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ARTICLE / ARTÍCULO

Creating AI Applications for EFL Teaching: Perceptions and Challenges in Initial Teacher Education

Crear aplicaciones con IA para enseñar inglés: percepciones y desafíos en formación inicial docente

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Abstract: The dimension of “creating” with artificial intelligence (AI), proposed by UNESCO as an advanced level of AI literacy, remains underexplored in the field of initial teacher education (ITE), particularly in English as a foreign language (EFL) teaching. In this context, the present study aimed to analyze pre-service English teachers’ perceptions of the pedagogical possibilities and difficulties associated with creating educational applications using generative AI (GenAI) through Gemini 3.0. The participants were 51 English Pedagogy students from three Chilean public universities. The study adopted a qualitative approach through an online form, and the data were analyzed using inductive content analysis based on Krippendorff’s model, with the assistance of two large language models and human supervision. The results were organized into five categories: the pedagogical potential of AI for English language learning, the creation of educational applications, the new role of the pre-service teacher, new competencies and challenges in the use of AI, and the appropriation of the experience. However, an important finding was the identification of specific training gaps: prompt formulation emerged as a didactic competence rather than a technical one, and the greatest difficulty lay in translating pedagogical intentions into clear instructions. The experience also transformed pre-service teachers’ self-perception, as they came to see themselves as creators of educational technology. It is concluded that initial teacher education must shift the focus from the tool to the pedagogical problem, preparing teachers as learning sequence designers who create, adapt, and critically evaluate AI-powered resources.

Keywords: Artificial Intelligence, English as Foreign Language, Pre-service Teachers, Educational Technology, Technology uses in Education.

Resumen: La dimensión de «crear» con inteligencia artificial (IA), propuesta por la UNESCO como nivel avanzado de alfabetización en IA, está poco explorada en el ámbito de la formación inicial docente (FID), especialmente en el área de la enseñanza del inglés como lengua extranjera (ILE). En este contexto, el presente estudio tuvo como objetivo analizar las percepciones de futuros docentes de inglés sobre las posibilidades pedagógicas y las dificultades asociadas a la creación de aplicaciones educativas con IA generativa (IAGen) utilizando Gemini 3.0. Participaron 51 estudiantes de Pedagogía en Inglés de tres universidades públicas chilenas. La investigación adoptó un enfoque cualitativo mediante la aplicación de un formulario en línea, y los datos fueron analizados mediante un análisis de contenido inductivo basado en el modelo de Krippendorff, con asistencia de dos modelos de lenguaje de gran escala y supervisión humana. Los resultados se organizaron en cinco categorías: potencial didáctico de la IA para el aprendizaje del inglés, creación de aplicaciones educativas, nuevo rol del futuro docente, nuevas competencias y desafíos en el uso de la IA. No obstante, un hallazgo importante fue la identificación de vacíos formativos concretos: la formulación de prompts emergió como una competencia didáctica, no técnica, y la mayor dificultad radicó en traducir intenciones pedagógicas en instrucciones claras. La experiencia también transformó la autopercepción de los futuros docentes, quienes se reconocieron como creadores de tecnología educativa. Se concluye que la formación inicial docente debe desplazar el foco de la herramienta al problema pedagógico, preparando a los profesores como diseñadores de secuencias de aprendizaje que crean, adaptan y evalúan críticamente recursos con IA.

Palabras-clave: Inteligencia artificial, Inglés como lengua extranjera, Futuros docentes, Tecnología educativa, Usos educativos de la tecnología.

1. Introduction

Given the changes brought about by the emergence of GenAI in university classrooms, from methodologies to institutional policies (An et al., 2025; Cacho, 2024), it is necessary to investigate how these tools are currently being integrated into the curriculum for the preparation of pre-service teachers of English as a foreign language (EFL). Although the influence of computer-assisted language learning (CALL) has been studied since the 1960s and 1970s (Patahuddin et al., 2024), followed later by intelligent computer-assisted language learning (Weng & Chiu, 2023), the current scenario poses different challenges. GenAI far exceeds the possibilities of earlier intelligent tutoring systems, both because of its greater processing capacity and because of the possibility of interacting through natural language. This shift marks a turning point in teacher education, as it expands the ways in which pre-service teachers can design, adapt, and evaluate learning experiences. In this context, it is essential to analyze the challenges faced by ITE in relation to these technologies, as well as to define educational policies aimed at developing AI competencies that consider their technical, pedagogical, ethical, and human dimensions (Miao et al., 2021).

To guide this study, the following research questions were posed:

- RQ1. How do pre-service English teachers perceive the pedagogical possibilities of AI for creating applications aimed at EFL teaching?
- RQ2. What difficulties do they face during the process of creating educational applications with GenAI?

Answering these questions contributes to the discussion on the role of GenAI in initial teacher education, especially in relation to the transition from the instrumental use of digital tools to the creation of interactive resources with pedagogical intentionality. In addition, the study provides situated evidence on a still-emerging practice in the Latin American context: the use of generative AI to prototype educational applications aimed at learning English as a foreign language.

The purpose of this study is to generate findings that contribute to strengthening initial teacher education in English, particularly in relation to pre-service teachers' familiarization with GenAI tools. In this case, the activity focused on the use of Google Gemini 3.0 to create educational applications aimed at solving learning difficulties identified by the ITE students themselves.

1.1. *The New Role of the Teacher in the Age of AI*

UNESCO defines AI competence as the knowledge, skills, values, and attitudes that people need to develop to integrate AI effectively and ethically into educational processes (Ahmad et al., 2025).

The AI Competency Framework for Teachers (AI-CFT) defines the principles, values, knowledge, and critical skills teachers need to understand the role of AI and use it ethically, effectively, safely, and responsibly (Miao & Cukurova, 2025). The framework warns that formal education tends to respond reactively to the widespread adoption of AI across all areas of human development. It therefore proposes a paradigm shift, in

which public education is not a space of passive adoption but rather a means of empowering future leaders who can shape AI (Mikeladze et al., 2024; Zainuddin et al., 2025). UNESCO proposes three levels of progression in the AI-CFT: acquire, deepen, and create. Together, these levels show that teachers' professional development begins with a basic understanding of AI, advances toward its responsible and pedagogical use, and culminates in the ability to transform educational practice through creation with AI.

In the present study, the "create" level is especially relevant because it allows for an analysis of the transition from the functional use of AI tools to AI-mediated pedagogical design practices (Bai, 2025; Dou & Zhao, 2025) (see Figure 1).

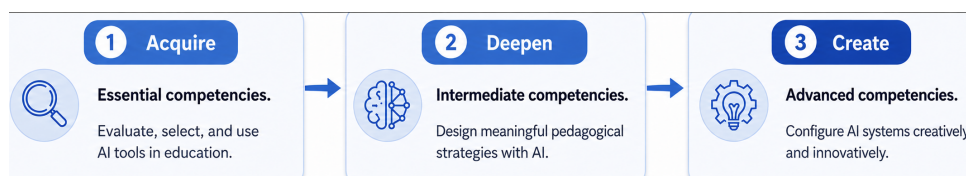


Figure 1. Levels of AI competence for teachers according to UNESCO's AI Competency Framework for Teachers (AI-CFT).

This framework also includes five domains: human-centered mindset, AI ethics, foundations and applications, AI pedagogy, and professional development (Chiu et al., 2025). In each domain, teachers move from initial knowledge and the basic use of tools toward a critical and ethical integration of AI aimed both at improving students' learning and transforming their own practice.

1.2. The New Role of the Student in the Age of AI

UNESCO has also developed an AI Competency Framework for Students (AI-CFS) with the purpose of guiding education systems in defining what students should know, value, and be able to do in relation to AI (Miao et al., 2025). Recent research is beginning to apply and validate this framework across different countries, educational levels, and disciplines.

This framework organizes learning around four dimensions: a human-centered mindset, AI ethics, foundations, techniques, and applications of AI system design (Wang et al., 2026). Each of these domains includes progression stages that move from initial understanding to the creation of AI-based solutions. This progression is structured across three levels: understand, apply, and create, which makes it possible to visualize the development of increasingly complex, critical, and productive AI literacy.

This idea of progression is relevant to the present study because the participants occupy a dual position: they are university students and, at the same time, pre-service English teachers. Therefore, the experience of creating applications with AI can be interpreted both as an AI literacy activity for students and as an initial pedagogical design practice for their future professional performance.

Beyond the instrumental use of AI tools, the AI-CFS proposes that students develop the capacity to act with autonomy, responsibility, and ethical awareness. In addition, they should understand the foundations of AI, apply it in concrete situations,

and advance toward the creation of tools or solutions through processes of design, testing, feedback, and continuous improvement.



Figure 2. Levels of AI competence for students according to UNESCO's AI Competency Framework for Students (AI-CFS).

Figure 2 illustrates the three-level progression that guides the development of students' AI literacy, moving from the recognition of foundations to the design and improvement of AI-based solutions through continuous feedback processes.

Recent studies show that students tend to adopt AI more frequently and experimentally than educators, particularly for autonomous learning, brainstorming, and overcoming language barriers (Chan & Hu, 2023; Wang & Li, 2024). Educators, by contrast, tend to be more cautious and express concerns about academic integrity, the quality of generated content, and its pedagogical relevance (Francis et al., 2025).

In conclusion, the AI-CFT and AI-CFS coincide in emphasizing that both teachers and students should be able to use AI to create. This means moving away from a passive use of AI and toward active improvement and involvement in the teaching and learning process (Zhao et al., 2026).

1.3. Creation of Personalized Instructional Material

To move from UNESCO's global vision to the practical reality of the classroom, it is necessary to understand that the advanced competence of "creating" with AI requires a profound change in the self-perception of both in-service and pre-service teachers. This change involves moving from the role of mere "consumers of digital resources" toward that of "creators of educational technology." However, this level of competence only becomes meaningful when it is translated into concrete classroom decisions: what to design, for whom, with what objective, and according to which pedagogical criterion.

The creation of instructional materials by teachers is an activity that must be continuously planned and implemented in order to guide students' learning process. Since the pandemic, teachers were forced to integrate digital technologies rapidly, without prior training and through trial-and-error processes. This situation led them to learn, almost in real time, how to teach online, use virtual platforms, and devote a significant amount of time to preparing instructional support resources (Ramakarsinin et al., 2022). In this context, GenAI emerges as an alternative for responding to these demands, since it can support both the production of resources and the design of activities more closely aligned with students' needs.

GenAI can help produce personalized multimodal materials (text, images, audio, and videos), reducing teachers' workload in preparation and correction (Ruiz-Rojas et al., 2023; Yuan et al., 2025). It can also support students' learning process by creating

adaptive lessons and assessments, allowing greater flexibility by adjusting content to each participant's level of progress (Pesovski et al., 2024).

The creation of educational applications through GenAI is not merely a technical activity, but a complex pedagogical practice that requires pre-service teachers to translate learning needs into instructions, prototypes, activities, feedback mechanisms, and criteria for didactic adequacy. Consequently, prompting is not understood merely as a technical skill for communicating with a tool, but as an emerging didactic competence (Federiakin et al., 2024). Formulating a prompt to create an educational application involves defining learning objectives, anticipating students' characteristics, selecting linguistic content, deciding types of interaction, and anticipating forms of feedback. From this perspective, the quality of the generated product depends both on the tool used and on the pedagogical judgment of the pre-service teacher.

Although many teachers use digital technologies in their educational practices, the creation of their own content remains one of the weakest areas of their digital competence (Kiryakova & Kozhuharova, 2024). This difficulty points to the need to strengthen formative experiences oriented toward the design and creation of digital educational resources with clear pedagogical criteria.

This same difficulty in creating one's own resources also extends to the field of artificial intelligence, where pre-service teachers' perceptions and attitudes play a key role in their willingness to integrate AI into the classroom.

1.4. Pre-Service Teachers' Perceptions of the Use of AI in EFL Teaching

Recent research in contexts such as Europe, Asia, and Latin America shows that pre-service teachers of English as a foreign language (EFL) perceive GenAI as a pedagogically useful tool, although they also recognize certain risks that require specific training and critical use (Pokrivcakova, 2023; Rebollo et al., 2025; Taşçı & Tunaz, 2024). In line with this trend, Harakchiyska's (2025) study in Bulgaria reveals that knowledge of AI and competence in teaching with the support of this technology are key indicators of pre-service teachers' readiness to integrate it into their future English classes, which evidences a favorable attitude toward its pedagogical adoption.

Nevertheless, although pre-service teachers show mostly positive attitudes toward the integration of AI into English teaching and consider that it can improve learning processes, they also recognize important limitations. These include their limited technical knowledge of AI, as well as the perception that they lack the skills and do not feel sufficiently competent to use it for pedagogical purposes (Derinalp & Halife, 2025; Harakchiyska & Vassilev, 2024). These shortcomings point to the urgent need to update teacher education curricula in order to foster consistent AI literacy among pre-service foreign language teachers, a change that requires the support of policymakers, university program designers, and teacher education providers.

Although the literature reports favorable attitudes toward AI and the need for training, there is still limited evidence on real creation experiences with GenAI among pre-service EFL teachers (Law, 2024). To help fill this gap, this study aimed to explore pre-service English teachers' perceptions of the pedagogical possibilities and challenges associated with an experience of creating educational applications with Gemini 3.0 GenAI for EFL teaching.

1.5. Study Context

The activity was carried out asynchronously within the framework of a broader formative experience on the use of AI to support academic writing in English. Following a pilot study conducted in 2024, the proposal was redesigned by incorporating a session focused on creating educational applications with GenAI. This implementation made it possible to observe how pre-service teachers transformed learning needs into objectives, didactic decisions, and instructions for the tool.

2. Methodology

The study adopted a qualitative design aimed at exploring pre-service English teachers' perceptions of creating educational applications with GenAI. The applications generated through Gemini 3.0 were understood as interactive digital teaching resources designed to support specific language skills.

2.1. Research Design

The study was framed within a qualitative design aimed at exploring pre-service English teachers' perceptions of the use of AI for creating educational applications. To analyze the evidence, the content analysis method based on Krippendorff's (1989) original model was used, adapted for application with AI assistance (Longo, 2020; Maj et al., 2025). As detailed in Section 2.4, this method made it possible to extract meaning from the textual corpus through a reliable, repeatable, and systematic process (Krippendorff, 2019).

2.2. Participants

The study participants were students of English Pedagogy as a foreign language, who were asked to generate applications using Gemini 3.0 and report on their experience. The study focused on an intentional and diverse sample, considering variables such as university of origin, gender, year of study, and level of English proficiency.

The final group consisted of 51 students from three Chilean public universities, anonymized as U1 (northern zone), U2 (central zone), and U3 (southern zone). It is important to note that this description serves a strictly contextual purpose; the study did not aim to conduct statistical comparisons based on these variables. To contextualize the sample, Figure 3 presents a descriptive characterization of the participants according to university of origin, gender, declared English level, and year of study.

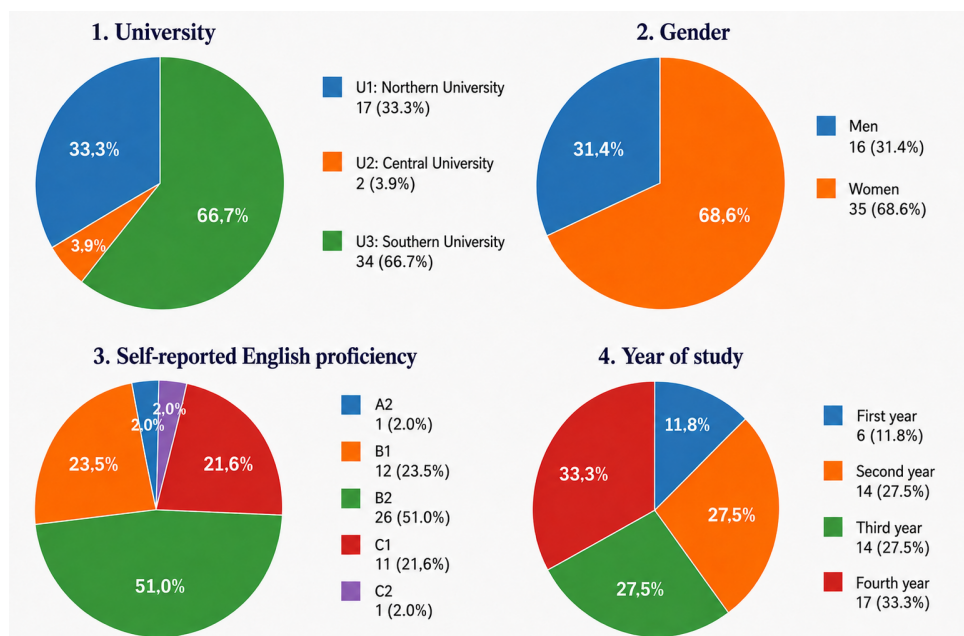


Figure 3. Profile of the study participants.

Figure 3 presents the distribution of the 51 pre-service English teachers according to university of origin, gender, declared English level, and year of study. These data are included for descriptive purposes to contextualize the sample, since the study did not aim to compare perceptions according to these variables.

2.3. Instrument and Data Collection Procedure

Data were collected using a structured activity and reflection form specifically designed for the training session. This form integrated informed consent, participant characterization data, step-by-step instructions for creating an educational application with Gemini Canvas, an instructional video, registration questions about the designed app, and a final open reflection section. In this final section, pre-service teachers could respond in English or Spanish to guiding questions about the pedagogical possibilities of AI, the difficulties faced during the process, and the possible use of these applications in real EFL teaching contexts. Since the form was not intended to measure a construct through standardized scales, but rather to guide a formative activity and collect open-ended perceptions, it was not subjected to a formal psychometric validation process; however, its design responded directly to the objectives of the session and the study's research questions¹.

2.4. Data Analysis Technique

The inductive content analysis followed Krippendorff's (1989) model. After an initial reading of the corpus, AI-assisted coding was carried out using two LLMs—ChatGPT 5.5 and Claude Sonnet 4.6—which analyzed the same anonymized corpus through a common prompt. The outputs generated were contrasted by the research team, which reviewed, merged, discarded, or reformulated categories according to their relevance

¹ The data used in this study are available in the following repository: <https://doi.org/10.5281/zenodo.20402853>

to the research questions. Therefore, the final analysis does not correspond to an automatic output, but to a human interpretation supported by AI (Jiang et al., 2025). This process of interpretive construction, which integrated the assistance of LLMs with the supervision of the research team, is illustrated schematically in Figure 4.

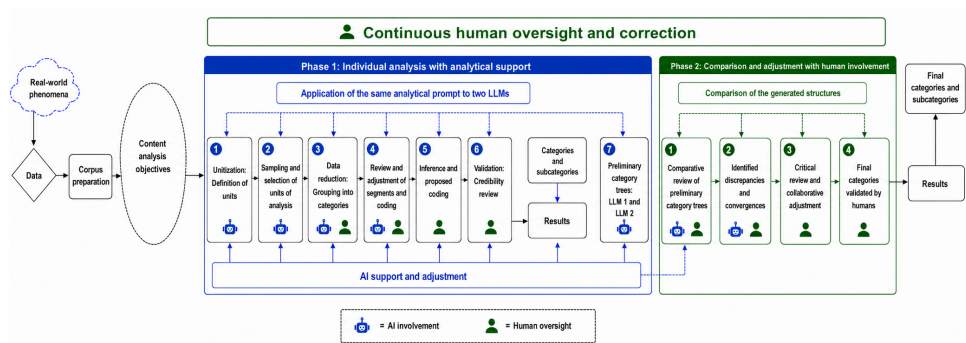


Figure 4. AI-assisted content analysis with human supervision based on the phases of Krippendorff's model.

Figure 4 describes the AI-assisted content analysis workflow, grounded in Krippendorff's (1989) classical methodology and complemented by the protocol for implementing generative AI proposed by Goyanes and De-Marcos (2025). The workflow is structured in six fundamental stages: unitization, sampling, data reduction, review and adjustment, inference, and validation (Phase 1).

To implement this workflow, the analysis was organized into a sequential seven-step procedure, which required two different types of instructions for the language models.

2.5. Prompts Given to the AI Tools

To carry out the content analysis and subsequently the comparison and triangulation of the data obtained, two prompts were created. The first was an analytical prompt and the second a comparative prompt².

2.6. Ethical Approval and Informed Consent

The favorable decision certified that the proposal complied with all corresponding methodological, ethical, and legal requirements, including the principles of good scientific practice, data privacy, confidentiality, and respect for human rights³.

3. Results

The content analysis made it possible to organize pre-service English teachers' perceptions into five main categories: the pedagogical potential of AI for English learning, the creation of educational resources and applications with AI, the

² Due to their length, the two prompts are available as an annex document in the following repository: <https://doi.org/10.5281/zenodo.20402522>

³ This research was approved by the ethics committee of the corresponding institution: <https://doi.org/10.5281/zenodo.20282219>

pedagogical role of the pre-service teacher in AI-based design, competencies and challenges for the use of generative AI, and appropriation of the experience and change in perception. Taken together, these categories show that creating applications with GenAI was not perceived merely as a technical activity, but as a formative experience that led participants to rethink the design of resources, the personalization of learning, and their own role as pre-service English teachers.

Table 1. Pre-service English teachers' perceptions of creating educational applications with AI.

Categories	Subcategories
1. Pedagogical potential of AI for English learning	1.1 Personalization and adaptation of learning 1.2 Immediate feedback and autonomous practice 1.3 Interactivity, motivation, and gamification 1.4 Contextualized and self-paced practice
2. Creation of educational resources and applications with AI	2.1 Creation of applications, games, and teaching resources 2.2 Design oriented toward real learning needs 2.3 Feasibility of use in real educational contexts 2.4 Accessibility for creating without knowing how to program
3. Pedagogical role of the pre-service teacher in AI-based design	3.1 Pedagogical decision-making 3.2 Definition of objectives, audience, and context 3.3 AI as support and not as a replacement for the teacher 3.4 Reconceptualization of the teaching role
4. Competencies and challenges for the use of generative AI	4.1 Formulation of prompts and precise instructions 4.2 Cognitive complexity of AI-based design 4.3 Technical difficulties, access, and functionality 4.4 Need for critical and reflective integration
5. Appropriation of the experience and change in perception	5.1 Surprise and discovery of new possibilities 5.2 Empowerment and teacher agency 5.3 Ease, speed, and time saving 5.4 Limited understanding, dependence, or need for guidance

The categories and sub-categories presented in Table 1 correspond to an interpretive synthesis developed by the research team based on the comparison of the two categorical trees generated by the two LLMs⁴.

⁴ Due to their length, they are published in the following repository: <https://doi.org/10.5281/zenodo.20402205>

Table 2. Examples of applications created.

No.	Content	Identification	Pedagogical characterization	Public link
13	Vocabulary	Code: U2-S2 App: Bug Buddies	Difficulty addressed: Academic vocabulary and pronunciation Audience: Elementary	https://gemini.google.com/share/b3831b5e983b
22	Pronunciation and phonetics	Code: U3-S14 App: TimeWise: Prepositions Trainer	Difficulty addressed: Grammar accuracy and usage (prepositions of time) Audience: University	https://gemini.google.com/share/7da580ebc46e
24	Listening comprehension	Code: U3-S15 App: Listening Master	Difficulty addressed: Listening practice Audience: Secondary	https://gemini.google.com/share/66ce5704f77a
27	Writing and production	Code: U3-S6 App: Stories to Life	Difficulty addressed: Grammar and vocabulary accuracy Audience: Elementary	https://gemini.google.com/share/c004a8def812
29	Oral communication and conversation	Code: U3-S1 App: FluentFlow	Difficulty addressed: Pronunciation, grammar, and vocabulary use Audience: Adult	https://gemini.google.com/share/dddc6c50428c
32	Exam preparation	Code: U3-S18 App: LexiconC1	Difficulty addressed: Acquiring and actively using advanced C1 vocabulary Audience: University / Secondary	https://gemini.google.com/share/669426e4cc18
34	Multicompetence / integrated	Code: U1-S7 App: LingoQuest	Difficulty addressed: Grammar, vocabulary, and communication Audience: Mixed	https://gemini.google.com/share/b005b28371b5

Table 2 groups the main categories on which students focused when creating the apps. Each record includes an identification, a brief pedagogical characterization, and the public link to the application. Overall, the table evidences the diversity of solutions designed by the participants, who not only generated interactive digital resources but also oriented their applications toward concrete needs in English learning, such as academic vocabulary practice, grammatical use, listening comprehension, written production, or oral interaction. This reinforces the idea that the activity of creation with AI fostered a practical approach to AI-mediated didactic design⁵.

⁵ Although not all digital products generated by the pre-service teachers remained available through functional public links, an annex repository has been made available at <https://doi.org/10.5281/zenodo.20367815>, which includes access to 34 applications, the prompts used to create them, and their linguistic level.

4. Discussion and Conclusions

A relevant contribution of this study is that it made it possible to empirically verify that the creation of educational applications with GenAI is not limited to a positive evaluation of the tool but rather enables the identification of concrete training gaps in ITE. The results offer a useful diagnosis for university English Pedagogy programs, showing which competencies need to be strengthened so that pre-service teachers can move from an instrumental use of AI toward more advanced instructional design practices.

The findings are characterized by a progression from instrumental uses of GenAI toward more complex practices of design, creation, and evaluation of educational resources. This shows that AI was resignified by the participants as a tool for pedagogical production. However, this possibility depends on emerging competencies related to prompt design, the definition of pedagogical objectives, the selection of relevant functions, and the critical supervision of the products generated.

The study dialogues with international AI competency frameworks, while also contributing a situated perspective from Latin American ITE, where technological innovation must be analyzed alongside conditions of access, cultural relevance, teacher agency, and ethical and pedagogical criteria for creating with AI.

Based on the five findings organized in Table 1, the study suggests that ITE should move from a tool-centered approach toward an approach centered on the pedagogical problem. It is not enough to tell students: “here is the tool, learn how to use it”; it is more formative to ask: “what pedagogical problem can you solve with it?” This shift in focus makes it possible to prepare pre-service teachers as designers of learning sequences who can create, adapt, review, and evaluate digital resources with pedagogical meaning.

The results show a predominantly positive perception regarding the pedagogical possibilities of AI for creating English-learning applications. Participants valued the possibility of designing resources adapted to specific needs, “the personalization of learning, immediate feedback, and the creation of more dynamic activities” (U3-S3). This finding is consistent with recent literature that highlights the potential of GenAI to support personalization, feedback, and more flexible learning experiences (Law, 2024; Pesovski et al., 2024; Weng & Chiu, 2023). However, the specific contribution of this study lies in the fact that it does not analyze only the use of AI by students to learn English, but rather the experience of pre-service teachers creating educational applications. This makes it possible to observe a more complex dimension: AI not merely as support for learning, but as a mediator of didactic design.

Table 2 shows that participants did not create applications in a generic way, but rather oriented them toward specific difficulties: academic vocabulary, grammatical use, listening comprehension, writing, oral communication, exam preparation, and the integrated development of skills. The audiences were diverse (elementary, secondary, university, and adult learners). This demonstrates that the activity required pre-service teachers to make deliberate initial pedagogical decisions about what difficulty to address, for whom to design, and what type of support to provide.

A particularly relevant aspect is that the experience enabled some participants to recognize themselves as potential creators of educational technology. The statement “I do not need to be a professional software engineer to create interactive learning tools; I can move from being a textbook reader to a creator of personalized applications” (U3-S14) evidences a transformation in professional self-perception. This resonates with teacher AI competency frameworks, which emphasize the need to prepare teachers who can understand, apply, and critically evaluate these technologies. However, the findings allow this idea to be nuanced: developing AI competence does not only mean knowing how to use tools but also learning to make deliberate pedagogical decisions with them.

Regarding the difficulties faced during the creation process, the results show that the challenges were not exclusively technical. One central difficulty was prompt formulation. Some participants stated that the most complex part was providing appropriate instructions so that the tool would generate the expected application: “The most difficult thing was understanding how to give the prompt and how to make Gemini create the page” (U3-S5). This shows that interaction with AI requires a specific competence: translating a pedagogical intention into clear, contextualized, and actionable instructions. The findings also invite us to problematize the idea that AI “facilitates” the creation of resources. Although these tools reduce technical barriers, they do not eliminate the need for pedagogical knowledge. On the contrary, they can make the lack of didactic clarity more visible when instructions are vague or when the learning purpose is not sufficiently defined.

At this point, some responses require nuanced interpretation. A student’s statement that “AI did all the work” should not necessarily be read as uncritical delegation, but rather as evidence of perceived efficiency: the pre-service teacher formulated a clear prompt, AI responded as requested, and the product matched the initial idea. From this perspective, agency does not disappear; rather, it shifts from technical execution to the pedagogical definition of the resource, the formulation of instructions, and the validation of the result. Nevertheless, an important tension exists: if creation with AI is reduced to requesting a product without critical review, there is a risk of superficial appropriation. It is necessary to distinguish between uncritical delegation and the intentional use of AI as support for educational design. The formative value lies in the pre-service teacher’s ability to identify learning needs, formulate didactic proposals, guide AI through relevant instructions, and evaluate whether the product responds to the pedagogical purpose.

Technical and access-related difficulties must also be considered. Some participants pointed to limitations related to the functioning of the tool or access to certain functions. This aspect is relevant because it shows that the integration of generative AI into teacher education depends not only on individual motivation or competence, but also on material and institutional conditions. In Latin American contexts, this dimension is especially important, since access gaps can significantly affect the pedagogical appropriation of emerging technologies.

In terms of implications, the results suggest that ITE should incorporate guided experiences of creation with AI, but not as merely instrumental activities. Creating an application with AI can be an opportunity to develop competencies in didactic design, critical thinking, creativity, and pedagogical evaluation. To this end, it is necessary to teach pre-service teachers to identify learning needs, formulate objectives, construct

contextualized prompts, review the quality of generated products, and reflect on the ethical and pedagogical limits of these tools.

Among the limitations of the study, it should be noted that the data are based on participants' self-reported perceptions; therefore, it is not possible to affirm that the applications created had a direct effect on English learning. Likewise, the positive evaluation of the experience does not guarantee that the products are pedagogically sound. It should also be considered that the experience was conditioned by the characteristics of the tool used and by possible restrictions in access or functionality. Finally, not all generated applications remained available through functional links, which may limit a complete analysis of the products created. Although diverse, the sample is small ($N = 51$) and limited to three Chilean universities, which restricts the transferability of the results. The asynchronous nature of the activity and the absence of direct observation by a teacher prevented the recording of difficulties in real time. In addition, a novelty bias is possible, since the experience was unprecedented for most participants.

Based on these results, future research could evaluate the pedagogical quality of the applications created by considering criteria such as alignment with learning objectives, appropriateness to linguistic level, relevance of feedback, accessibility, interactivity, and didactic coherence. It would also be relevant to implement these applications with real English learners in order to analyze their impact on motivation, autonomous practice, and learning. Likewise, different generative AI tools could be compared to identify differences in usability, teacher control, and the quality of generated products.

The main contribution of this study is not based solely on showing that pre-service teachers perceive their experience with generative AI positively, but on evidencing that the creation of educational applications with AI constitutes a complex formative practice that articulates creativity, pedagogical design, digital competence, ethical judgment, and disciplinary knowledge of English. Future research could evaluate the pedagogical quality of the applications created, implement them with real students, and compare different GenAI tools in terms of usability, teacher control, and didactic relevance in diverse Latin American contexts.

5. References

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