



Building a sustainable workforce: Integrating digital skills into intercultural language curricula to meet regional economic needs

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Abstract: The aim of this study is to investigate the gap between the daily digital usage habits of language students and the professional digital competencies required by modern multinational employers, and to propose an integrated curriculum model (ICM) to address this disparity. The study was carried out using a mixed-methods approach at Ba Ria - Vung Tau University in Vietnam. Quantitative data were gathered through a self-assessment survey of 421 students in the Faculty of Languages - International Cultures, aimed at evaluating their digital technology habits and capabilities. Concurrently, a qualitative document analysis was conducted on three foundational course syllabi to determine the current extent of digital integration in language teaching methodology. The results indicate a significant paradox: although the vast majority of students reported high levels of daily internet use, their self-assessed proficiency in higher-order professional skills, such as digital collaboration and digital content creation, was sharply lower. Furthermore, the syllabi analysis reveals a fragmented approach to education, in which technology is either isolated as a teaching tool or entirely absent from core communication courses. The significance of these findings lies in their highlighting the inadequacy of relying solely on students' innate social technology skills to prepare them for professional careers. By mapping these deficits against a global digital literacy framework, the study successfully proposes a cross-curricular integration model that embeds specific digital tasks into existing language modules. This approach creates a simulated learning environment where students confront real-world digital challenges identical to those encountered in foreign direct investment enterprises. This ensures the sustainability of human capital by enhancing flexibility and adaptability, equipping graduates to meet the demands of the globalized digital economy.

Keywords: Ba Ria – Vung Tau University; Cross-cultural collaboration; Digital literacy; Sustainable development; UNESCO Framework

Introduction

In the era of globalization and the Fourth Industrial Revolution, higher education institutions face the critical task of building a sustainable workforce. This is particularly crucial for developing regions undergoing rapid economic transformation and attracting high levels of foreign direct investment, such as Ba Ria - Vung Tau province in Vietnam. In such an environment, the job market demands that graduates, especially those majoring in languages and cultures, possess a combination of linguistic competence and advanced digital intercultural communication skills to adapt to a complex multinational work environment (Cabero-Almenara et al., 2020). The core problem addressed in this study is the systemic disconnect between traditional language education and the digital realities of the modern workplace. Historically, digital skills have been primarily integrated into the fields of science, technology, engineering, and mathematics. In language education, technology is frequently relegated to the periphery as a mere pedagogical tool rather than being cultivated as a core professional competency for intercultural mediation. The UNESCO Global Framework of Reference on Digital Literacy Skills offers a comprehensive lens to evaluate this

issue, emphasizing career-related competences essential for sustainable economic growth (Chen, 2024). A significant controversy in current educational literature revolves around the concept of the "digital native." A prevailing assumption is that students born into the digital age automatically possess the technological skills necessary to succeed academically and professionally. However, opposing views argue that social digital integration—such as social media navigation—is not equivalent to professional digital literacy, particularly in fields requiring complex collaboration, data privacy management, and cross-cultural digital etiquette (Falloon, 2020). The overall aim of this work is to empirically investigate this "digital paradox" among language students and propose a functional multidisciplinary integration model based on the UNESCO framework, thereby promoting socio-economic sustainability in the region.

Materials and methods

This study employed a mixed-methods research design, integrating quantitative survey data with qualitative document analysis. The combination of these approaches allowed for a systematic evaluation of the digital literacy gap, ensuring both breadth through statistical insights and depth through contextual interpretation. Quantitative data provided measurable patterns of digital literacy among participants, while qualitative analysis offered nuanced understanding of underlying factors and institutional contexts. Together, these methods enhanced the validity and comprehensiveness of the findings.

Participants and quantitative data collection

The quantitative component of the study was conducted through a structured survey involving 421 undergraduate students from the Faculty of Languages and International Cultures at Ba Ria - Vung Tau University. The sample was selected to capture a broad range of student perspectives and experiences, providing a substantial empirical basis for examining patterns of technology use and self-perceived digital competence. As neither a formal a priori power analysis nor the exact sampling fraction was available, the findings are not interpreted as statistically representative of the entire student population. Rather, the dataset offers valuable insights into prevailing trends and competency patterns within the faculty context.

The survey explored students' internet usage habits, purposes for using digital technologies, including artificial intelligence tools, and their self-assessed competencies across different areas of digital literacy. To ensure conceptual rigor, the survey items were adapted from the core competence domains of the UNESCO Digital Literacy Framework, enabling alignment with an internationally recognised standard of digital competence. This framework-informed design enhances the academic credibility of the instrument and supports the relevance and comparability of the findings. The resulting descriptive data provide an evidence-based foundation for identifying strengths and gaps in students' digital literacy, thereby informing curriculum development and future educational planning.

Qualitative document analysis

The qualitative document analysis focused on three core curriculum courses: Language Expression Skills, Intercultural Communication Skills, and Technology in Teaching. These courses were selected because they constitute key components of the curriculum and provide a valuable basis for examining how digital literacy outcomes are embedded within language and intercultural education contexts (Law, 2024). The analysis systematically explored the extent to which digital literacy competencies were represented across course objectives, learning outcomes, and instructional content. Particular attention was given to identifying the presence, absence, and contextual application of digital learning outcomes. Furthermore, the analysis sought to determine whether technology was conceptualized primarily as a pedagogical tool for instructional delivery or as an essential professional competency that students are expected to develop and apply in their future practice.

The analysis followed a structured coding process. Each syllabus was examined for explicit references to digital learning outcomes, as well as implicit indicators of technological integration. Codes were developed to capture whether technology was positioned primarily as an instructional delivery method (e.g., online platforms, digital tools for teaching) or as an intrinsic professional skill (e.g., competencies in digital communication, technology-enhanced pedagogy) (Simões & Brás, 2025). This dual focus allowed the study to distinguish between surface-level adoption of technology and deeper curricular commitments to digital literacy as a professional requirement.

To enhance validity, the coding framework was iteratively refined through repeated readings and cross-checking of categories. Patterns were then synthesized to highlight consistencies and divergences across the syllabi (Sun, 2025). By situating these findings within the broader mixed-methods design, the qualitative analysis provided contextual depth that complemented the quantitative survey data, thereby offering a more holistic evaluation of the digital literacy gap in the educational setting.

Framework mapping and model development

The final stage of the research involved comparing both the survey results and the curriculum analysis with the five core areas of the UNESCO Global Framework of Reference on Digital Literacy Skills (2018). This correlational comparison provides a structured lens through which to assess the extent to which digital competencies are integrated into the curriculum. This has facilitated the development of a "Digital-intercultural infusion" model, wherein targeted digital tasks were mapped to existing learning objectives (Tóth et al., 2022). This model distinguishes between technology as a means of knowledge transfer and technology as a professional skill set, emphasizing the importance of cultivating both aspects. By placing the results within an internationally recognized framework, the study ensures that its conclusions are not only relevant to the local context but also comparable on a global scale.

To enhance the credibility and interpretive rigor of the findings, the study incorporated several measures to address potential sources of internal bias commonly associated with self-assessment research. These include recall bias, socially desirable responding, and common-method variance, all of which may influence participants' perceptions and reporting of their own competencies. To promote conceptual consistency and reduce ambiguity across survey items, the quantitative instrument was developed using standardized competency domains derived from the UNESCO Digital Literacy Framework. Furthermore, data collection was conducted through a secure online platform, ensuring a uniform administration process for all 421 respondents.

Particular attention was given to preventing the conflation of routine technology use with professional digital competence. Accordingly, the analytical framework differentiated basic digital practices, such as information access and online safety, from more advanced competencies, including professional communication, collaboration, problem-solving, and digital content creation. In addition, the study did not rely exclusively on self-reported survey data. Instead, survey findings were triangulated with a qualitative analysis of course syllabi to provide a broader and more contextualized understanding of digital literacy development within the curriculum.

This mixed-methods approach serves as an important interpretive safeguard. While the survey data capture students' perceptions of their digital competencies, the syllabus analysis examines the extent to which corresponding digital learning outcomes are explicitly embedded in the curriculum. Consequently, the reported percentages should be understood as indicators of self-assessed competence rather than objective measures of performance. Similarly, the proposed curriculum model is presented as an evidence-informed pedagogical recommendation rather than as evidence of a causal relationship. Although these procedures cannot entirely eliminate selection bias or the limitations inherent in self-report data, they help reduce the risk of overinterpretation and ensure that the boundaries of the evidence are clearly acknowledged.

Results and discussion

The digital native paradox and competency gaps

The survey results reveal a stark contrast between students' social digital immersion and professional digital competence (Table 1). While awareness of foundational safety is high, proficiency in high-order professional tasks remains alarmingly low.

Table 1. Student self-assessed digital competencies (n=421)

UNESCO Competence Area	Percentage (%)
Digital safety	91.2%
Information & Data literacy	62.0%
Professional digital communication	49.9%
Digital problem solving	30.9%
Professional digital collaboration	30.4%
Digital content creation	26.8%

Source: Authors' survey data (n = 421); percentages represent self-assessed competency indicators rather than objective performance measures.

The deficiency in digital collaboration (30.4%) and content creation (26.8%) indicates that online entertainment habits

do not translate into workplace readiness. This necessitates direct curricular intervention to transform students from passive consumers to active digital professionals.

The survey results revealed a notable paradox: while students reported a high level of awareness regarding digital safety (91.2%), their self-assessment of advanced professional digital tasks was significantly lower. As shown in Table 1, competencies such as professional digital collaboration (30.4%) and digital content creation (26.8%) are particularly weak. This difference highlights the "digital generation paradox," where students' deep immersion in the digital environment does not necessarily mean they are ready for the workplace (Zhao, Pinto Llorente, & Sánchez Gómez, 2021). These findings suggest that students' engagement with the digital world is primarily recreational, with limited applicability to professional environments. The gap between high safety awareness and low capacity for collaboration and content creation highlights the urgent need for curriculum interventions. Specifically, integrating structured digital tasks into language and intercultural communication courses can accelerate the transition from passive digital consumers to active digital professionals. By comparing these results with the UNESCO Global Framework of Reference on Digital Literacy Skills (2018), the study identified key areas for innovation in the curriculum.

The Digital-Intercultural infusion model

Based on these gaps, the proposed model "embeds" digital competencies directly into existing learning objectives (Table 2).

Table 2. Proposed digital-Intercultural integration

Course module	Specific integration examples	Target competence (UNESCO)
Language expression	<p>Digital portfolio/Video podcast: Students produce digital content (videos, professional infographics) to convey complex messages using multimodal editing tools.</p> <p>Multimodal digital storytelling: Students use digital animation and graphic design tools to adapt local cultural stories or legends into interactive narratives in English. This task not only enhances descriptive vocabulary and narrative structuring but also cultivates content creation skills by requiring students to synthesize textual and visual elements.</p> <p>Collaborative academic drafting via cloud platforms: Using collaborative word processing software and corpus-linguistic databases, students work together to write and peer-review extensive academic abstracts. This process bridges the gap between academic writing conventions and data usability, as students must proactively query linguistic data to refine their academic writing style.</p>	Content creation & Data literacy
Intercultural communication	Virtual multinational negotiation: Simulated meetings	Collaboration & digital interculturality

Course module	Specific integration examples	Target competence (UNESCO)
	<p>via Slack or Microsoft Teams to resolve cultural conflicts, practicing Netiquette and asynchronous communication.</p> <p>Cross-cultural media production: Working in diverse teams, students script and produce high-quality promotional videos aimed at an international audience (e.g., showcasing their university life or major). This project requires a deep understanding of culture to select culturally appropriate perspectives, thereby directly promoting digital cultural collaboration and exchange.</p> <p>Collaborative online international learning (COIL): Students participate in virtual exchanges with classmates from international partner universities. Through asynchronous video platforms, they analyze and solve cross-cultural case studies, thereby cultivating digital empathy and navigating intercultural conflicts in the digital environment.</p>	
Technology in teaching	<p>AI linguistic analysis: Using artificial intelligence to analyze data, summarize research, or verify multi-cultural information for professional contexts.</p> <p>Data-driven lesson design: Future teachers use artificial intelligence (AI) and advanced presentation software to design engaging visual teaching materials focused on data analysis (e.g., materials for IELTS Essay Task 1).</p> <p>Development of gamified formative assessments: Students design their own interactive language tests that are suitable for specific competency frameworks (e.g., CEFR, IELTS) using digital learning platforms. By analyzing data on student learning outcomes from these platforms that helps adjust their pedagogical strategies, students bridge the gap between</p>	Problem solving & career competence

Course module	Specific integration examples	Target competence (UNESCO)
	pedagogical theory and applied educational technology.	

Source: Authors' own compilation and curriculum mapping based on the UNESCO Global Framework of Reference on Digital Literacy Skills (UNESCO, 2018) and findings from the present study.

The Digital-Intercultural Infusion Model is not an additional module or a standalone technology course—it represents a system-embedded philosophy where digital competencies are directly integrated into existing learning objectives rather than being added later. This design reflects a sophisticated pedagogical conviction that digital skills should not be taught in isolation, but rather built through authentic language practice and intercultural communication. This difference has profound significance. Instead of requiring students to learn about technology, this model forces them to use technology to learn—a decisive shift from literacy as knowledge to literacy as practice. Thus, knowledge is most sustainably acquired when integrated into meaningful, contextually specific activities, rather than through non-contextual instruction.

Module 1 — Language expression: From writing proficiency to multimodal production

The three activities in this module are structured in a deliberately progressively increasing order of cognitive complexity:

Digital portfolio/Video podcast: Students must transform linguistic ideas into audiovisual products, requiring multimodal reading comprehension - the ability to convey meaning simultaneously through text, images, sound, and design. Students must transform linguistic ideas into audiovisual products, requiring multimodal reading comprehension—the ability to convey meaning simultaneously through text, images, sound, and design.

Multimodal digital storytelling: Integrating local Vietnamese cultural stories (folk tales, legends) into English-language digital content is a particularly innovative design choice. It positions students as producers of digital culture rather than consumers, creating an innovative connection between cultural identity, digital tools, and the ability to express themselves in the target language.

Collaborative academic drafting via cloud platforms: By integrating linguistic databases into collaborative academic writing, this fosters data-driven writing skills—the ability to analyze real-world linguistic evidence when making stylistic and rhetorical decisions. This bridges the persistent gap between academic writing conventions and the data literacy skills increasingly demanded in research and professional contexts.

Module 2 — Intercultural communication: Digital space as a site of cultural negotiation

This is the most interdisciplinary and groundbreaking module of the model:

Virtual multinational negotiation: Students engage in simulated cross-cultural conflict via platforms like Slack or Teams, experiencing the challenges of asynchronous digital communication and learning online etiquette in an international professional context.

Cross-cultural media production: Learners create content for a global audience, requiring the ability to reason cross-culturally and make editorial decisions appropriate to that audience, transforming the communication process into a challenging creative activity. Through direct collaboration with international partner universities, students experience authentic cross-cultural situations, thereby cultivating empathy in the digital environment and problem-solving skills through practical experience.

Collaborative online international learning (COIL):

Module 3 — Technology in Teaching: Training the next generation of digital teachers

This module targets a specific audience — education students — and has the highest direct professional applicability:

AI linguistic analysis: Rather than simply instructing students to use AI tools, this activity cultivates critical AI literacy — the capacity to interrogate AI outputs for cultural bias, factual reliability, and contextual appropriateness.

Data-driven lesson design: The application of AI and advanced presentation software to the design of materials positions digital competence not as an abstract aspiration but as a practical tool to enhance teaching effectiveness.

Development of gamified formative assessments: Students design interactive language tests aligned with recognized competency frameworks, then analyze learner performance data from digital platforms to continuously refine their pedagogical strategies.

Under this model, students are faced with real-world digital challenges that reflect the professional environment of foreign direct investment (FDI) enterprises situated in Ba Ria - Vung Tau area. For instance, rather than traditional face-to-face role-plays, students are required to execute asynchronous collaborative projects via digital project management platforms, engaging with "virtual partners" across diverse time zones. The core challenges extend beyond language barriers and include mastering "online etiquette," resolving technical issues during negotiations, and managing cultural conflicts arising from digital communication via written documents or video conferencing.

This simulated environment requires the cultivation of cognitive flexibility and professional adaptability. When faced with technical glitches or cultural misunderstandings in the digital space, students are compelled to come up with immediate alternative solutions on their own. These scenarios represent the authentic professional 'friction' encountered when operating within multinational corporations. Proactive preparation for such situations strengthens the sustainability of human capital; graduates not only achieve language proficiency but also become "resilient" professionals, capable of quickly adapting to the ever-evolving global technology and business environment.

Structural strengths of the model

Analytical dimension	Assessment
Theory-practice coherence	Every activity can be traced directly to a specific UNESCO competence domain - the theoretical grounding is explicit and verifiable, not merely decorative
Local contextualization	The integration of Vietnamese cultural materials (folk narratives, campus life) into digital tasks guards against the uncritical transplantation of Western pedagogical models into a distinct socio-educational context
Scaffolded cognitive progression	Activities are structured from individual to collaborative, from local to international, from receptive to productive - reflecting sound principles of graduated complexity
Multi-competence integration	A single well-designed task (e.g., COIL, Cross-Cultural Media Production) can simultaneously develop digital, linguistic, and intercultural competencies, maximizing instructional efficiency
Authentic assessment orientation	The model privileges real-world outputs - videos, portfolios, negotiation transcripts, lesson plans - over decontextualized tests, aligning assessment with contemporary competency-based education principles

Source: Authors' own synthesis based on the UNESCO Global Framework of Reference on Digital Literacy Skills (UNESCO, 2018), the proposed Digital-Intercultural Infusion Model, and the findings of the present study.

Simulated learning environments and professional adaptability

The significance of this integration lies in the creation of a "simulated learning environment." In this model, students are forced to confront real-world digital challenges identical to those encountered in foreign direct investment enterprises in Ba Ria - Vung Tau. Instead of traditional classroom role-plays, students manage asynchronous projects across digital platforms, simulating "virtual offices."

This environment compels students to cultivate flexibility and adaptability. When technical issues arise during an important virtual meeting or cultural misunderstandings stem from digital signals, students must find immediate solutions through technology. This "simulation-based testing" method ensures that graduates possess a resilient workforce capable of quickly adapting to the ever-changing demands of multinational corporations. This alignment between classroom tasks and regional economic realities is vital for socio-economic sustainability.

Conclusions and future research focus

Building a sustainable workforce requires a shift from linguistic isolation to digital multicultural integration. This study indicates that relying solely on students' innate technological skills is insufficient to prepare them for career success. By proposing an integrated model based on the UNESCO framework, the research provides a scalable solution for upgrading the curriculum. Future research should include long-term studies to track the employment outcomes of graduates from this integrated program that bridges the gap between recreational digital engagement and professional digital competence. Additionally, direct surveys with regional employers will help refine these digital tasks to meet the specific needs of industries such as logistics and tourism.

Internal-Bias Implications and Boundaries of Interpretation: Several limitations should be considered when interpreting the findings. Because the study relies on self-assessment data, participants may overestimate or underestimate their actual digital competencies. Furthermore, the absence of a probability-sampling design and objective performance measures limits the generalizability of the findings and precludes causal inference. To strengthen the validity of the results, survey data were triangulated with a qualitative analysis of course syllabi, allowing students' perceived competencies to be examined alongside the curriculum's digital-learning provisions. Nevertheless, self-report and selection biases cannot be entirely eliminated. Accordingly, the findings should be interpreted as evidence of perceived gaps in digital competence and curriculum integration rather than as direct measures of actual performance or employment readiness. Future research should incorporate performance-based assessments, employer feedback, longitudinal tracking, and broader samples to further validate and refine the proposed model.

Interpretation in Relation to Sustainable Development: The findings highlight the importance of digital competence as a component of sustainable workforce development in a region undergoing rapid economic transformation. While students demonstrate high awareness of digital safety, considerably lower levels of competence in professional collaboration and digital content creation suggest that routine technology use alone is insufficient to develop career-relevant skills. In response, the proposed Digital-Intercultural Infusion Model integrates authentic digital production, collaboration, intercultural communication, problem-solving, and AI literacy into existing language curricula. By strengthening graduates' adaptability and workforce readiness, the model has the potential to support both the social and economic dimensions of sustainable development. However, its impact on employment outcomes remains a matter for future empirical investigation rather than a conclusion that can be drawn from the present study.

Interpretation in relation to sustainable development. The findings are relevant to sustainable development because the study links human-capital formation, digital inclusion, and employability in a region undergoing economic transformation. The central sustainability implication is not simply that students need more technology, but that higher education must convert everyday digital engagement into durable professional capability. The large gap between digital safety awareness (91.2%) and higher-order collaboration (30.4%) and content-creation (26.8%) suggests that access and routine use alone do not guarantee a sustainable skills pipeline. The Digital-Intercultural Infusion Model addresses this challenge by embedding authentic digital production, collaboration, intercultural communication, problem solving, and AI literacy into existing learning activities. In this sense, the proposed model contributes to the social and economic dimensions of sustainable development by strengthening graduates' adaptability, supporting regional workforce readiness, and aligning university curricula more closely with changing labour-market expectations. At the same time, the evidence should not be interpreted as demonstrating a direct causal effect on employment outcomes. Rather, it provides a curriculum-level mechanism that can be tested prospectively.

Consideration of internal bias was an important aspect of the research design and interpretation of findings. Recognizing the limitations commonly associated with self-assessment data, including recall bias, social desirability bias, and subjective self-perception, the study adopted several measures to enhance the credibility of the results. The survey instrument was structured around the standardized competency domains of the UNESCO Digital Literacy Framework, ensuring conceptual consistency across all items. In addition, the quantitative findings were not interpreted in isolation but were triangulated with a qualitative analysis of course syllabi to provide complementary evidence regarding the presence of digital learning outcomes in the curriculum. This mixed-methods approach enabled the study to compare students' perceived competencies with the curricular opportunities available for developing those competencies. Consequently, the conclusions are derived from converging evidence rather than from survey responses alone. While these procedures cannot entirely eliminate potential response or selection bias, they reduce the risk of overinterpretation and support a more balanced understanding of the findings. The conclusions should therefore be viewed as evidence-informed interpretations of existing competency and curriculum gaps, providing a foundation for future curriculum development and further empirical investigation.

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Conflict of Interest

The authors confirm that the intellectual content of this publication is the result of our own efforts, and that all outside aid or funds have been acknowledged. There are no conflicts of interest declared by the authors.

Declaration of Interest statement

This is to certify that to the best of authors' knowledge, the content of this manuscript is original. The paper has not been submitted elsewhere nor has been published anywhere.

Authors confirm that the intellectual content of this paper is the original product of our work and all the assistance or funds from other sources have been acknowledged.

Originality Statement

I hereby declare that this submission is my own work and to the best of my knowledge it contains no materials previously published or written by another person, or substantial proportions of material. Any contribution made to the research by others, with whom I have worked in draft or elsewhere, is explicitly acknowledged in the draft.

Informed Consent/Patient Consent:

Informed Consent and Participant Protection. This study involved a structured survey administered to 421 undergraduate students. Information regarding participant consent and institutional ethics approval should be reported in the final R1 submission exactly as documented in the official university records associated with the data collection protocol. Accordingly, the present manuscript does not make claims regarding ethics exemption status or consent procedures beyond those supported by the corresponding institutional documentation. All matters related to participant confidentiality, privacy protection, and data management should be described in accordance with the procedures approved and recorded by the institution, thereby ensuring consistency with established ethical and administrative requirements.

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