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Critical Digital Literacy and Ethical Reflection in AI-Mediated FLE Teacher Education: Exploring Pedagogical Integration in a Mexican University

Alfabetización digital crítica y reflexión ética en la formación docente de FLE mediada por IA: integración pedagógica en una Universidad mexicana

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Abstract:

In recent years, artificial intelligence has become increasingly visible in higher education practices. Still, in French as a Foreign Language (FLE) teacher education, many discussions remain focused on the instrumental use of digital tools rather than on the pedagogical, ethical, and critical dimensions of their integration into classroom practice. This article examines an experience developed in a university-level FLE teacher education program in Mexico, based on a competency-oriented approach articulated with frameworks such as DigCompEdu by Redecker, TPACK by Mishra & Koehler, and the UNESCO AI Competency Framework for Teachers. Using a qualitative and practice-based perspective, the study explored activities related to the critical evaluation of AI-generated content, the redesign of pedagogical tasks, and argumentative production in French. The findings suggest developments in metacognitive reflection, a stronger alignment between pedagogical objectives and digital tool use, and a greater awareness of issues related to bias, authorship, and academic integrity (Area & Adell, 2021). Rather than presenting AI as an automatic solution, the article argues that it should be understood as a pedagogical mediation space that requires critical judgment and ethical positioning from future language teachers

Keywords:

FLE. Artificial intelligence. Teacher education. Digital literacy

Resumen:

En los últimos años, la inteligencia artificial se ha vuelto cada vez más visible en las prácticas de educación superior. Sin embargo, en la formación docente en Francés Lengua Extranjera (FLE), muchas discusiones siguen centradas en el uso instrumental de herramientas digitales más que en las dimensiones pedagógicas, éticas y críticas de su integración en la práctica educativa. Este artículo analiza una experiencia desarrollada en un programa universitario de formación docente en FLE en México, basada en un enfoque por competencias articulado con marcos como DigCompEdu, planteado por Redecker, el TPACK, por Mishra y Koehler, y el UNESCO AI *Competency Framework for Teachers*. Desde una perspectiva cualitativa y basada en la práctica, el estudio exploró actividades relacionadas con la evaluación crítica de contenidos generados por IA, el rediseño de tareas pedagógicas y la producción argumentativa en francés. Los hallazgos sugieren avances en la reflexión metacognitiva, una relación más coherente entre objetivos pedagógicos y uso de herramientas digitales, así como una mayor conciencia sobre cuestiones vinculadas con sesgo, autoría e integridad académica. Más que presentar la IA como una solución automática, el artículo sostiene que debe entenderse como un espacio de mediación pedagógica que exige juicio crítico y posicionamiento ético por parte de los futuros docentes.

Palabras Clave*:*

FLE. Inteligencia artificial. Formación docente. Alfabetización digital crítica.

Introduction

The rapid expansion of generative artificial intelligence has transformed many academic and social environments in a relatively short period of time (Flores-Vivar & García-Peñalvo, 2023; Luckin et al., 2016; UNESCO, 2021). Since the public emergence of tools such as ChatGPT, Gemini, Claude or Copilot, universities have been trying to respond to new questions related to authorship, assessment, academic integrity, and pedagogical innovation (García-

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Peñalvo, 2024). In some institutions, reactions were initially defensive and centered mostly on plagiarism concerns. In others, teachers and researchers started exploring the educational possibilities of AI-based systems, especially in areas related to writing support, content generation, and personalized learning (Russell & Norvig, 2020; Zawacki-Richter et al., 2019).

In foreign language education, these technologies have generated both enthusiasm and uncertainty (Godwin-Jones, 2021). AI tools can produce texts instantly, simulate interactions, generate exercises, adapt content, or provide immediate linguistic feedback (Kohnke et al., 2024). These tools create new opportunities for language teachers while also introducing significant pedagogical tensions. If learners can automatically generate written production, summarize texts, or receive instant corrections, then the role of the teacher and the meaning of language learning itself begin to shift (Area & Adell, 2021; Selwyn, 2021). Within the field of French as a Foreign Language (FLE), discussions about AI integration are still relatively fragmented. Many proposals focus on presenting digital tools or technological applications without really examining the pedagogical logic behind them or the action-oriented principles (perspective actionnelle) of language acquisition (Ollivier, 2018; Puren, 2004). In practice, technology is sometimes added to classroom activities without questioning how it changes learning processes, teacher mediation, or students' ways of constructing knowledge (Cuq & Gruca, 2018).

At the same time, international frameworks related to digital competence and AI in education have become increasingly influential. DigCompEdu proposes a structured model for teachers' digital competencies, emphasizing pedagogical integration rather than technical skills alone (Redecker, 2017). The TPACK (Technological Pedagogical Content Knowledge) model emphasizes that effective AI integration in language education depends on the interaction between technological, pedagogical, and disciplinary knowledge, positioning digital tools as means of supporting pedagogical objectives and language learning processes rather than being used solely for their technological novelty (Mishra & Koehler, 2006).

More recently, the UNESCO AI Competency Framework for Teachers introduced ethical and governance dimensions connected to artificial intelligence in educational contexts (UNESCO, 2024). Even though these frameworks provide useful orientations, their implementation in language teacher education often remains superficial or disconnected from discipline-specific realities (Moorhouse & Kohnke, 2024). In many teacher educations programs, future language teachers still receive limited preparation for critically integrating AI into pedagogical practice. Frequently, technological training focuses on tool manipulation rather than on reflective decision-making and critical literacy (Biesta, 2015; García-Peñalvo, 2024).

This present study responds to this context. Instead of asking whether AI is "good" or "bad" for education, the study explores how competency-based FLE teacher education can integrate artificial intelligence in ways that remain pedagogically coherent and ethically grounded. The experience presented here was conducted in a Mexican university-level FLE teacher education program and focused on helping future teachers critically evaluate AI-generated content, redesign pedagogical tasks, and reflect on the implications of using AI in language classrooms. The objective was not to promote technology for its own sake. Rather, the project aimed to observe how future teachers negotiate pedagogical choices when AI becomes part of classroom practice, and how digital literacy can move beyond technical efficiency toward more critical and reflective forms of professional development.

Method

This study adopted a qualitative case study design conducted in a public university in Mexico within a French as a Foreign Language (FLE) teacher education program. Participants were 18 pre-service FLE teachers enrolled in courses on didactics, instructional design, and educational technologies. The research followed a practice-based approach inspired by reflective teacher education perspectives (Schön, 2017) and sought to examine how participants engaged with AI-mediated pedagogical practices in authentic educational settings. Rather than measuring learning outcomes quantitatively, the study explored how future teachers critically integrated artificial intelligence into pedagogical decision-making through classroom activities, reflective journals, written productions, oral discussions, and AI-supported instructional tasks.

The participants in this study were 18 pre-service FLE teachers between 20 and 24 years old enrolled in a public university language teacher education program in western Mexico. Most participants had an estimated French proficiency level between B1 and B2 according to CEFR descriptors. The project was implemented over a sixteen-week semester and included twelve structured pedagogical activities combining AI-mediated task design, critical analysis of generated content, and reflective production in French.

During the study, participants worked primarily with ChatGPT (GPT-4), Google Gemini, and Microsoft Copilot. These tools were used to generate grammar explanations, communicative dialogues, reading comprehension activities, argumentative prompts, and lesson plans in French. Students were asked to formulate prompts related to specific pedagogical objectives (e.g., "Generate a B1-

level dialogue illustrating the use of the subjunctive in everyday interaction" or "Design a communicative task to practice environmental vocabulary in FLE"). Each AI-generated output was subsequently analyzed using criteria including linguistic accuracy, pedagogical coherence, intercultural appropriateness, authenticity, and potential algorithmic bias. Participants then redesigned or adapted the generated materials and documented their reflections in individual journals.

Table 1. AI-mediated pedagogical activities implemented during the intervention

Activity	AI tool	Example prompt	Expected outcome
Grammar explanation	ChatGPT	*Explain the use of the imparfait for B1 learners.*	Critical evaluation
Dialogue generation	Gemini	*Create an authentic dialogue between two university students.*	Analysis of authenticity
Lesson planning	Copilot	*Design a communicative lesson on climate change.*	Pedagogical redesign
Argumentative writing	ChatGPT	*Write an argumentative text about AI in education.*	Reflection and revision

Source: Authors' own elaboration based on the instructional design implemented during the study.

It was focused on pedagogical redesign. Participants selected existing language learning activities and adapted them using AI tools while maintaining explicit pedagogical objectives aligned with competency-based approaches. Particular attention was given to communicative interaction, learner autonomy, and the coherence between technological choices and teaching intentions. Students were encouraged to justify the pedagogical relevance of AI integration rather than simply adopting digital tools because they appeared innovative or efficient.

The final stage centred on reflective writing and argumentative discussion in French. Participants produced reflective journals and short analytical texts addressing themes such as authorship, algorithmic bias, dependence on automated systems, academic integrity, and the evolving role of language teachers in AI-mediated learning environments. These discussions often moved beyond technical considerations and opened broader reflections on ethics, professional responsibility, and digital literacy in language education.

Data collection included classroom observations, written productions in French, reflective journals, oral discussions, and pedagogical tasks designed by participants. The analysis followed a thematic analysis organized around three central dimensions: the relationship between pedagogical objectives and AI use, the development of critical and metacognitive reflection, and the evolution of digital and discursive competencies. Given its qualitative case study design, the study does not seek to generalize its findings universally. Rather, it contributes to current discussions on teacher education by examining how AI integration is experienced, negotiated, and pedagogically interpreted within a specific FLE training context.

Initial coding was conducted independently by the researcher using an inductive approach. Emerging categories were then grouped into broader themes related to pedagogical coherence, ethical awareness, intercultural representation, and critical digital literacy. The final coding framework was refined through iterative comparison of reflective journals, classroom discussions, and pedagogical artifacts. Reflective journals, classroom discussions, and written productions were coded manually using recurring categories related to pedagogical coherence, ethical awareness, intercultural representation, and critical digital literacy. To strengthen analytical consistency, data triangulation was conducted through comparisons between reflective journals, oral interactions, and pedagogical tasks designed by participants.

Discussion

A prominent finding in the productivity-oriented category identified in Table 2, was that 12 of the 18 participants initially described AI primarily as a time-saving tool. Several students used generative AI mainly to save time when preparing classroom materials, generating grammar exercises, or producing lesson ideas. In some cases, the pedagogical proposals remained relatively traditional despite the incorporation of digital tools. Technology was sometimes used to accelerate existing practices rather than to rethink them. This tendency reflects a broader phenomenon already identified in discussions about educational technologies, where innovation is occasionally reduced to efficiency and automation instead of pedagogical transformation (Area & Adell, 2021).

This perspective also resonates with Freire's (1970) notion of critical consciousness, since participants were encouraged not only to use technology but also to question its ideological and pedagogical implications. In a similar way, Selwyn (2021) argues that digital technologies should not be approached as neutral educational solutions but as sociotechnical systems shaped by institutional and economic interests. Biesta (2015) has also criticized the growing "learnification" of education, where efficiency and optimization sometimes replace broader educational purposes related to subject formation and critical judgment. From a complexity perspective, Morin (1999) reminds us that educational phenomena cannot be reduced to purely technical variables detached from social and cultural realities. Likewise, Illich (1971) warned about forms of institutional dependency generated through

technological systems presented as universally emancipatory.

Regarding linguistic standardization (Table 2), in one activity, ChatGPT generated a pedagogical dialogue intended for beginner FLE learners. Although linguistically correct, the dialogue systematically erased hesitation markers, informal discourse patterns, and sociolinguistic variation. Students noted that the generated interaction reflected an idealized and standardized version of spoken French disconnected from authentic communication practices.

Another student observed in their journal: “Les dialogues produits semblaient corrects grammaticalement, mais ils ne ressemblaient pas à de vraies conversations.” Authors such as Puren (2004) and Springer (2009) have already emphasized that language learning within action-oriented approaches requires authentic social interaction rather than the reproduction of decontextualized linguistic forms. From this perspective, AI-generated discourse may sometimes reinforce standardized representations of communication instead of fostering genuinely situated language use.

As noted in the cultural simplification category (Table 2), some AI-generated responses also reproduced subtle cultural simplifications. Francophone identities were frequently reduced to metropolitan French references, with limited representation of linguistic diversity across the francophone world. In one classroom activity, students analyzed an AI-generated dialogue representing a Parisian café interaction. Several participants identified stereotypical representations of francophone culture and overly standardized linguistic registers. One participant described the interaction as “more like a textbook fantasy than an authentic communicative situation.”

Several reflective journals revealed growing skepticism toward apparently neutral AI-generated responses. One participant wrote: “Au début, je pensais que l’IA aidait seulement à gagner du temps, mais maintenant je vois qu’elle simplifie parfois la culture et les interactions réelles.” Chiss (2018) also reminds us that language teaching inevitably carries representations of culture, legitimacy, and linguistic normativity. In that sense, the apparent neutrality of AI-generated content deserves critical attention, especially when automated systems privilege dominant linguistic varieties while marginalizing francophone diversity and sociolinguistic variation.

However, this tendency began to change as reflective activities became more central to the course, leading to the pedagogical coherence observed in the data (Table 2). Students progressively developed a more critical relationship with AI-generated content. They started identifying cultural stereotypes, linguistic inaccuracies, overly generic explanations, and communicative situations that did not correspond well to authentic language use. Some participants also noticed that AI-generated examples often reproduced simplified representations of francophone cultures or proposed interactions lacking sociolinguistic nuance. These observations became particularly important in a field such as FLE, where language learning is inseparable from intercultural understanding and contextualized communication.

Several students concluded that the educational value of AI depends less on the technology itself than on the pedagogical framework surrounding its use. In this sense, DigCompEdu provided a useful framework for connecting digital tools with explicit learning objectives and classroom strategies (Redecker, 2017). Instead of viewing technology as an external addition, students progressively integrated it into broader pedagogical dynamics involving interaction, feedback, collaboration, and learner engagement.

Similarly, the TPACK framework encouraged participants to reflect on the relationship between technological choices, disciplinary content, and teaching methodology (Mishra & Koehler, 2006). This dimension was especially relevant in FLE contexts, where communicative competence, intercultural mediation, and discourse construction remain central. Participants’ reflections indicated that effective AI integration requires more than technological familiarity; it also demands pedagogical judgment and a solid understanding of language learning processes. This observation also resonates with Gadey’s (2006) reflections on mediated language learning environments, where technological tools do not automatically generate acquisition processes unless they are integrated into coherent pedagogical scenarios. In a similar way, Cuq and Gruca (2018) insist that FLE didactics cannot be reduced to methodological techniques alone because language learning always involves cultural, discursive, and interactional dimensions.

At the same time, the integration of AI did not automatically solve existing pedagogical challenges. In certain activities, students continued reproducing transmissive teaching models even while using advanced digital tools. Technology occasionally gave the appearance of innovation without substantially transforming classroom dynamics or learner participation. This observation suggests that digital competence cannot be reduced to technical mastery alone. Pedagogical innovation still depends heavily on reflection, intentionality, and the teacher’s ability to design meaningful learning situations.

Finally, reflecting the ethical category identified in Table 2, another important aspect concerned ethical awareness. Questions related to authorship, transparency, academic integrity, and dependence on automated systems appeared repeatedly in reflective journals and classroom

discussions. Some participants expressed concern that excessive reliance on AI could weaken creativity or reduce opportunities for authentic linguistic production. Others argued that completely rejecting AI would ignore the realities students already face outside the classroom, where these technologies are becoming increasingly normalized in academic and professional contexts. The discussions were rarely polarized. Most participants did not adopt either a fully optimistic or catastrophic position regarding AI. Their reflections became more situated and pedagogically grounded over time.

The UNESCO AI Competency Framework for Teachers also contributed to expanding classroom discussions beyond technical skills alone (UNESCO, 2024). Themes such as digital citizenship, ethical responsibility, algorithmic bias, and the broader social implications of AI gradually became part of pedagogical reflection. Even if some of these conversations remained exploratory, they helped reposition teacher education within wider debates concerning technology, society, and educational responsibility. Another interesting finding was that students often became more aware of their own learning processes while critically evaluating AI-generated responses. Detecting inconsistencies, weak explanations, or problematic pedagogical suggestions required them to mobilize linguistic, didactic, analytical, and intercultural competencies simultaneously. In that sense, AI sometimes functioned less as a replacement for thinking and more as a catalyst for reflection and discussion.

This evolution was especially visible in activities involving French argumentative writing. Although participants still showed some linguistic limitations linked to their level of proficiency, many texts demonstrated increased lexical precision and more nuanced pedagogical reasoning. Students gradually moved beyond purely technical discussions and began questioning what kind of learning AI tools actually encourage. Instead of asking only whether technology makes teaching easier, they started reflecting on learner autonomy, critical thinking, and the place of human interaction in language education.

The recurrent tendencies identified during the analysis can be summarized in the following categories:

Table 2. Main findings from the thematic analysis

Analytical category	Example observed in classroom activities	Pedagogical implication
Cultural simplification	AI-generated dialogues centered almost exclusively on Parisian contexts	Limited intercultural representation
Linguistic standardization	AI systematically removed hesitations and informal markers	Reduced exposure to authentic discourse
Productivity-oriented use	Students initially used AI mainly to save preparation time	Superficial technological integration
Ethical reflection	Reflective journals discussed plagiarism, authorship, and algorithmic bias.	Development of critical digital literacy
Pedagogical coherence	Redesigned learning tasks aligned AI use with explicit communicative objectives.	Stronger integration between technology and pedagogy

Source: Authors' own elaboration based on the thematic analysis of classroom data

These findings align with broader discussions in educational research emphasizing the importance of critical digital literacy and reflective technological integration (Flores-Vivar & García-Peñalvo, 2023). Integrating AI into teacher education should probably involve more than operational training or platform familiarization. Future teachers also need opportunities to discuss ethical tensions, institutional expectations, power relations, and the cultural assumptions embedded within technological systems.

For FLE teacher education specifically, this becomes particularly important because language teaching is closely connected to discourse, representation, intercultural communication, and identity construction. The findings suggest that AI-generated content cannot be assumed to be culturally or ideologically neutral, and future teachers need the ability to evaluate not only linguistic accuracy but also pedagogical relevance, ideological implications, and cultural appropriateness. In this context, critical digital literacy becomes not only a technological competence, but also a professional and ethical one.

Conclusions

The growing presence of artificial intelligence in education is progressively changing how future teachers think about teaching, learning, authorship, assessment, and pedagogical mediation. In the field of FLE teacher education, these transformations create both opportunities and tensions that cannot be addressed through technical training alone. Knowing how to use a digital platform or generate educational content with AI does not necessarily imply understanding the pedagogical, ethical, or cultural implications of these technologies within language learning environments.

Analysis of several classroom activities indicated that AI-generated discourse tended to privilege fluency, correction, and efficiency over hesitation, negotiation of meaning, or interactional complexity. This tendency partially contradicts action-oriented perspectives in FLE didactics, where communication is understood not as the production of idealized linguistic forms, but as situated social action (Puren, 2004; Ollivier, 2018).

The experience analyzed in this article suggests that competency-based approaches can provide a useful

framework for integrating AI into language teacher education in more coherent and reflective ways. Rather than treating AI as a simple productivity tool designed to optimize tasks or accelerate lesson preparation, the project encouraged future teachers to critically evaluate generated content, justify pedagogical decisions, and reflect on ethical dimensions related to technology use. In many cases, participants gradually moved from a logic of technological efficiency toward a more pedagogically grounded understanding of AI-mediated practices.

One of the most significant aspects observed throughout the project was the development of reflective positioning among participants. As students interacted with AI-generated materials, they became increasingly aware that technological outputs are never entirely neutral. Generated responses often reflected cultural assumptions, linguistic simplifications, stereotypical representations, or pedagogical inconsistencies that required critical interpretation. This process pushed participants to mobilize not only digital competencies but also intercultural awareness, didactic reasoning, and ethical judgment.

The findings suggest that reflective and practice-based activities may support the development of metacognitive awareness, pedagogical reasoning, and critical digital literacy among pre-service language teachers. At the same time, the study also demonstrates that technological innovation does not automatically produce pedagogical transformation. In several situations, students continued reproducing traditional teaching approaches despite using sophisticated AI tools. This suggests that the presence of technology alone is insufficient to generate meaningful educational change. Critical reflection remains essential in order to avoid superficial forms of digital integration.

Another important observation concerns the evolving role of the language teacher in AI-mediated environments. Rather than becoming less relevant, the teacher's role may actually become more complex. Future educators will increasingly need to evaluate the quality, appropriateness, and implications of automated content while maintaining pedagogical coherence and human mediation. In language education specifically, this challenge becomes particularly significant because communication, interaction, discourse construction, and intercultural interpretation remain deeply human processes that cannot be entirely delegated to automated systems.

More broadly, the article argues that artificial intelligence should not be understood only as a technological issue but also as a pedagogical, ethical, epistemological, and cultural one. Discussions surrounding AI in education frequently focus on efficiency, innovation, or institutional adaptation, but less attention is sometimes given to questions related to power, representation, linguistic norms, academic dependency, or the transformation of knowledge production itself. In this sense, teacher education programs have an important responsibility in preparing future educators not only to use AI tools, but also to question them critically.

The study also highlights the importance of integrating ethical reflection into digital competence frameworks. Models such as DigCompEdu, TPACK, and the UNESCO AI Competency Framework for Teachers provide useful orientations, but their pedagogical relevance depends largely on how they are interpreted and implemented within local educational realities. In contexts such as FLE teacher education, where language learning is closely linked to identity, discourse, and intercultural communication, critical digital literacy becomes inseparable from professional responsibility.

Although this research was conducted within a specific university context in Mexico, it opens several possibilities for future studies on AI integration in language teacher education. Further research could explore how different institutional settings, levels of linguistic proficiency, or educational cultures influence teachers' perceptions and uses of AI. Additional studies may also examine long-term effects of AI-mediated pedagogical practices on learner autonomy, critical thinking, and communicative competence.

Finally, the article suggests that the central challenge for teacher education is no longer simply deciding whether AI should or should not be used in classrooms. In many ways, that debate has already been overtaken by reality. The more urgent question concerns how future teachers can integrate these technologies critically, ethically, and pedagogically while preserving meaningful forms of human interaction, reflective learning, and intellectual autonomy within educational practice.

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