Literacy and Language Learning in the Digital Era

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Abstract

The development of digital technology has transformed the meaning of literacy and the way language is learned and taught. Literacy is no longer limited to the ability to read and write conventional texts but increasingly involves the ability to access, understand, evaluate, create, and communicate meaning through various digital and multimodal resources. This study aimed to describe and analyze the development of literacy and language learning in the digital era, particularly with regard to digital literacy, multimodal literacy, technology integration, learner autonomy, creativity, collaboration, and teacher competence. The study employed a descriptive qualitative approach using a literature study of twenty scholarly articles published between 2015 and 2026. The data were analyzed thematically through the identification, classification, comparison, interpretation, and synthesis of the findings. The results indicate that digital technology has expanded language learning from conventional text-based activities toward multimodal, collaborative, interactive, and personalized learning environments. Digital storytelling, collaborative digital writing, digital games, online resources, and multimodal composing can help learners develop language skills while strengthening digital literacy. Technology integration, however, does not automatically improve learning outcomes; its effectiveness depends on pedagogical design, teacher competence, learners' digital literacy, accessibility, meaningful use, and the ability to evaluate digital information critically. The study concludes that digital literacy should be integrated as an integral component of language learning rather than treated as an additional technical skill. Language education in the digital era therefore requires an integrated approach that combines linguistic competence, digital competence, critical literacy, creativity, collaboration, and responsible participation in digital environments.

Keywords: *digital literacy; language learning; digital technology; multimodal literacy; language education; digital era*

1. INTRODUCTION

The development of digital technology has brought fundamental changes to human life, including the fields of education and language learning. Technology is no longer merely an aid for delivering learning material; it has become part of the environment in which learners read, write, communicate, seek information, build knowledge, and produce various forms of text. This change has caused the concept of literacy to expand in meaning. Literacy no longer relates only to the ability to read and write printed text but also encompasses the ability to access, understand, evaluate, produce, and communicate information through various digital media.

This change in the concept of literacy is especially visible in language learning. Learners today encounter texts that take the form not only of writing but also of video, images, audio, infographics, social media, podcasts, digital games, interactive presentations, and various forms of multimodal text. Jiang and Hafner (2024)

explained that digital multimodal composing has developed into an important practice in second-language learning because the changing landscape of digital communication has altered the way texts are produced and understood. In that context, the ability to write is no longer understood entirely as the activity of producing verbal text but also as the process of designing meaning through the combination of various semiotic resources.

Adam (2026) situated the integration of various digital literacies into the English-language curriculum as a response to the changes in communication in the twenty-first century. Literacy in a digital context develops into an ability that encompasses various forms of communication and meaning-making. Language learning therefore needs not only to develop linguistic ability but also to develop learners' ability to use technology to understand and produce messages.

Hafner et al. (2015) showed that digital literacy is closely related to language learning. In a technology-based learning environment, learners need not only language ability but also the readiness to use various digital devices and resources effectively. Son et al. (2017) showed that learners' digital-literacy needs can differ according to their context, experience, and background; their study of language learners in two different contexts showed that digital-literacy needs and experience are not always the same.

These conditions show that the digitalization of language learning cannot be understood merely as the process of moving conventional learning onto digital devices. Turning a printed book into an electronic document or delivering a lecture through video conference, for example, does not necessarily produce meaningful digital learning. Technology needs to be used to open new pedagogical possibilities, such as collaboration, the production of multimodal texts, interaction with wider audiences, independent learning, the exploration of authentic sources, and the development of creativity.

Elola et al. (2025) showed that collaborative digital multimodal tasks in the learning of Spanish as a second language can provide room for learners to develop language ability together with multiliteracy. Learners can work collaboratively to produce multimodal texts by drawing on various semiotic resources. This practice shows that technology can be used to connect the development of language competence with the development of digital literacy.

On the other hand, the development of technology also presents challenges. The use of technology that is not designed pedagogically can create cognitive load, distraction, gaps in access, dependence on devices, and even technostress. Feng and Liu (2024) showed that digital literacy is related to learners' experience of technostress, online engagement, autonomy, and academic success. This finding shows that the relationship between technology and language learning is complex and cannot be understood only from the side of technology's benefits.

Alakrash and Razak (2021) also showed that the use of digital technology in language learning covers various language skills but that the intensity of its use can differ across skills. This finding shows the need for learning design that deliberately integrates technology into specific linguistic goals.

Another issue relates to teacher competence. The integration of technology in language learning requires teachers to have the ability to select, evaluate, use, and integrate technology into learning activities. Mullen (2025) showed that limitations of knowledge and training can be barriers to the integration of computer-assisted

language learning (CALL). The development of teachers' digital literacy therefore becomes one important aspect of the transformation of language learning.

Iskandar et al. (2022) revealed a similar issue in the context of higher education in Indonesia. Various digital products such as essays, presentations, video, podcasts, and reports have been used in learning; however, the digital literacy required to create such products, the process of making them, and digital ability as a cross-curricular competence have not always been explicitly taught and assessed. Pertiwi (2022) likewise, through a study of university students' perspectives, showed that digital literacy is an important part of English as a foreign language (EFL) learning.

On the basis of these conditions, digital literacy needs to be placed as an integral part of language learning. Language learning in the digital era aims not only for learners to be able to use language correctly but also for them to be able to use language critically, creatively, collaboratively, multimodally, and responsibly within digital environments.

This study aims to describe and analyze the development of literacy and language learning in the digital era on the basis of prior research. Guided by that aim, the study addressed three research questions: (RQ1) How has the concept of literacy in language learning changed in the digital era? (RQ2) How is digital technology used to develop language skills through multimodal and collaborative learning? (RQ3) What are the roles of learner creativity and autonomy and of teacher competence, and what challenges affect the implementation of technology-based language learning?

2. METHOD

Research Design

This study employed a descriptive-narrative qualitative approach using the method of library research. This approach was chosen because the study aimed to understand and describe the development of the concept and practice of literacy and language learning in the digital era on the basis of various published research findings.

Data Sources

The research data came from journal articles provided as the principal sources. This literature was published in the range 2015–2026 and covered studies of digital literacy, technology-based language learning, multimodal learning, digital storytelling, digital games, multilingual learning, collaborative learning, and teachers' digital competence. Twenty sources were used as the basis of the review; they included empirical research, phenomenological studies, systematic reviews, reviews, research agendas, and studies discussing learning practice, a diversity of source types that allowed the study to obtain a broader picture of the phenomenon of literacy and language learning in the digital era.

Data Collection

Data were collected through documentation. Each source was read and identified in terms of several components: the research focus, the learning context, the form of technology use, the type of literacy developed, the role of the learner, the role of the teacher, the benefits for learning, and the constraints on implementation.

Data Analysis

Data were analyzed thematically in several stages. First, the researchers identified the information directly related to the research focus. Second, the

information was grouped into principal themes. Third, findings across sources were compared to identify common patterns and differences. Fourth, the findings were interpreted in a descriptive-narrative form to produce an understanding of the relationship between digital literacy and language learning. The analytic themes comprised: (1) the transformation of the concept of literacy; (2) technology as a language-learning environment; (3) multimodal literacy; (4) digital collaboration; (5) creativity and digital storytelling; (6) digital games; (7) autonomy and the personalization of learning; (8) teacher competence; and (9) the challenges and limitations of digitalizing language learning.

Trustworthiness

The validity of the review was supported through the comparison of sources. Findings emerging from one article were compared with those of other studies with a similar focus, a process used to avoid conclusions based on only a single research result.

Ethical Considerations

Because the study analyzed publicly available scholarly literature and did not involve human participants or personal data, the ethical requirements centred on academic integrity, the accurate representation of sources, and proper attribution.

3. RESULTS

The thematic analysis produced eight interrelated themes that together address the three research questions, as summarized in Table 1. The themes were derived from the reviewed sources and are presented below with their supporting evidence.

Table 1

Themes, Core Focus, and Supporting Sources Derived from the Analysis

Theme	Core focus / analytic codes	RQ	Key supporting sources
Transformation of the concept of literacy	From conventional to digital and multimodal literacy	RQ1	Adam (2026); Jiang & Hafner (2024)
Digital technology as a language-learning environment	Authentic sources, applications, content creation, feedback	RQ2	Alakrash & Razak (2021); Son et al. (2017); Dolzhich et al. (2026)
Multimodal learning	Meaning-making across text, image, audio, and video	RQ2	Jiang & Hafner (2024); Elola et al. (2025)
Digital storytelling and identity	Creativity, personal experience, identity building	RQ2	Kendrick et al. (2022); Anderson et al. (2018)
Collaborative digital learning	Co-writing, participatory culture, audience awareness	RQ2	Elola et al. (2025); Pennington et al. (2024)
Digital games as media for language literacy	Vocabulary, reading, writing; goal-linked use	RQ2	Hanghøj et al. (2022)
Digital literacy, autonomy, and personalization	Learner control; engagement, technostress, adaptation	RQ3	Feng & Liu (2024); Zhang & Yang (2025)
Teachers' digital competence	CALL knowledge, professional development, readiness	RQ3	Mullen (2025); Pennington et al. (2024); Maahs et al. (2025)

Note. RQ = research question; CALL = computer-assisted language learning. The themes and codes were derived from the reviewed scholarly sources.

3.1 Transformation of the Concept of Literacy in Language Learning

The synthesis showed that the concept of literacy in language learning has expanded from conventional literacy toward digital and multimodal literacy. Conventional literacy relates mainly to the ability to read and write verbal text; in a digital environment, learners need to engage with various forms of representation that combine writing, images, sound, video, animation, and interactive elements.

Adam (2026) described this development as the integration of multi-digital literacies into the language curriculum, showing that language learning needs to respond to changes in the way people communicate and make meaning in the twenty-first century. Jiang and Hafner (2024) likewise showed that digital multimodal composing is one important development in second-language learning: learners not only learn to write text but also design text by drawing on various semiotic resources and digital technology. Digital literacy in language learning can thus be understood as a multidimensional ability; learners need to be able to access information, understand messages, evaluate sources, select appropriate media, produce messages, and communicate with regard to context and audience.

3.2 Digital Technology as a Language-Learning Environment

The review showed that digital technology functions not only as a learning aid but also as a learning environment. In a digital environment, learners can access authentic language sources, communicate with other language users, use learning applications, produce content, and obtain feedback. Alakrash and Razak (2021) showed that digital technology is used in the development of various language skills, with variation in its use for vocabulary, reading, and other language practice. Dolzhich et al. (2026) likewise discussed the use of digital tools in language teaching and their connection with digital literacy.

Son et al. (2017) added that language learners' use of technology is influenced by their experience and learning context; two groups of learners in the Australian and Japanese contexts showed different digital-literacy needs and expectations. There is therefore no single pattern of technology use that can be applied uniformly to all learners, and learning design needs to consider learners' characteristics, experience, digital ability, and language needs.

3.3 Multimodal Learning

One of the most prominent developments is the shift from monomodal, text-based learning toward multimodal learning. Multimodal learning allows learners to use more than one form of representation to make meaning; for example, learners may write a text and then turn it into a video, infographic, podcast, digital presentation, or digital story.

Jiang and Hafner (2024) identified a number of research agendas in digital multimodal composing, including the development of writing skills, task design, teacher education, feedback practice, assessment, collaboration, and critical digital literacy. Elola et al. (2025) provided an empirical example of how monomodal text can be developed into multimodal text through collaborative tasks in Spanish-language learning, in which learners worked online and developed multimodal texts by drawing on various semiotic resources; the results showed positive perceptions of language development, motivation, and multiliteracy. Multimodal learning can thus become a means of integrating language ability with digital ability.

3.4 Digital Storytelling and the Development of Identity

Digital storytelling is one learning practice that connects language, technology, creativity, and learners' personal experience. Kendrick et al. (2022) showed that digital storytelling can be a space for learners from refugee backgrounds to develop

language and digital literacy, revealing various possibilities for using multimodal meaning to convey complex ideas, develop digital literacy, and build identity in language learning. Anderson et al. (2018), through a multilingual digital-storytelling project, likewise showed that creative and critical approaches to language learning can be developed through digital technology.

These findings show that language learning can become more meaningful when learners have the opportunity to connect language with their life experience. In this context, technology is not the goal of learning but a medium that enables learners to express ideas and identity, so that language learning becomes not only a matter of mastering structure and vocabulary but also the ability to use language to build meaning and participate in social life.

3.5 Collaborative Digital Learning

The review showed that digital technology broadens the possibilities for collaborative learning. Digital platforms allow learners to write, edit, comment, discuss, and produce work together. Elola et al. (2025) showed that collaborative digital multimodal tasks allow learners to work together in producing text and to build awareness of audience.

Pennington et al. (2024) also showed that technology in language learning can create a participatory culture, increase opportunities for expression, support learner interaction, and support learning autonomy, and pointed to the importance of developing new media literacies in the learning of multilingual learners. Digital learning can thus shift learners from consumers of information to producers of knowledge and text.

3.6 Digital Games as Media for Language Literacy

Digital games are another form of learning environment that can be used in language learning. Hanghøj et al. (2022), through a comparative review of the use of digital games in first-language (L1) and second-language (L2) contexts, showed that research in L1 contexts found benefits related mainly to writing, multimodal production, and critical literacy, while in L2 contexts research showed the potential of educational games in developing vocabulary, reading, and writing.

These findings show that digital games can be a context for using language meaningfully. However, the use of games still needs to be connected with learning goals; games used without a clear linguistic goal do not necessarily produce the development of language ability.

3.7 Digital Literacy, Autonomy, and Personalization

Digital technology allows learners to have greater control over their learning process: they can select sources, determine study time, repeat material, use particular applications, and obtain material suited to their needs. Feng and Liu (2024) showed a relationship among digital literacy, online engagement, autonomy, technostress, and academic success, indicating that digital ability plays a part in determining how learners interact with the digital learning environment.

Zhang and Yang (2025) also found a positive relationship between digital literacy and language proficiency, engagement, motivation, the ability to adapt to personalized learning technology, and communication strategies. Because that study used a quantitative approach, however, its results need to be understood as a statistical relationship in the research sample rather than as evidence that technology automatically causes an improvement in language ability.

3.8 Teachers' Digital Competence

Teachers hold an important position in determining the quality of technology use. Mullen (2025) showed that limitations of CALL knowledge and training can be a barrier for teachers in integrating technology meaningfully, but that the development of CALL literacy can help prospective teachers improve their ability to find and evaluate digital sources. Pennington et al. (2024) likewise emphasized the importance of teachers' professional development for integrating digital technology and new media literacies in the learning of multilingual learners. Maahs et al. (2025), drawing on the insights of teachers of adult migrant learners, similarly showed that the use of digital technology in language learning is shaped by teachers' understanding and readiness.

These findings show that digital transformation in language learning needs to be accompanied by a transformation of teacher competence. It is not enough for teachers to be able to operate technological devices; they also need to understand when technology is used, for what purpose, how learners use it, and how learning outcomes are assessed.

4. DISCUSSION

The review showed that digital literacy should not be positioned as an additional skill outside language learning; rather, it needs to be integrated into the language-learning process. Iskandar et al. (2022) provided a relevant illustration in the context of Indonesian higher education: although various digital products such as video, podcasts, presentations, and reports have been used, the digital ability required to produce them has not always been an explicit part of learning goals and assessment. This shows a difference between using technology and learning through technology. Using technology means that learners employ digital devices to complete tasks; learning through technology means that learners simultaneously develop the competence to seek, evaluate, process, create, and communicate information digitally. This difference is important, because if teachers use technology only as a medium for delivering material, the potential of technology to develop digital literacy is not yet fully realized.

Language learning in the digital era needs to move from a pattern of consuming information toward producing information. Learners not only read digital articles, watch video, or listen to podcasts; they also need to be given the opportunity to create their own digital texts—digital articles, blogs, podcasts, video, infographics, presentations, digital stories, reviews, digital posters, or multimedia projects. In this process, language ability remains central: learners must consider language structure, word choice, the organization of ideas, cohesion, coherence, and appropriateness to audience, while at the same time considering visual design, the selection of images and audio, information sources, copyright, and digital ethics. The production of digital text can thus become a space for integrating language competence and digital competence.

The skills of reading, writing, speaking, and listening in a digital environment also change. Reading is not only reading writing but understanding the relationship among text, image, video, sound, and layout; writing is not only producing paragraphs but can involve the process of designing multimodal text; speaking takes place not only in face-to-face communication but also through video, online conferencing, podcasts, and social media; and listening is not only listening to the teacher but also understanding video, podcasts, digital presentations, and multimedia communication. Language learning in the digital era therefore needs to

consider receptive and productive skills together with the ability to integrate various modalities. Jiang and Hafner (2024) placed digital multimodal composing as a field requiring attention to task design, feedback, assessment, teacher education, collaboration, and critical digital literacy.

Digital technology also opens room for creativity. Juliantari (2026) placed digital literacy and creativity as part of language learning in higher education. Creativity in language learning can be realized through the choice of topic, the construction of stories, visual design, the production of video and podcasts, and other forms of digital communication. Creativity, however, does not mean merely producing a visually attractive product; digital products must still have linguistic quality, a structure of ideas, relevance of content, and credibility of sources, so that creativity in digital language learning needs to be combined with information literacy and critical literacy. Seferović (2025) similarly discussed effective tools for promoting digital literacy and language learning.

Ease of access to information does not always mean that all available information can be trusted. Learners need the ability to evaluate sources, compare information, recognize bias, understand context, check the credibility of authors, and distinguish fact from opinion. Cummins (2024) showed that the development of technology does not automatically produce an improvement in the quality of education; technology needs to be placed within a pedagogical framework and a school environment that supports the development of literacy. When learners use the internet as a source for language learning, they need to be taught how to evaluate the quality of digital sources, so that digital literacy has a critical and not merely a technical dimension.

The use of technology can also create new problems. Feng and Liu (2024) showed that learners can experience technostress in a digital learning environment, indicating that the use of more technology does not always mean a better learning experience. Learners may face difficulty because of too many platforms, unclear instructions, information overload, an unstable internet connection, limited devices, or a lack of digital skills. The digitalization of language learning therefore needs to attend to the principles of simplicity, accessibility, and meaningfulness; teachers need not use as many applications as possible, and it is more important to select technology that genuinely supports the learning goals.

In digital learning, the teacher does not lose their role; rather, the role changes. Teachers become not only sources of information but designers of learning experiences, facilitators of technology use, mediators of information, guides of digital literacy, providers of feedback, directors of critical learning, and evaluators of learners' digital products. Mullen (2025) showed that the development of teachers' digital literacy through CALL intervention can improve teachers' ability to find and evaluate sources, and Pennington et al. (2024) showed the importance of teachers' professional development in using technology for the learning of multilingual learners. Investment in teachers' digital literacy is therefore an important part of the transformation of language learning.

On the basis of the synthesis of the various sources, the implementation of digital literacy in language learning can be developed through the following stages: identifying the language goal, selecting technology, exploring digital sources, analyzing information, producing multimodal text, collaboration and feedback, publication or presentation, and reflection and assessment. The first stage is determining the language goal—the language skill the teacher wishes to develop. The second is selecting appropriate technology, chosen on the basis of pedagogical

need rather than the popularity of the application. The third is the exploration of digital sources, in which learners search for and read various sources. The fourth is analysis, in which learners evaluate information, sources, language, and mode of presentation. The fifth is production, in which learners create digital or multimodal text. The sixth is collaboration and feedback, in which learners comment on their peers' work. The seventh is publication or presentation. The last is reflection and assessment, in which the teacher assesses not only language ability but also the process and the digital-literacy competence developed. This model shows that technology should be integrated into the whole learning process rather than used only at the stage of delivering material.

In the Indonesian context, the integration of digital literacy carries several important implications.

Digital literacy as an integrated competence. The curriculum for language learning needs to include digital literacy as a competence integrated with language skills rather than taught in isolation.

Pedagogical, not merely technical, teacher training. Teachers need training that is not only technical but also pedagogical, so that they understand how technology is used to achieve learning goals.

Proportional access to devices and resources. Schools need to provide access to digital devices and resources in a proportional way.

Assessment of process, not only product. Assessment needs to be developed to evaluate not only the final product but also the process of seeking information, the ability to evaluate sources, creativity, collaboration, and effective language use.

Learners as producers of digital content. Learning needs to give learners room to become producers of digital content rather than only consumers.

Critical literacy. Critical literacy needs to be an important part of learning; learners need the ability to distinguish credible from non-credible information and to understand the ethics of digital communication.

Limitations and Suggestions. This study was based on a qualitative synthesis of the analyzed literature rather than on primary fieldwork; its findings therefore reflect the reviewed sources and are not derived from direct observation. Future research could extend the study through fieldwork in schools or universities in Indonesia to examine empirically how digital literacy is integrated into the learning of Indonesian and foreign languages, including teachers' strategies, learners' experience, forms of assessment, and gaps in access to technology.

5. CONCLUSION

Literacy and language learning in the digital era have undergone significant change. Literacy is no longer limited to the ability to read and write conventional text but has developed into the ability to use various sources, media, technologies, and modalities to understand and produce meaning. The review showed that digital technology can broaden the language-learning environment through multimodal learning, digital storytelling, collaborative writing, digital games, authentic sources, online learning, and technology that supports personalization. Various studies show the potential of technology to support language skills, motivation, autonomy, creativity, collaboration, and the development of digital literacy.

Technology, however, does not automatically produce more effective language learning. The meaningfulness of technology use depends heavily on pedagogical design, teachers' digital competence, learners' readiness, the quality of sources,

access to technology, and the ability to use technology critically and responsibly. Language learning in the digital era therefore needs to move from the mere use of technology toward the integration of digital literacy into the pedagogical process. Learners need the opportunity not only to consume digital information but also to seek, evaluate, process, create, and communicate information through various forms of text.

Teachers have an important role as designers and mediators of learning. The development of teachers' competence in digital literacy and CALL is an important part of ensuring that technology is used not merely as an additional device but as a means of creating meaningful language-learning experiences. The direction of language learning in the digital era can thus be formulated as the integration of linguistic competence, digital literacy, multimodal literacy, critical literacy, creativity, collaboration, and learning autonomy.

This approach allows language learning not only to prepare learners to master language but also to participate productively and critically in digital communication environments. Future research can extend the study through fieldwork in schools or universities in Indonesia to observe empirically how digital literacy is integrated into the learning of Indonesian and foreign languages, including teachers' strategies, learners' experience, forms of assessment, and gaps in access to technology.

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The authors declare that they have no conflict of interest related to the research, authorship, or publication of this article.

Data Availability.

This study analyzed publicly available published literature; no new empirical data were generated, and all sources analyzed are listed in the References.

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