

Exploring Pre-Service Teachers' Perceptions Regarding the Implementation of AI in Language Learning

Explorando las percepciones de los profesores en formación sobre la implementación de la IA en el aprendizaje de lenguas

ABSTRACT: This quantitative descriptive study explored pre-service English teachers' perceptions of AI integration in a language teacher training program in northern Mexico. This context remains underexplored in the literature. Nine-ty-six fourth-semester students enrolled in the Applied Linguistics to Teaching and Translation program at a public university in Nuevo Leon completed a validated 18-item Likert-scale survey (Cronbach's $\alpha = 0.71-0.85$) during the August–December 2024 semester. The instrument examined three dimensions: (1) AI awareness and knowledge, (2) AI integration within the training program, and (3) perceived benefits of AI for productive skills development. Descriptive statistical analysis revealed that participants held generally positive perceptions of AI's potential ($M = 3.82$), with 42.7% agreeing that AI supports the development of speaking fluency, writing accuracy, and personalized feedback. However, participants expressed notable uncertainty regarding actual AI integration in their program ($M = 3.01$), with 43.8% unsure whether their professors effectively modeled AI-based pedagogical practices. These findings suggest that while pre-service teachers recognize AI's instructional value, current training programs may not be systematically or effectively incorporating AI tools. Faculty professional development and the integration of AI-focused courses into the Applied Linguistics curriculum are recommended.

KEYWORDS: Artificial Intelligence in Education (AIED), Pre-service English Teachers, Language Teacher Education, AI Integration, Productive Skills

RESUMEN: Este estudio cuantitativo descriptivo exploró las percepciones de docentes de inglés en formación sobre la integración de la IA en un programa de formación docente en el norte de México, un contexto poco explorado en la literatura. Noventa y seis estudiantes de cuarto semestre de la licenciatura en Lingüística

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Aplicada a la Enseñanza y Traducción en una universidad pública de Nuevo León completaron una encuesta validada con una escala Likert de 18 ítems (α de Cronbach = 0.71–0.85) durante el semestre agosto-diciembre de 2024. El instrumento examinó tres dimensiones: (1) conciencia y conocimiento sobre la IA, (2) integración de la IA en el programa de formación y (3) beneficios percibidos de la IA para el desarrollo de habilidades productivas. El análisis estadístico descriptivo reveló que los participantes mantenían percepciones generalmente positivas sobre el potencial de la IA ($M = 3.82$), con un 42.7% de acuerdo en que la IA apoya el desarrollo de la fluidez oral, la precisión escrita y la retroalimentación personalizada. Sin embargo, los participantes expresaron una notable incertidumbre respecto a la integración real de la IA en su programa ($M = 3.01$), con un 43.8% de ellos inseguro sobre si sus profesores modelaban eficazmente prácticas pedagógicas basadas en la IA. Estos hallazgos sugieren que, aunque los docentes en formación reconocen el valor instruccional de la IA, los programas actuales podrían no estar incorporando herramientas de IA de manera sistemática ni efectiva. Se recomienda el desarrollo profesional del profesorado y la integración de cursos centrados en IA en el currículo de Lingüística Aplicada.

PALABRAS CLAVE: Inteligencia Artificial en la Educación (IAED), Docentes de inglés en formación, Formación docente en lenguas, Integración de la Inteligencia Artificial, Habilidades productivas

Introduction

The rise of artificial intelligence (AI) has influenced various sectors, and education is not the exception. In the last decade, this technological resource has evolved exponentially, leading to AI-powered tools that have significantly impacted language teaching and learning (Lucas et al., 2023). AI appears to be an important element in improving receptive and productive skills in the language learning process. In this sense, AI-powered tools serve as a powerful aid to prepare English language teachers to reach international language proficiency levels.

Recent research findings have shown different perspectives about the implementation of AI-powered tools to improve English language skills (Alkalan, 2024). Teachers expressed feeling positive about the AI implementation in language courses since this provides feedback tailored to each student's needs and individualized learning. Ayala-Pazmiño and Alvarado-Lucas' (2023) research found that teachers in English training programs perceive the integration of AI as positive. Findings converge with those of Alkalan's (2024), highlighting the provision of personalized feedback to improve language proficiency. However, there are aspects perceived as negative, such as those related to human interaction and emotional support. Additionally, Alkalan's (2024) study found that language teachers perceive the lack of access to AI, potential job displacement, ethical implications, and the loss of higher-order thinking skills such as critical thinking as negative. Both studies (Ayala-Pazmiño & Alvarado-Lucas, 2024; Alkalan, 2024) converge in the need to urge education stakeholders to change the educational policies about the integration of AI in the preparation programs for language teachers and in the training teachers' programs policies.

Some of the AI-powered tools offered interactive exercises to reinforce receptive and productive skills. According to research (Edmett et al., 2024), more than one thousand English teachers agreed on the benefits that AI-powered tools have for improving receptive

and productive skills in English language learners' learning process. Among the benefits of the integration of AI-powered tools that English teachers perceive as positive are: (1) engaging activities, (2) immediate and personalized feedback, (3) adaptation to students' English level, (4) enhanced autonomous learning, and (5) non-judgmental feedback (Davila et al., 2024; Lucas et al., 2023). Among the challenges English teachers perceive as negative when learners use AI-powered tools are: (1) technology access, (2) lack of human reactions, and (3) the fear of students overusing AI. According to Zainuddin (2024), AI-powered tools offer benefits that can improve the English language learning process; however, teachers believe that a balance between AI-powered tools and traditional instructional methods is recommended.

The preparation of future English teachers in language teacher training programs carries a specific and demanding linguistic requirement: pre-service teachers are expected to reach advanced levels of English language proficiency, encompassing all four skills, including the productive skills of speaking and writing, as a condition of program completion. In Mexico, this expectation is explicit: Zumarraga et al. (2024) note that English teacher training programs in Mexican universities prepare graduates who are expected "to be fully bilingual" (p. 81), meaning they must demonstrate competence in listening, reading, writing, and speaking to meet program exit requirements. It is precisely in this context—where productive skill development is not optional but a graduation requirement—that the integration of AI-powered tools becomes strategically relevant. If AI can support pre-service teachers in reaching the proficiency levels their programs demand, then understanding how those teachers perceive AI becomes an essential first step toward effective implementation.

The specific proficiency benchmarks pre-service teachers must meet are defined by the Common European Framework of Reference for Languages (CEFR). Internationally, a C1 level is commonly established as the exit standard in English teacher training programs (Ayala-Pazmiño & Alvarado-Lucas, 2023). In the Mexican context, however, there is no national standardized guideline governing the proficiency level pre-service English teachers must demonstrate upon graduation (Castillo-Nava & Mora-Pablo, 2022). As a result, institutions establish their own requirements: Polytechnic and Technological Universities, as well as programs at the Autonomous University of Nuevo Leon, set a B2 level as their exit requirement, while the Philosophy and Arts School at the same institution requires pre-service teachers to reach C1. Regardless of the specific benchmark, both standards demand sustained development of productive skills throughout the training program. This makes the exploration of AI tools that can support speaking and writing development not merely an academic interest but a practical necessity for programs seeking to ensure their graduates meet professional readiness standards.

Benefits and challenges have been found in recent research regarding the integration of AI in English teachers' preparation programs (Ayala-Pazmiño & Avarado-Lucas, 2023; Godwin-Jones, 2022; Uwosomah & Dooly, 2025; Huang et al., 2023) but little has been

done to know about pre-service English teachers' perceptions about the integration of AI to improve their own language learning process in terms of productive skills in the tertiary level of education in an English Language Teachers Preparation program in Northern Mexico. This investigation aims to explore pre-service English teachers' perceptions about the integration of AI to improve productive skills in the Applied Linguistics program in a public university in Northern Mexico.

Exploring pre-service teachers' perceptions about topics like AI integration into their training program helps inform curricular decisions that can validate changes in their training program. This paper explores pre-service English teachers' perceptions about (a) AI awareness and knowledge, (b) perceived AI implementation within their training program, and (c) perceived benefits of AI on productive skills. AI might become an assistant that serves in two ways: on one hand, to develop productive skills, and on the other, to adapt strategies that they might implement in their own teaching practice.

Research questions guiding this study are as follows:

1. What are English preservice teachers' perceptions toward the integration of AI-powered tools to improve their language skills?
2. What are English preservice teachers' perceived benefits of AI for English language learning?
3. To what degree do pre-service teachers believe AI tools are currently integrated into their teacher training program?

Literature Review

Perceptions in Education

Understanding how teachers and future teachers perceive educational innovations is essential for evaluating the likelihood of their adoption and sustained use in practice. In educational research, perceptions refer to the cognitive and affective interpretations individuals construct about a phenomenon based on their prior knowledge, experiences, and contextual exposure (Bandura, 1986; Pajares, 1992). These interpretations are not neutral; they shape attitudes, decisions, and ultimately practice. In the context of technology integration, teachers' perceptions of usefulness and ease of use have been identified as primary predictors of adoption behavior (Wang et al., 2023). In this study, pre-service teachers' perceptions are examined across three dimensions: their awareness and knowledge of AI, their perception of AI's integration within their training program, and their perceived benefits of AI for productive skills development. Examining these perceptions is particularly relevant because pre-service teachers are at a formative stage in which beliefs about technology can become entrenched and carry forward into their future professional practice (Pokrivčáková, 2023; Zhang et al., 2023).

Artificial Intelligence in Language Education

Artificial Intelligence (AI) is becoming a transformative tool across multiple areas. As Fitria (2021) points out, AI systems can act like humans through different programs, changing fields like education, especially how languages are taught and learned, including language processing, adaptive feedback, and pattern recognition. Pokrivčáková (2023) also identifies four key ways in which AI can change education. AI can help switch from old teaching methods to innovative instructional methods, enabling teachers to learn through data-informed adaptation to individual students' profiles, reducing administrative burdens so that teachers can invest more time in creative pedagogical design, and broadening access to learning resources across diverse student populations. However, the extent to which these benefits are implemented in practice depends substantially on how teachers and pre-service teachers perceive both the AI tools' benefits and the institutional conditions surrounding their use (Wang et al., 2023). This makes the study of AI perceptions toward the use of AI tools not merely descriptive but strategically relevant for educational curricular changes.

In-Service Teachers' Perceptions of AI

A growing body of research has examined in-service English teachers' perceptions of AI integration, consistently finding that perceptions are mixed and context-dependent. Lucas et al. (2023) surveyed English teachers and found generally positive dispositions toward AI adoption; however, participants emphasized the need for structured guidance and professional training as prerequisites for effective integration. This finding underscores that positive perceptions alone do not translate into classroom implementation without institutional support.

Lazzat (2024) conducted a mixed-methods study in which teachers reported favorable perceptions of AI-powered tools—including language learning applications, grammar checkers, and pronunciation correction software—particularly valuing the time saved on routine tasks and the ability to redirect that time toward creative instructional design. Nevertheless, participants also expressed concern about the risk of technology dependence and the potential erosion of the teacher's role in the learning process, reflecting ambivalent perceptions that are common across the literature (Fitria, 2021; Lucas et al., 2023).

Alkalan (2024) and Ayala-Pazmiño and Alvarado-Lucas (2023) both found that teachers perceive personalized feedback as one of the most valued affordances of AI. Conversely, both studies identified shared concerns regarding limited access to technology, ethical implications of AI use, potential displacement of professional roles, and the risk of diminishing higher-order thinking skills such as critical thinking. Zainuddin (2024) similarly found that while teachers view AI as beneficial for student engagement in English language learning, they advocate for a balanced approach that preserves traditional instructional methods alongside AI-enhanced activities.

Pre-Service Teachers' Perceptions of AI

Pre-service teachers represent a particularly important population for studying AI perceptions because their beliefs and attitudes are still forming and are susceptible to influence through teacher education programs (Zhang et al., 2023). Research on pre-service teachers' perceptions of AI has expanded notably in recent years, reflecting growing recognition that future teachers must be prepared not only to use AI tools but also to evaluate their pedagogical value critically.

Pokrivčáková (2023) found that pre-service EFL teachers hold cautiously positive attitudes toward AI, recognizing its potential while expressing uncertainty about practical implementation. Bae et al. (2024) explored pre-service teachers' dual perspectives on generative AI, finding that participants simultaneously acknowledged benefits—such as lesson planning support and individualized feedback—and challenges, including academic integrity concerns and overdependence on technology. Karina and Kastuhandani (2024) documented how pre-service English teachers described their lived experiences using AI during teaching preparation, revealing both enthusiasm for AI as a planning tool and discomfort stemming from limited training and unclear institutional guidelines.

Uwosomah and Dooly (2025) followed pre-service teachers' evolving perceptions over time, finding that initial apprehension about AI gave way to more nuanced and constructive views as participants gained hands-on experience. This trajectory suggests that perceptions are not static—they can shift meaningfully through exposure, training, and reflective practice, further supporting the need to understand and address pre-service teachers' perceptions during their formative training years.

AI and the Development of Productive Skills

Research investigating AI's specific impact on productive language skills—speaking and writing—has reported consistently encouraging findings. Khoudri (2024) evaluated a series of AI tools designed to develop both receptive and productive skills, finding that learners considered these tools user-friendly and effective, particularly for improving writing accuracy and spoken fluency. Participants in that study also expressed willingness to continue using AI tools for language development. However, a minority still preferred traditional methods—a reminder that perceptions of AI effectiveness are not universally shared.

Edmett et al. (2024), in a large-scale study involving over one thousand English teachers, documented broad agreement about AI's benefits for skill development, identifying engaging activities, immediate and personalized feedback, adaptation to proficiency levels, promotion of autonomous learning, and non-judgmental correction as the most valued affordances. Lucas et al. (2023) and Davila et al. (2024) similarly found that AI tools positively impacted areas including pronunciation, grammar, vocabulary, and reading comprehension.

Despite this optimism, concerns persist. Teachers in multiple studies have raised issues around the lack of human emotional responsiveness in AI interactions, the risk of over-reliance diminishing learners' self-regulation, and the ethical dimensions of AI-generated

content (Karina & Kastuhandani, 2024; Rukiati et al., 2023). These concerns highlight that perceptions of AI's role in skill development are shaped not only by observable outcomes but also by deeper beliefs about the nature of language learning and the teacher's irreplaceable human role within it.

AI Integration in Language Teacher Training Programs

While individual teachers' perceptions of AI have been studied extensively, less attention has been paid to how pre-service teachers perceive AI's integration, or lack thereof, within their own training programs. This distinction matters because even when pre-service teachers hold positive general perceptions of AI, a disconnect between those perceptions and the institutional realities of their programs can create barriers to eventual professional use (Wang et al., 2023; Yetkin & Özer-Altinkaya, 2024).

Ayanwale et al. (2024) and Meylani (2024) have demonstrated that AI-powered platforms offer substantial potential for enriching teacher preparation programs by providing resources for curriculum design, lesson modeling, and differentiated instruction. Lucas et al. (2023) explicitly recommend integrating AI tools into pre-service teacher education as a dual-purpose strategy: to improve pre-service teachers' own language proficiency and to equip them with pedagogically sound AI-integration strategies for their future classrooms. Similarly, Carranza Alcantar et al. (2024) found that university teachers' perceptions of generative AI integration were generally positive, though they identified gaps in institutional training and policy as limiting factors.

In the Mexican context specifically, the absence of a national standardized framework for AI integration in teacher education (Castillo-Nava & Mora-Pablo, 2022) means that exposure to AI tools within preparation programs varies considerably across institutions. Pre-service teachers' perceptions of AI integration within their specific program context are therefore shaped not only by general knowledge of AI but also by whether their professors model its use and whether the curriculum explicitly addresses it. Understanding these situated perceptions is essential for designing training environments that move beyond awareness toward systematic, pedagogically informed AI integration.

Methodology

This quantitative descriptive study aims to explore pre-service teachers' perceptions about the implementation of AI to improve productive skills in a public university in northern Mexico. Ninety-six fourth-semester pre-service teachers, during the semester of August-December 2024, after giving their consent to participate in this study, were surveyed. The survey "Pre-service teachers' perceptions towards the implementation of AI in language learning" was made up of a demographic section constituted by ten items collecting personal and professional information; in the second section, eighteen Likert-type items were distributed in three different sections: (A) AI awareness and knowledge, (B) AI integration in the training program, and (C) AI applied to productive skills.

To establish validity, the survey was reviewed by two experts in language teaching and Artificial Intelligence research, both professors of a public university in Nuevo Leon, who evaluated the clarity and relevance of each item. The reliability of the instrument was assessed using SPSS software. Cronbach's alpha coefficients were calculated for each section of the survey. Section A demonstrated a coefficient of 0.71. Sections B and C showed coefficients of 0.85 and 0.79, respectively, indicating acceptable reliability for all three sections. Following the validity and reliability process, the instrument was administered to the fourth-semester pre-service teachers of the Applied Linguistics to Teaching and Translation of English program.

96 pre-service teachers completed the survey. Most participants (68%) were women, followed by 25% men and 7% who preferred not to say. Only 10% of the participants were working as English teachers at the time of the study, while 90% were not. 57% of participants had some experience using AI-powered tools. 86% of participants had access to technology, a computer, and an internet connection. Results of the statistical analysis are shown in the next section.

For the data analysis phase, a quantitative descriptive approach was employed to synthesize the perceptions of the 96 participants collected through the survey instrument. The questionnaire consisted of 18 items distributed across three analytical dimensions: Section A (7 items), Section B (5 items), and Section C (6 items). Each item was evaluated using a five-point Likert scale, allowing respondents to rate their level of agreement from "Strongly disagree" (1) to "Strongly agree" (5). This methodological design facilitated the transformation of qualitative responses into discrete numerical data for subsequent statistical processing.

The analysis procedure was conducted in two consecutive stages. First, relative frequencies were calculated as percentages for each of the five scale categories within each item. Second, to obtain the results presented in the table 'Summary of Averages by Section,' the mean of the percentages corresponding to each response category was calculated across all items within the same section. This dimension-based aggregation allowed for data cross-sectional comparisons among the three sections of the study, providing an overview of the predominant opinion trends (agreement, neutrality, or disagreement) within the studied population regarding each thematic axis."

Results

This section presents results obtained from the quantitative analysis run on the data across sections A, B, and C regarding preservice English teachers' perceived (a) awareness and knowledge about AI-powered tools, (b) potential benefits of AI integration to English language learning, and (c) AI-powered tools integration in their teacher training program. Table 1 summarizes the averages by section. The table shows the percentage obtained from the number of responses given by the n=96 participants in each category, which begins with *Strongly Disagree* (1), *Disagree* (2), *Neutral* (3), *Agree* (4), and *Strongly Agree* (5).

Table 1
Summary of averages by section (n=96)

Section	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Section A	3.60%	11.00%	35.80%	38.10%	11.50%
Section B	5.80%	20.70%	45.20%	26.30%	2.10%
Section C	10.70%	13.90%	35.10%	30.80%	9.60%

Preservice Teachers' AI Awareness and Knowledge

Results show that the highest average is in the *Agree* category at 38.1%, followed closely by *Neutral* at 35.8%. The total disagreement (*Strongly Disagree* and *Disagree* combined) is low, totaling only 14.6%. The data reveal that most participants show a favorable perception of the topics evaluated in this section. There is a consensus of approval, although a significant portion of the sample remains uncertain about their knowledge and awareness of AI tools' benefits. Some of the aspects surveyed in section A of the instrument revealed that tools like ChatGPT are recognized, though opinions vary on whether it is the only well-known AI tool. In summary, there is a consensus that AI can be easily integrated into the classroom environment.

Potential AI Benefits on English Language Learning

The results in this section indicate greater indecision or a lack of a clear stance among respondents. The dominant response is clearly *Neutral*, with an average of 45.2%. Total agreement (*Agree* 26.30% and *Strongly agree* 2.10%) reaches 28.4%, while total disagreement (*Disagree* 5.8% and *Strongly disagree* 20.70%) is 26.5%. The data suggests divided opinions or that the topics covered do not elicit a strong reaction. Since there is an almost exact balance between those who agree and those who disagree, combined with very high neutrality, it can be inferred that these aspects do not generate a definitive impact on the majority of participants. Hesitant responses are expressed regarding the extent of AI integration and its effective implementation by professors in the major. There is a clear split on whether all professors use AI, with a significant number of disagree responses, suggesting uneven adoption among professors in the major. Despite the neutrality in implementation, students tend to agree that available AI resources have been helpful for their development.

Perceived AI Integration in the Training Program

This section presents the most varied results and reveals specific points of contention. While the highest average is still *Neutral* (35.1%) and *Agree* (30.8%), there is notable po-

larization. Item 5 stands out, where 45.8% of participants reported being in the *Strongly Disagree* category, a figure significantly higher than any other item in the study. Although the general trend leans toward neutrality or agreement, there are critical elements (especially Item 5) that provoke strong rejection. This indicates that while the section is mostly accepted, it contains specific aspects perceived very negatively by a considerable portion of the studied population. Students positively value AI for improving speaking fluency and writing accuracy, highlighting its ability to provide personalized feedback. A critical finding is the strong rejection of the idea that AI should replace human teachers (a very high concentration of *Strongly Disagree* at 45.83%). Instead, the majority supports AI as a complementary tool (27.08%). There is a general perception that AI effectively assists in developing the productive skills of writing (42.70%) and speaking (42.70%), dismissing the idea that it is not helpful.

Conclusion

This study explored the perceptions of 96 pre-service English teachers regarding AI integration in their teacher training program, focusing on three dimensions: AI awareness and knowledge, perceived benefits for productive skills development, and AI implementation within their program. Findings reveal a consistent pattern: participants hold favorable perceptions of AI as a tool for language development, particularly for writing and speaking fluency, with personalized feedback emerging as the most valued AI benefit. Notably, participants rejected the notion of AI as a replacement for human educators, viewing it instead as a complementary instructional resource. However, perceptions of AI integration within their training program were less positive, characterized by high levels of neutrality and limited evidence of systematic faculty adoption, suggesting that institutional practice has not kept pace with student awareness and readiness.

These findings point to a clear implication: teacher training programs must move from incidental AI exposure toward structured, curriculum-wide integration. This includes standardizing AI tool use across courses and preparing faculty to model pedagogically sound AI implementation. These results are in line with those found in Lucas et al. (2023), which highlight the importance of integrating AI-powered tools into pre-service English teachers' preparation courses to support their subsequent teaching practice.

Recommendations

Based on the conclusions, the following recommendations are provided. First, it is recommended to provide the Applied Linguistics program faculty with professional development to model and teach the pedagogical application of AI to future English teachers. Professional development provided might help to move from occasional use to a more systematic and structured integration of AI-powered tools not only in some but across all relevant courses in the program. It is also recommended to enhance the Applied Linguistic Program curriculum with subjects specialized in the use of AI applied to language teaching and learning.

Further qualitative research is recommended to find reasons for the uncertain responses concerning AI benefits and program implementation and the lack of exposure to AI-powered tools. A quasi-experimental implementation is also recommended to measure the potential benefit of AI-powered tool implementation to improve language skills.

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