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Integrating SDG-Themed Digital Authentic Texts in Communicative Language Teaching for Developing Students' Digital Literacy

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Abstract

As higher education increasingly prioritizes digital competence, pedagogical models must move beyond tool integration toward design-driven digital literacy development. This study examines how embedding Sustainable Development Goal (SDG)-themed digital authentic texts within a Communicative Language Teaching (CLT) framework facilitates digital competence in a technology-enhanced university classroom. Accordingly, this study was conducted to find How does the integration of SDG-themed digital authentic texts within a CLT framework facilitate the development of undergraduate students' digital literacy. Using a descriptive qualitative design, the study was conducted over a ten-week instructional intervention involving 28 undergraduate English Language Education students. Data were generated from classroom observations, multimodal digital works, reflective journals, and semi-structured interviews. The analysis was informed by digital competence dimensions framed by UNESCO. Findings show that SDGs functioned as epistemic and ethical substance, intensifying students' critical engagement with multimodal digital texts. Through structured cycles of exposure, analysis, production, and reflection, students demonstrated progressive development in organized information evaluation, multimodal meaning-making, ethical digital participation, and digitally mediated communicative competence. The study developments an SDG-Embedded Techno-Pedagogical Mediation Model, arguing that digital literacy development arises from the meeting of global sustainability discourse, multimodal digital works, and communicative instructional instruments. By highlighting contextual relevance and pedagogical design as primary drivers of digital competence, this study contributes a design-oriented framework to technology-enhanced learning research.

Keywords: *SDGs; CLT; Digital Authentic Text; Multimodality; Literacy Digital.*

INTRODUCTION

The integration of digital tools has completely transformed how people think about knowledge and teaching in higher education. Students are no longer just being the customers of printed texts but they pass through complex multimodal environments categorized by powered by smart tech, information flows, user of the generated content, and international digital sources. Thus, literacy in the 21st century has totally changed. It's no longer confined to use only basic reading and writing, but also about determining online sources critically, responsibly online, and mastering diverse ways of communicating. In this era, digital literacy isn't just an advantage because it has

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become a foundational skill for academic success, community involvement, and long-term career growth. (Hammoda & Foli, 2024)

International Accord have emphasized the urgency of strengthening digital literacy across educational sectors. According to UNESCO (2018), Media and Information Literacy as a multipart of critical thinking, verify data ability, and responsible media involvement. Likewise, the European Commission's (2017) DigComp framework defines digital competence through five core areas: data literacy, communication, content creation, safety, and problem-solving. These frameworks collectively emphasize that digital literacy is not only technical proficiency but includes the higher order cognitive and the dimension of socio ethical. Later studies backed this up, showing that digital literacy significantly predicts learning outcomes and advanced technological competencies (Puniatmaja et al., 2024; Vosoughmatin, 2025).

Within the context of English Language Teaching (ELT), these developments pretense some significant pedagogical implications. Communicative Language Teaching (CLT), which draws the focus toward communicative competence by making meaningful engagement and authentic communication the absolute canter of the language acquisition process (Santos, 2020). Theoretically, CLT should be appropriate approach for digital literacy because it emphasizes on how learners Clarifying misunderstandings, discourse organization, and observe sociolinguistic appropriateness. Yet, a massive gap exists when it actually hits the classroom. In many higher education settings, CLT is still bogged down by traditional textbooks and a strict focus on grammar, completely missing the more critical, multimodal sides of how students engage online today.

This shift also broadens the role of learners in contemporary education. Alongside the growing emphasis on digital literacy, global citizenship education has emerged as an important educational agenda. Central to this agenda are the Sustainable Development Goals (SDGs), introduced by the United Nations (2015) to address global challenges such as climate change, social justice, gender equality, and quality education. Integrating SDG themes into language learning enables students to develop language skills while engaging with authentic real-world issues, thereby fostering critical awareness, intercultural competence, and reflective thinking. However, although SDGs have received considerable attention in curriculum studies, their systematic integration into communicative language teaching through digital authentic texts remains underexplored.

Digital authentic texts; such as online news articles, social media campaigns, interactive infographics, podcasts, and documentary videos represent real-world communicative artifacts embedded within sociocultural and political discourses. Unlike conventional pedagogical texts, digital authentic materials are multimodal, dynamic, and situated within broader digital ecologies. Research suggests that effective digital text integration requires explicit instructional modelling and strategic pedagogical design rather than mere technological inclusion (Christ et al., 2023; Green, 2025). Furthermore, students often require scaffolding to navigate digital reading environments critically and analytically (Hargreaves et al., 2022). Similar findings found that students' engagement with multimodal resources enhanced their ability to construct meaning across textual, visual, and digital modes, highlighting the growing importance of multimodal literacy in contemporary language education (Rahmah & Fitriyana, 2024).

Despite the growing body of research on digital literacy in higher education, several important gaps remain. Previous studies consistently report that digital literacy contributes positively to students' learning outcomes, technological competence, and emerging digital capabilities (Joseph et al., 2024; Sariyatun et al., 2025). Recent studies further emphasize that digital literacy is closely associated with students' ability to critically evaluate online information, engage responsibly in digital environments, and adapt to emerging technological challenges in higher education (Georgopoulou et al., 2025; Kayyali, 2024). However, most studies view digital literacy primarily as a measurable outcome and focus on students' skills, readiness, or technology use. As a result, less attention has

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been given to how digital literacy develops through instructional processes and communicative engagement with authentic digital texts. Moreover, while digital authentic materials are increasingly used in language learning, few studies have examined how SDG-themed content can promote critical evaluation, ethical awareness, digital communication, and collaborative meaning-making simultaneously. Existing research also tends to treat digital literacy as separate competencies rather than as capabilities developed through integrated communicative activities involving multimodal texts and real-world issues. Therefore, further process-oriented research is needed to explain how digital literacy develops in technology-enhanced language classrooms.

Theoretically, the present study positions digital literacy, Communicative Language Teaching (CLT), SDGs, and multimodality as interconnected constructs. Digital literacy is conceptualized as the primary educational outcome, encompassing learners' abilities to evaluate information critically, communicate effectively, create digital content, and participate responsibly in digital environments. Within this framework, CLT functions as the pedagogical mechanism through which students negotiate meaning, engage in authentic communication, and collaboratively construct knowledge. Multimodality provides the semiotic environment for this process, as contemporary digital authentic texts integrate linguistic, visual, auditory, and spatial modes that require learners to interpret and produce meaning across multiple representational forms. Recent studies have demonstrated that engagement with multimodal digital texts enhances students' critical thinking, collaborative meaning-making, and digital literacy development by encouraging learners to navigate and integrate multiple semiotic resources simultaneously (Shimizu et al., 2025; Wang, 2025). These findings reinforce the role of multimodality as a key mechanism through which digital literacy competencies are developed in technology-enhanced learning environments.

SDG-themed digital authentic texts are therefore pedagogically distinct from other forms of digital learning materials because they combine multimodal complexity with socially meaningful content. Recent scholarship has increasingly highlighted the importance of connecting digital competence development with sustainability-oriented and inclusive educational practices, particularly in relation to SDG 4 and global citizenship education (Sholeh et al., 2026). Similarly, studies on digital education and sustainability have argued that digital literacy frameworks are most effective when situated within authentic social contexts that encourage ethical participation and civic engagement rather than merely technical skill acquisition (Sarkar et al., 2025). Different generic digital texts that primarily support language practice or information delivery, SDG-related materials expose learners to authentic global challenges such as climate change, quality education, social inequality, and sustainability.

Consequently, students are required not only to comprehend information but also to evaluate data credibility, recognize competing perspectives, negotiate meaning collaboratively, and reflect on the ethical implications of digital communication. Building on this conceptual relationship, the present study investigates how the integration of SDG-themed digital authentic texts within a Communicative Language Teaching framework facilitates the development of undergraduate students' digital literacy in an English Language Education program. Unlike existing digital literacy frameworks such as UNESCO's Media and Information Literacy framework and the European Commission's DigComp framework, which primarily categorize digital competence into domains, indicators, or competency dimensions, this study proposes an SDG-Embedded Techno-Pedagogical Mediation Model that emphasizes the pedagogical processes through which digital literacy develops. The proposed model conceptualizes digital competence as emerging from the interaction among global sustainability discourse, multimodal digital authentic texts, and communicative instructional design. Rather than focusing solely on the outcomes of digital literacy, the model highlights the instructional mechanisms that mediate students' critical evaluation, multimodal meaning-making, ethical participation, and digitally mediated communication. Guided by the identified theoretical and

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pedagogical gaps, this study addresses the following research question: How does the integration of SDG-themed digital authentic texts within a Communicative Language Teaching (CLT) framework facilitate the development of undergraduate students' digital literacy? So, the objective of this study is to explore how SDG-themed digital authentic texts mediate students' development of information evaluation skills, multimodal meaning-making abilities, ethical digital participation, and digitally mediated communicative competence within a technology-enhanced higher education environment.

METHOD

This study employed a descriptive qualitative research design to investigate how the integration of SDG-themed digital authentic texts within a Communicative Language Teaching (CLT) framework mediated the development of students' digital literacy in a technology-enhanced higher education context. The study is theoretically positioned within the discourse of technology-enhanced learning that conceptualizes digital competence as a situated, socially mediated, and design-dependent construct. Moving beyond tool-centric perspectives, this research aligns with sociocultural and constructivist views that understand learning as emerging through interaction with digitally mediated artifacts and collaborative knowledge construction. Within this framework, instructional design functions as a mediating structure that shapes learners' cognitive engagement and ethical participation in digital environments. By embedding SDG-themed multimodal authentic texts into communicative tasks, this study conceptualizes CLT as a techno-pedagogical ecology that structures exposure, analysis, production, and reflection. Therefore, the study positions pedagogical design, rather than technology alone, as a central driver of digital competence development.

The research was conducted in the English Language Education Study Program, Faculty of Teacher Training and Education, Universitas Islam Kadiri, Kediri. The participants in this study were 28 third-year undergraduate students enrolled in a technology-enhanced speaking course. Their ages ranged from 19 to 22 years old. The class member consisted of 19 female students and 9 male students. Based on departmental placement records and course achievement data, the participants demonstrated an intermediate level of English proficiency, approximately corresponding to the B1–B2 levels of the Common European Framework of Reference (CEFR). Purposive sampling was employed to ensure that all participants had regular access to digital devices, stable internet connectivity, and prior experience using learning management systems and online learning platforms. The instructional intervention was conducted over ten weeks and aimed to integrate communicative pedagogy with digital competence development. The instructional design was guided by digital literacy dimensions framed by UNESCO, particularly those related to information evaluation, communication and collaboration, digital content creation, and ethical participation. Digital authentic materials were selected based on their relevance, multimodal characteristics, and alignment with selected Sustainable Development Goals (SDGs). The materials included online news articles, interactive infographics, short documentary videos, social media campaigns, and reports from non-governmental organization websites.

Each instructional cycle followed these stages: 1) Guided Digital Exposure: Students engaged with SDG-themed multimodal texts through guided digital activities; 2) Critical Analysis: Students evaluated source credibility, identified and analysed multimodal elements, and interpreted representational strategies; 3) Collaborative Production: Students collaboratively created digital responses in the form of video presentations, digital campaigns, and interactive slide-based advocacy projects; and Reflective Writing: Students wrote reflective responses explaining their evaluative reasoning, digital decision-making processes, and ethical considerations. This sequence was designed to foster higher-order digital competence within a communicative and technology-mediated learning environment. Tabel 1 presents the mapping of pedagogical stages to targeted digital literacy outcomes,

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illustrating the systematic alignment between instructional design and the digital competence dimensions addressed in this study.

Table 1. Pedagogical Mapping to Literacy Outcomes

Instructional Stage	Pedagogical Focus	Digital Competence Dimension	Intended Learning Outcome
Digital Exposure	Critical Engagement with SDG-themed multimodal texts	Information and data literacy	Ability to identify key information, distinguish fact from opinion, and recognize source characteristics
Critical Analysis Task	Evaluation of credibility, bias, and multimodal representation	Critical evaluation and ethical awareness	Ability to assess reliability, detect bias, and interpret multimodal meaning
Communicative Production Task	Collaborative creation of multimodal digital works	Digital content creation and communication	Ability to produce multimodal digital works and communicate ideas responsibly
Reflective Engagement	Metacognitive reflection on digital practices	Digital responsibility and problem-solving	Ability to articulate evaluative reasoning, ethical considerations, and digital decision-making strategies

Data were collected through the following techniques: 1) Classroom observations were conducted during each instructional session, with field notes documenting interaction patterns, evaluative discourse, and students' multimodal engagement; 2) Analysis of students' digital works, including videos, presentations, and digitals posters, was undertaken to assess their digitally mediated communicative competence; 3) Weekly reflective journals were utilized to examine the development of students' metacognitive awareness and evaluative reasoning; and 4) Semi-structured interviews were conducted with 8 purposively selected participants to explore their experiences concerning digital challenges, interpretive strategies, and collaborative learning processes; all interviews were audio-recorded and transcribed. An interview guideline was developed to ensure consistency across interview sessions. The protocol consisted of open-ended questions focusing on four key areas: (1) students' strategies for evaluating the credibility and reliability of digital information, (2) their experiences in interpreting multimodal digital texts, (3) their perceptions of ethical issues encountered during digital communication and content creation, and (4) their reflections on collaborative learning and communicative interaction throughout the instructional intervention. Follow-up probing questions were used to clarify responses and gain deeper insights into students' reasoning, decision-making, and learning experiences.

Data were analyzed using the interactive model of qualitative data analysis proposed by Miles, Huberman, comprising four concurrent and iterative stages: data collection, data reduction, data presentation/display, and conclusion drawing and verification. Data collection involved the systematic collection of information through classroom observations, reflective journals, students' digital works, and semi-structured interviews. Data reduction involved the selection, focusing, and transformation of raw data through coding and categorization, guided by predefined digital literacy dimensions including information evaluation, multimodal meaning-making, ethical digital awareness, and online communicative competence. Data display or presentation was conducted through the organization of condensed information into structured narratives and thematic patterns to facilitate systematic

interpretation. Conclusion drawing and verification were undertaken through iterative reflection on emerging patterns, with conclusions progressively refined as additional data were incorporated. To establish trustworthiness, source triangulation was conducted by comparing findings across all data sources. Member checking and peer discussion were additionally employed to strengthen the credibility and dependability of the interpretations.

The coding process was conducted through several iterative stages. First, all observation notes, interview transcripts, reflective journals, and digital artifacts were read repeatedly to obtain a comprehensive understanding of the dataset. Second, meaningful segments of data were assigned initial codes related to students' information evaluation practices, multimodal meaning-making processes, ethical digital awareness, and digitally mediated communicative engagement. Third, similar codes were grouped into broader categories to identify recurring patterns within and across data sources. Finally, categories were refined into higher-order themes that represented the developmental dimensions of students' digital literacy throughout the intervention. Although the analysis was informed by predetermined digital literacy dimensions derived from UNESCO's framework, the theme development process remained iterative and data-driven. Themes were generated through continuous comparison across observation records, interview transcripts, reflective journals, and students' digital products.

RESULT

The findings indicate that the integration of SDG-themed digital authentic texts within a communicative, technology-enhanced instructional design facilitated multidimensional digital literacy development. The Sustainable Development Goals (SDGs) did not merely function as thematic content but operated as epistemic, ethical, and rhetorical mechanisms that systematically deepened students' critical engagement with digital environments, thus extending beyond conventional content integration and reflecting the generative potential of sustainability-oriented pedagogy.

Deepening Epistemic of Information Evaluation

At the beginning of the intervention, many students evaluated online information using surface-level indicators such as website appearance and perceived authority. Classroom observations during the first two weeks revealed that students frequently selected sources based on visual attractiveness rather than evidence of credibility. One observation was noted and documented:

> "*Several students stated that a website was trustworthy because it looked professional and appeared at the top of the search results, without checking the author, publication date, or supporting references."* (Observation Note, Week 2)

As students engaged with SDG-themed materials containing conflicting claims and statistical information, their evaluative practices became more systematic. Reflective journal entries indicated increased attention to source verification and evidence comparison. For example, one student wrote:

> "*I realized that not all websites discussing climate change provide reliable information. I started comparing data from different sources and checking who published the information before using it in my project*." (Reflective Journal, Student 12)

Interview data further confirmed this development. One participant explained:

> "*Before this course, I usually believed information if many people shared it. Now I try to check*

where the data comes from and whether other websites report the same thing." (Interview, Participant 4).

These findings suggest a shift from intuitive information acceptance toward intentional and evidence-based evaluation practices, reflecting growth in the information and data literacy dimension of digital competence.

Developing Multimodal Meaning-Making within Global Sustainability Discourse

Initial observations indicated that students primarily focused on written information while paying limited attention to visual and auditory elements embedded in digital texts. During early classroom discussions, students frequently summarized textual content without commenting on the communicative function of images, color schemes, or infographic design. However, engagement with SDG-themed multimodal materials gradually increased students' awareness of multiple meaning-making resources. One student reflected:

"*I used to read only the text in an infographic. Now I understand that colors, pictures, and data visualization can influence how people interpret the message*." (Reflective Journal, Student 7)

This development became visible in students' digital projects. In a group advocacy campaign on SDG 13 (Climate Action), students intentionally used contrasting color palettes, statistical charts, and visual narratives to strengthen their persuasive message. One project included the statement:

"*Climate change is not a future problem. The increase in global temperature is visible today, affecting communities worldwide*."

The statement was accompanied by comparative temperature graphs and contextual images illustrating environmental impacts. Interview responses also reflected increased multimodal awareness. One participant stated:

"*When creating our digital campaign, we discussed not only what to say but also which images and colors would make our message stronger*." (Interview, Participant 6)

These findings indicate that students increasingly viewed communication as a multimodal process rather than a purely linguistic activity

Practicing Ethical Digital Participation Trough Sustainability Narratives

A significant transformation was observed in students' ethical reasoning throughout the instructional intervention. During the initial stages of the course, observation notes indicated that students paid limited attention to issues of source attribution, copyright, and representational ethics when using digital materials. In several early assignments, students copied visual content from online sources without providing attribution and rarely questioned the ethical implications of digital dissemination. As students engaged with SDG-related issues such as social inequality, poverty, and environmental sustainability, they began to demonstrate greater awareness of ethical responsibilities in digital communication. Reflective journal entries revealed increasing concern regarding the accuracy, credibility, and ethical use of digital information. One student wrote:

"*I used to think that taking pictures from the internet was normal as long as they fit my presentation. After this project, I learned that I need to acknowledge the source and consider*

whether the image represents people fairly." (Reflective Journal, Student 15)

Similarly, interview data suggested that students became more conscious of how digital content may influence public perceptions. One participant explained:

"*When we created our campaign about poverty, we discussed whether the pictures could make people look weak or helpless. We wanted to share information without creating negative stereotypes*." (Interview, Participant 2)

Evidence from students' digital advocacy projects further supported this development. Several groups included image attributions, source references, and evidence-based claims in their final projects, demonstrating increased awareness of responsible digital content creation. An observation was noted documented that students frequently discussed source credibility and ethical representation during collaborative project development:

"*Students debated whether a particular image should be included because it might reinforce stereotypes about disadvantaged communities*." (Observation Note, Week 8)

These findings suggest that sustainability-oriented communicative tasks encouraged students to move beyond technical digital participation toward more responsible and ethically informed practices. The SDGs functioned not only as thematic content but also as a moral framework that fostered critical reflection on digital citizenship, representation, and social responsibility.

Reconceptualizing Communicative Competence in Digitally Mediated Contexts

The instructional integration of SDG-themed digital authentic texts also contributed to a broader understanding of communicative competence among students. At the beginning of the intervention, classroom discussions revealed that many students associated communicative competence primarily with grammatical accuracy, vocabulary mastery, and oral fluency. Observation records indicated that students initially evaluated successful communication in terms of language correctness rather than audience impact or message effectiveness. As students participated in collaborative multimodal projects, however, their understanding of communication expanded considerably. They became increasingly aware that effective communication in digital environments requires the integration of linguistic, visual, informational, and ethical considerations. Reflecting on this experience, one student wrote:

"I *learned that communication is not only about speaking English correctly. It is also about making sure that people understand the message and trust the information we provide.*" (Reflective Journal, Student 9)

Interview data further highlighted this shift. One participant stated:

"*Before, I focused mostly on grammar. During the campaign project, our group had to think about the audience, the visual design, the evidence we used, and how the message could influence other people.*" (Interview, Participant 8)

This transformation was also visible in students' final digital projects. For example, one group developing a campaign on climate action combined statistical evidence, narrative explanations, visual infographics, and persuasive calls for action. The project included the statement:

"*Climate change is not a future issue; it is a global challenge that requires collective action today*."

The statement was accompanied by comparative data visualizations and carefully selected imagery intended to enhance audience engagement and message clarity. Classroom observations additionally documented increased collaborative negotiation during project development:

"*Students repeatedly revised their presentations, discussing how visual design, supporting evidence, and audience needs could improve the effectiveness of their communication*." (Observation Note, Week 10)

These findings indicate that students gradually reconceptualized communicative competence as a multidimensional construct encompassing audience awareness, multimodal design, collaborative decision-making, evidence-based argumentation, and ethical responsibility. Such developments suggest that communicative competence in digitally mediated contexts extends beyond linguistic proficiency and increasingly involves the ability to communicate meaning effectively across multiple modes and platforms

DISCUSSION

The findings of this study reinforce and extend existing scholarship on digital literacy development, multimodal meaning-making, and communicative competence in technology-enhanced learning environments. Across all four identified dimensions, SDG-themed digital authentic texts functioned not merely as instructional content but as pedagogical mediators that shaped students' cognitive engagement, ethical reasoning, and communicative practices. Such findings support the view that digital competence is a multidimensional construct encompassing evaluative, collaborative, and socio-ethical capabilities beyond technical proficiency alone (Hammoda & Foli, 2024; Nagari & Hussin, 2023). More importantly, the findings suggest that digital literacy develops most effectively when meaningful content, communicative interaction, and multimodal engagement are strategically integrated within pedagogical design

A particularly significant finding concerns the emergence of students' information evaluation practices. While previous research has established a positive relationship between digital literacy and academic performance (Puniatmaja et al., 2024; Vosoughmatin, 2025), the present study provides insight into the mechanisms through which such literacy develops. The findings indicate that SDG themes generated what may be described as epistemic tension, a condition in which learners encountered competing viewpoints, conflicting data sources, and complex global issues without immediately obvious solutions. Sustainability topics such as climate change, social inequality, and quality education are inherently multidimensional and frequently contested within digital media environments. Consequently, students were compelled to question source credibility, compare perspectives, and justify evaluative decisions rather than accept information at face value. This process aligns with UNESCO's conception of digital literacy as critical engagement with information and supports arguments that higher-order digital competence emerges through cognitively demanding learning experiences rather than through technology exposure alone (Hammoda & Foli, 2024; Nagari & Hussin, 2023).

The findings also demonstrate the important role of multimodal digital texts in fostering digital competence. Previous studies have reported that students often experience difficulties when navigating contemporary digital reading environments because information is distributed across linguistic, visual, auditory, and interactive modes (Hargreaves et al., 2022). The present findings

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suggest that multimodal texts influence digital competence because they require learners to engage simultaneously in interpretation, evaluation, and representation. Students were not only required to understand information but also to examine how meaning was constructed through color, imagery, layout, narrative sequencing, and data visualization. This process encouraged learners to move beyond linear textual comprehension toward multimodal design thinking. Such findings support research highlighting the role of multimodal engagement in developing hybrid digital competencies and digital content creation skills (Christ et al., 2023; Moundy et al., 2025). Multimodality therefore functioned not simply as a characteristic of digital texts but as a mechanism that facilitated deeper meaning-making and digital literacy development.

Another important contribution of this study concerns the relationship between sustainability discourse and ethical digital participation. The findings indicate that SDGs served as a moral and social framework through which students reflected on issues of representation, attribution, credibility, and digital responsibility. Unlike generic digital learning materials, SDG-related content exposed students to authentic societal challenges involving vulnerable communities, environmental concerns, and social justice issues. Such engagement encouraged learners to consider the consequences of digital communication and content production. This interpretation is consistent with studies emphasizing the socio-cognitive and ethical dimensions of digital literacy (Dang Lam Ngoc & Li Chong, 2023; Jingrui et al., 2025; Sariyatun et al., 2025). The findings therefore suggest that ethical digital awareness is strengthened when digital literacy activities are situated within meaningful social contexts rather than decontextualized technological tasks.

The transformation of communicative competence observed in this study further extends contemporary interpretations of Communicative Language Teaching (CLT). Traditionally, communicative competence has been associated with linguistic accuracy, discourse management, and sociolinguistic appropriateness (Santos, 2020). However, the findings suggest that communication in digitally mediated environments increasingly requires multimodal composition, evidence-based argumentation, audience awareness, and ethical responsibility. Students' digital projects demonstrate that effective communication involves the strategic integration of language, visual resources, and credible information. This finding supports contemporary perspectives that view CLT as a broader pedagogical ecology capable of supporting not only language development but also critical digital engagement. Consequently, communicative competence in the twenty-first century should be understood as an inherently multimodal and digitally situated construct.

The findings also have important implications for language teachers. First, technology integration alone appears insufficient for developing digital literacy. Teachers should design learning experiences that require students to interrogate information, evaluate digital sources, negotiate meaning collaboratively, and reflect critically on digital practices. Second, the findings suggest that globally relevant themes such as SDGs can provide meaningful contexts that motivate deeper engagement with digital texts. Rather than treating digital literacy as a separate set of technical skills, language teachers may embed digital competence objectives within communicative tasks involving authentic social issues. Through such integration, language learning can simultaneously support linguistic proficiency, critical thinking, and responsible digital citizenship. At the curriculum level, the findings indicate the need to move beyond isolated digital skills training toward design-oriented models of digital literacy education. Curriculum developers should consider integrating sustainability-oriented learning outcomes, multimodal digital texts, and collaborative communicative activities across language programs. The results suggest that digital competence develops most effectively when learners repeatedly engage in instructional cycles involving exposure, critical analysis, collaborative production, and reflective evaluation. Such an approach aligns digital literacy development with broader goals of global citizenship education and sustainable development, thereby contributing to more holistic educational practices in higher education contexts.

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Based on these findings, this study proposes an SDG-Embedded Techno-Pedagogical Mediation Model. The model synthesizes the relationships among sustainability-oriented content, multimodal digital authentic texts, communicative instructional processes, and digital literacy development. Figure 1 illustrates the interaction among these elements.

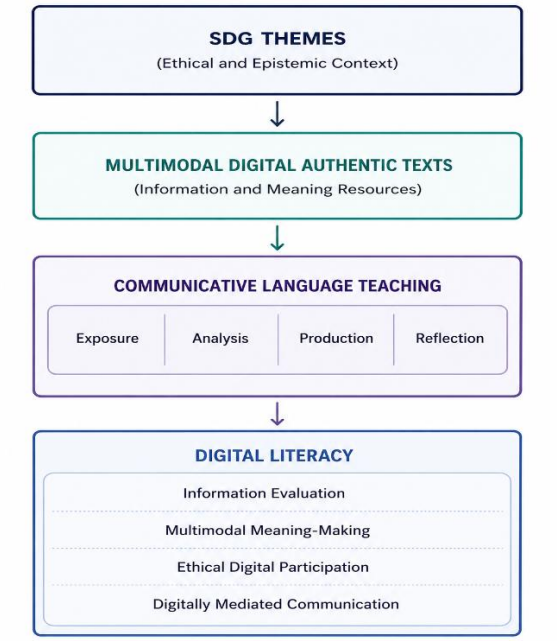


Figure 1. SDG-Embedded Techno-Pedagogical Mediation Model

As illustrated in Figure 1, digital literacy development is mediated through the interaction of sustainability-oriented content (SDGs), multimodal digital authentic texts, and communicative instructional processes. The model proposes that these three elements do not operate independently; rather, they mutually reinforce one another to create conditions that support information evaluation, multimodal meaning-making, ethical digital participation, and digitally mediated communicative competence.

The model conceptualizes digital literacy as the outcome of interaction among three interconnected elements: (1) SDG-based sustainability discourse as the ethical and epistemic context, (2) multimodal digital authentic texts as the semiotic and informational medium, and (3) Communicative Language Teaching as the pedagogical mechanism that structures engagement through exposure, analysis, production, and reflection. Through the interaction of these elements, students develop four interrelated dimensions of digital literacy: information evaluation, multimodal meaning-making, ethical digital participation, and digitally mediated communicative competence. Unlike UNESCO and DigComp frameworks, which primarily describe competency domains, the proposed model emphasizes the pedagogical processes through which those competencies emerge in instructional practice. In this sense, the model contributes a process-oriented explanation of digital literacy development in technology-enhanced language education and highlights the importance of pedagogical design as the principal mediator of digital competence formation (Nurlina et al., 2025).

CONCLUSION

This study examined how the integration of SDG-themed digital authentic texts within communicative, technology-enhanced instruction supports the development of students' digital literacy in higher education. The findings indicate that digital competence develops through structured instructional design that connects learning activities with global issues and is organized around stages of exposure, analysis, production, and reflection. The integration of SDGs encouraged students to

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engage more critically in evaluating information, interpreting multimodal messages, and demonstrating responsibility in digital participation. Furthermore, multimodal digital texts supported students in interpreting data, constructing persuasive messages, and collaborating in the production of digital content. The findings also suggest that digital literacy development is most effective when communicative pedagogy, sustainability-oriented content, and multimodal digital authentic texts are intentionally integrated within technology-enhanced learning environments. Accordingly, this study proposes an SDG-Embedded Techno-Pedagogical Mediation Model that conceptualizes digital literacy as emerging from the interaction among sustainability discourse, multimodal digital resources, and communicative instructional processes. Despite these contributions, several limitations should be acknowledged. First, the study involved a relatively small sample of 28 undergraduate students, which may limit the transferability of the findings to broader educational contexts. Second, the research was conducted within a single English Language Education program at one university, and therefore the findings should be interpreted within the specific institutional context in which the study was situated. Third, the instructional intervention was implemented over a period of ten weeks, which may not fully capture the long-term development of students' digital literacy practices and competencies. These limitations suggest that caution is needed when generalizing the findings beyond the present research setting. Future research should examine the applicability of the proposed model in different educational contexts, involve larger and more diverse participant groups, and investigate the long-term development of digital literacy. Further studies may also explore the integration of emerging technologies and SDG-themed digital authentic texts in various language learning environments.

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