evidence provides a strong theoretical and empirical foundation, but it should not be treated as a substitute for local evidence. Existing Uzbekistan publications demonstrate relevance and emerging positive associations, yet the evidence base remains small. Multi-university studies should examine digital literacy using validated multidimensional instruments and objective English outcomes across reading, writing, listening, and speaking.

Teacher support is another central implication. The study of EFL undergraduates and online learning power indicates that perceived teacher support can shape how digital literacy translates into learning capacity. Universities should therefore avoid a model in which digitalization simply transfers responsibility to students. Effective digital English education requires digitally competent teachers, explicit strategy instruction, well-designed tasks, and institutional support.

• Integrate digital literacy outcomes directly into English-language course learning outcomes rather than treating them as a separate ICT module.

• Teach critical online reading, source credibility evaluation, digital note-taking, and information synthesis alongside reading comprehension.

• Integrate digital authorship, citation, paraphrasing, collaborative drafting, and responsible AI/tool use into academic writing.

• Use voice recording, video discussion, speech-recognition and interactive platforms for structured speaking practice, accompanied by reflection and feedback.

• Teach listening strategies for multimodal environments, including purposeful use of captions, transcripts, playback controls, and online dictionaries.

• Assess digital competence multidimensionally: technical, information, communication, content-creation, critical, ethical, and self-regulatory skills.

• Provide professional development for English teachers in digital pedagogy and not only in operation of software.

• Conduct larger Uzbekistan-based studies using validated digital-literacy scales and standardized English proficiency measures.

This review is PRISMA-guided but does not report fabricated numerical screening counts. A fully registered journal systematic review should rerun and archive the final searches in Scopus, Web of Science, ERIC, and other selected databases and then report exact identification and exclusion numbers. The evidence base is heterogeneous, and some Uzbekistan-specific sources are conference or small-sample studies. Accordingly, they are used to establish contextual relevance rather than to make strong causal claims. The rapid evolution of digital and AI-supported learning also means that the evidence base will require periodic updating.

5. Conclusion

Digital literacy has become an important enabling competence for the development of English language skills among university students. The evidence reviewed here shows that its value extends across critical reading, digital writing, online communication, multimodal listening, speaking practice,

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vocabulary learning, learner autonomy, and online learning capacity. The most important insight is that digital literacy is not simply the ability to use devices; it is the ability to use digital environments critically, strategically, communicatively, ethically, and independently for learning.

For Uzbekistan, the available local evidence is consistent with international research but remains methodologically limited. The next stage should therefore combine curriculum integration with stronger empirical evaluation. English programs can explicitly teach digital information literacy, communication, content creation, and self-regulation while researchers examine how these dimensions predict or support standardized language outcomes. Such an approach would position digital literacy not as an optional technological supplement but as a core component of contemporary university English education.

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