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# AI and machine learning in English teaching: A systematic review of acquired language competence

*IA y aprendizaje automático en la enseñanza del inglés: revisión sistemática sobre la competencia lingüística adquirida*

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## Abstract

Technological evolution is revolutionizing English teaching through the use of Artificial Intelligence (AI) and Machine Learning (ML), tools that allow the educational process to be personalized according to the individual needs of each student. These technologies facilitate interactive environments, automatic feedback, and adaptive platforms that enhance language skills, promoting a pedagogical reconfiguration that increases engagement, performance, and knowledge retention. This study was developed through a systematic review following the PRISMA approach, with a qualitative and documentary methodology. Based on the identification, analysis, and selection of 20 relevant academic studies, the opportunities, challenges, and trends related to the implementation of AI in various educational contexts were explored. The results show that AI and ML strengthen student autonomy and motivation, favoring more active and personalized learning processes. However, their full integration still faces significant structural barriers, such as limited connectivity, lack of teacher training, and insufficient curricular adaptation, especially in Latin American settings. In conclusion, while AI and ML offer great potential to transform English language teaching, addressing these challenges is critical to ensuring effective, equitable, and sustainable implementation in today's education systems.

**Keywords**: artificial intelligence, machine learning, English language proficiency.

## Resumen

La evolución tecnológica está revolucionando la enseñanza del inglés a través del uso de la Inteligencia Artificial (IA) y el Aprendizaje Automático (AA), herramientas que permiten personalizar el proceso educativo según las necesidades individuales de cada estudiante. Estas tecnologías facilitan entornos interactivos, retroalimentación automática y plataformas adaptativas que potencian las competencias lingüísticas, promoviendo una reconfiguración pedagógica que incrementa el compromiso, el rendimiento y la retención del conocimiento. Este estudio se desarrolló mediante una revisión sistemática siguiendo el enfoque PRISMA, con una metodología cualitativa y documental. A partir de la identificación, análisis y selección de 20 estudios académicos relevantes, se exploraron las oportunidades, desafíos y tendencias relacionadas con la implementación de la IA en diversos contextos educativos. Los resultados evidencian que la IA y el AA fortalecen la autonomía y la motivación de los estudiantes, favoreciendo procesos de aprendizaje más activos y personalizados. No obstante, su integración

plena aún enfrenta importantes barreras estructurales, tales como la conectividad limitada, la falta de capacitación docente y la insuficiente adecuación curricular, especialmente en escenarios latinoamericanos. En conclusión, aunque la IA y el AA ofrecen un gran potencial para transformar la enseñanza del inglés, es fundamental abordar estos desafíos para garantizar una implementación efectiva, equitativa y sostenible en los sistemas educativos actuales.

**Palabras clave**: inteligencia artificial, aprendizaje automático, competencia lingüística en inglés.

## Introduction

Technological development continually redefines educational processes, particularly influencing the teaching of foreign languages such as English. In this context, Artificial Intelligence (AI) and Machine Learning (ML) have emerged as innovative tools that enable the personalization of the educational process, adapting to the individual characteristics of each student. These technologies offer interactive environments, automated feedback, and adaptive platforms that adjust content according to personal progress, thereby facilitating continuous improvement in language competencies. Their implementation has gained particular significance in Latin American countries such as Ecuador, Mexico, and Bolivia, where new technological strategies are explored to optimize English language teaching at various educational levels.

The personalization of learning, driven by AI and ML, assumes a strategic role in English instruction, a key language for global communication and access to academic and professional opportunities. According to Roy et al. (2025), this personalization transforms the role of the teacher and restructures instructional design, allowing for greater adaptation to individual learning styles and paces. This goes beyond merely modifying content; it represents a pedagogical reconfiguration based on technology that enhances engagement, performance, and knowledge retention. However, fully integrating these technologies into educational environments requires overcoming structural barriers related to connectivity, teacher training, and curriculum adaptation, especially in Latin American contexts.

In countries such as Ecuador, Mexico, and Bolivia, the degree of incorporation of intelligent technologies varies considerably due to differences in technological access, institutional infrastructure, and AI-based teaching strategies. This review examines the current use of AI and ML in English language teaching in these countries, aiming to identify benefits, challenges, and future perspectives. As Posada and Garzón (2025) warn, educational innovation grounded in emerging technologies is only effective if accompanied by a coherent and sustainable pedagogical ecosystem.

The development of communicative competence in English is a strategic priority in Latin America, given its influence on employability and international integration. However, traditional methods do not always respond to the diversity of styles and individual needs of students. In this scenario, AI and ML technologies represent an opportunity to redesign the learning experience in a more personalized and effective manner, although their adoption faces technical, pedagogical, and structural barriers that vary between countries.

The transition to digital education is gaining prominence through policies that promote pedagogical and technological innovation. However, as Mera (2024) points out, the effectiveness of these transformations depends on the institutional capacity to ensure meaningful access and use of technologies. In Ecuador, limitations in infrastructure persist, especially in rural areas, and the lack of teacher training in AI restricts the utilization of personalized solutions, affecting equity and the quality of learning.

Advancements in educational digital platforms and hybrid models highlight the gradual transformation of the educational system. Nevertheless, according to Pérez et al. (2025), the effective implementation of emerging technologies requires not only infrastructure but also a profound didactic and formative reconfiguration of teachers. In Mexico, the integration of AI in English teaching is not yet consolidated due to the lack of pedagogical coordination and weak teacher training, which limits its impact on the development of language competencies.

Academic interest in educational innovation and emerging technologies continues to grow, although it faces multiple practical obstacles. In Bolivia, inequalities in digital access and limited public investment hinder the implementation of AI in language teaching. As Correa (2021) warns, without a structural framework that ensures sustainability and inclusion, technological policies tend to deepen existing gaps rather than mitigate them.

Historically, English teaching has relied on directive and uniform methods that prioritize the systematic transmission of content by the teacher. This approach limits adaptation to the diverse styles and paces of students. Rodríguez (2025) notes that in many Latin American contexts, teacher-centered approaches still prevail, making differentiated and contextualized attention challenging. This has spurred interest in innovative models that integrate emerging technologies to address the current challenges of language learning.


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With digital expansion, educational technologies are gradually being incorporated into foreign language teaching. Leonet et al. (2025) emphasize that these resources foster autonomy and enhance communicative practice in virtual environments, a key aspect for teaching English in multilingual and culturally diverse contexts.

In this regard, AI emerges as a tool with great potential to energize and personalize instruction. Lu (2022) argues that AI allows for the adaptation of content, sequences, and pedagogical strategies to individual characteristics, optimizing the acquisition of language competencies effectively and student-centeredly.

In Latin America, although various nations experiment with AI in education, Galindo et al. (2024) warn that structural barriers such as limited infrastructure and gaps in teacher training persist, affecting the equitable and sustained implementation of these innovations.

The communicative approach, promoted as an alternative to the traditional grammatical model, favors the development of functional language skills. However, Espejo (2024) clarifies that its effective implementation requires suitable pedagogical, technological, and curricular conditions, which are not always present, generating demand for technological strategies that expand interaction and contextualization.

Adaptive learning consolidates as a promising paradigm for personalizing instruction in digital environments. According to Ezzaim et al. (2023), adaptive systems adjust content and feedback according to progress, favoring more relevant and effective experiences in English teaching.

Gamification, for its part, is positioned as a strategy to increase motivation and engagement through playful dynamics. De la Peña and Chaves (2024) indicate that integrating game design enhances participation and stimulates cognitive processes essential for acquiring a second language.

Additionally, learning analytics enables a better understanding of student behavior. Bobro et al. (2025) argue that digital data analysis facilitates informed pedagogical decisions, personalizing content and monitoring, thereby strengthening teacher intervention.

Constructivist theory posits that knowledge is actively constructed through experiences and interaction. Vygotsky, cited by Jacovkis et al. (2022), emphasizes social learning and the mediating role of technology in facilitating knowledge construction, especially relevant in digital platforms for English teaching.

Sociocultural theory highlights interaction as key to developing communicative competence. Bottiglieri et al. (2025) note that intelligent technologies enhance mediation and scaffolding, favoring the internalization of linguistic structures and a meaningful learning experience.

Adaptive learning theory describes how educational systems can adjust to individual characteristics to maximize effectiveness. Barrutia Barreto et al. (2025) explain that adaptive environments with AI personalize pathways, activities, and assessments, optimizing the progressive acquisition of competencies.

In digital education, gamification is based on motivational theories that consider play as essential for maintaining attention and interest. Rincón (2024) proposes self-determination theory, which holds that intrinsic motivation is enhanced when individuals experience competence, autonomy, and relatedness—elements that gamification effectively integrates into English teaching.

Learning analytics, a discipline that utilizes big data to improve education, allows for personalized feedback and adjustments to teaching strategies for more effective and continuous learning (Hernández, 2021).

AI applied to education is grounded in cognitive and computational models that simulate human processes to provide adaptive teaching. López et al. (2025) note that intelligent systems identify patterns, anticipate difficulties, and recommend specific interventions, representing a significant advancement for teaching English as a second language.

The TPACK model emphasizes the coherent integration of technology, pedagogy, and content. Morales and Poveda (2022) highlight that developing teacher competencies within this model is essential to leverage the potential of AI and other technologies in personalizing learning, ensuring that technology complements and enhances pedagogical processes.

Finally, situated learning theory posits that knowledge is constructed in authentic contexts, facilitated by technological environments that simulate real situations. Riojas (2024) asserts that these experiences promote effective transfer of linguistic competence to the real world, a central objective in AI-supported English teaching.

In summary, technological evolution and its influence on education necessitate understanding how AI and ML contribute to personalizing English instruction. The diversity of learning styles and paces demands flexible approaches that optimize the development of linguistic competence. Therefore, this research focuses on analyzing how these emerging technologies enhance educational personalization and improve linguistic competence in the educational contexts of Ecuador, Mexico, and Bolivia. The central question guiding this study is: How do artificial intelligence and machine learning contribute to the personalization of English teaching to improve linguistic competence in different educational contexts?

## Methodology

This study was developed through a systematic review, with the primary objective of examining the impact of artificial intelligence and machine learning on the personalization of English language teaching, as well as their influence on improving students' linguistic competence. To this end, a rigorous analysis of the available literature was conducted, focusing on relevant studies and documents that addressed this topic, in order to identify trends, challenges, and opportunities arising from the implementation of AI technologies in various educational contexts.

The literature review was carried out using recognized academic databases, such as SciELO and Scopus, selected for their prestige and for providing access to peer-reviewed research in the fields of education and technology. This choice was based on their capacity to provide rigorous studies on the application of AI in language teaching and its impact on personalized learning.

The processing and organization of the collected information were carried out using Excel software, which facilitated the structuring, analysis, and orderly presentation of the data, ensuring the integrity of the information and optimizing the evaluation of the sources (Gallegos et al., 2017). Mendeley was employed for bibliographic management, ensuring a rigorous and systematic handling of the consulted references. Additionally, a PRISMA flow diagram was implemented to visualize the article selection process, guaranteeing transparency and replicability in the systematic review.

The study was organized under a systematic review approach, utilizing the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology, which ensures a rigorous, transparent, and reproducible process in the identification, selection, and analysis of research related to the application of AI in personalized English teaching (Chocobar et al., 2025). The methodological aspects and procedures implemented to ensure the quality and relevance of the analysis are detailed below.

To ensure the currency and relevance of the analyzed studies, the following inclusion criteria were defined:

- **Publication date**: Research published between 2015 and 2025 was considered, covering the most recent advances in AI applied to educational personalization.
- **Thematic focus**: The selected studies directly addressed the application of AI and ML in the personalization of English teaching.
- **Peer review and accessibility**: Only peer-reviewed publications available in open access or through recognized academic databases were included, ensuring academic quality.
- **Language**: Research published in English and Spanish was considered, given the predominance of these languages in the relevant scientific literature.

Exclusion criteria were also established to maintain a clear and pertinent focus:

- Studies prior to 2015, to concentrate on recent technologies.
- Research that did not address English teaching or educational personalization through AI.
- Works without empirical evidence, limited to conceptual or theoretical reviews without concrete results.
- Studies whose practical application was not linked to the personalization of English teaching processes.

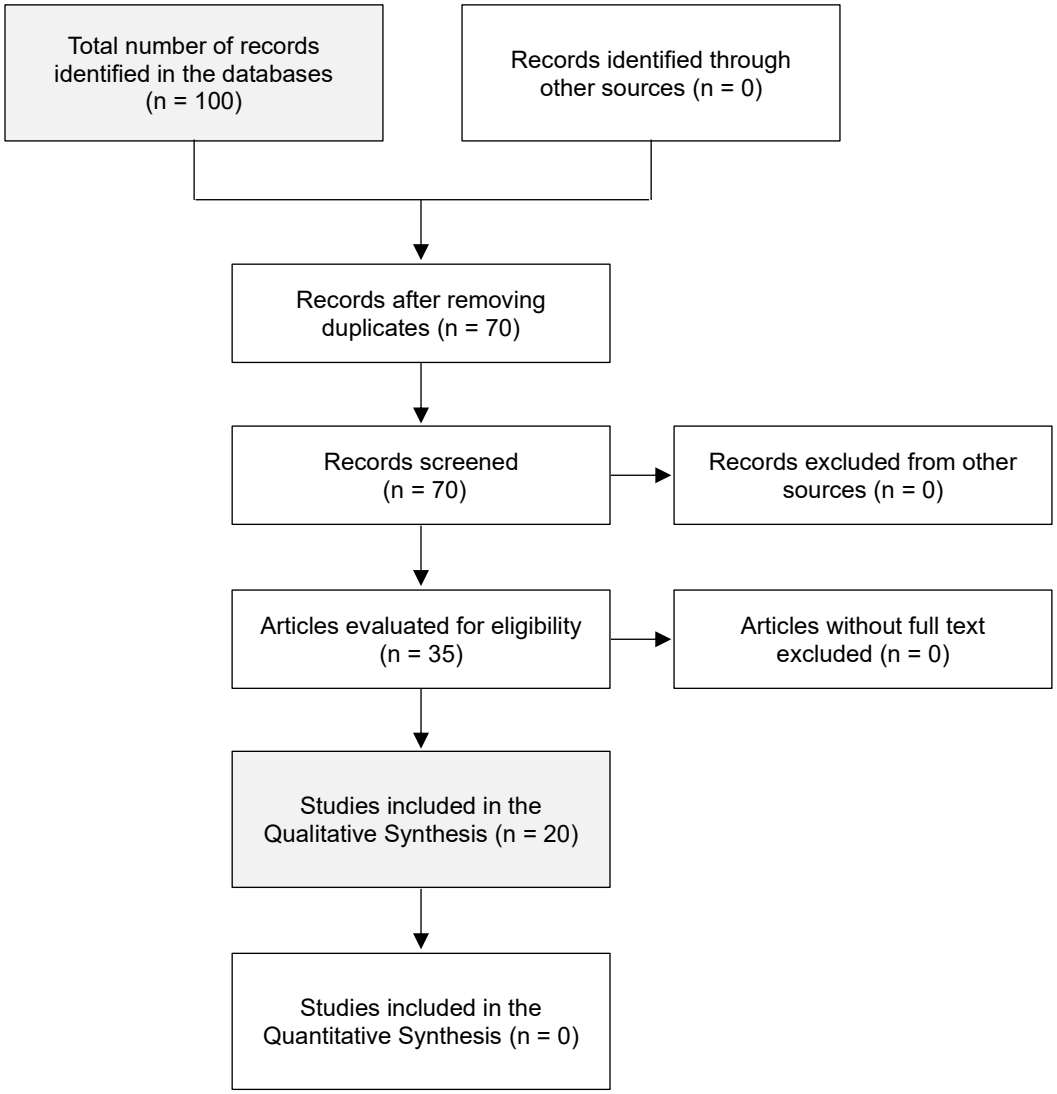
The document search was conducted in the aforementioned databases, using a strategy that included key terms such as "artificial intelligence in English teaching," "educational personalization through AI," "machine learning in language education," and "adaptive technologies in English language learning." The combinations were adjusted according to the specific requirements of each database to maximize the retrieval of relevant results.

In the identification phase, 100 studies related to the topic were initially located. To organize the records and eliminate duplicates, the Mendeley bibliographic manager was used. Subsequently, during the screening stage, the titles and abstracts of 70 studies were reviewed after the removal of duplicates. In this preliminary review, those that did not meet the inclusion criteria were discarded, leaving 35 studies for a more detailed analysis.

In the eligibility phase, the 35 documents were thoroughly evaluated, excluding those without specific empirical evidence on the personalization of English learning through AI. Finally, 20 studies were selected for the in-depth analysis that supports this systematic review.

The 20 selected studies were organized into a matrix designed to facilitate a detailed comparative analysis. It considered key categories such as the year and author of each investigation, allowing for temporal contextualization of the works and recognition of the most relevant contributions; the title of the study, which facilitated clear identification of the focus and scope; and a summary that synthesized the main findings related to the application of AI in the personalization of English teaching. Additionally, the DOI or URL of each document was included to ensure easy and accurate consultation and verification in the future.

**Figure 1**
*PRISMA method*




## Results and discussion

In this study, a thorough analysis of the scientific literature was conducted with the aim of identifying how artificial intelligence (AI) and machine learning (ML) have been applied in the teaching of English as a foreign language in educational contexts in Ecuador, Mexico, and Bolivia. This analysis not only allowed for the classification of emerging technological strategies but also detected trends, gaps, and common challenges in the studied countries, as evidenced by recent research on generative AI tools in educational settings (Chocobar et al., 2025), teacher perceptions regarding these technologies (Espejo, 2024), and experiences aimed at improving oral expression through their implementation (López et al., 2025).

Using the PRISMA methodology, a systematic review of research published in the last five years was conducted, selecting 20 studies that addressed the implementation of AI- or ML-based tools for educational purposes, specifically in the acquisition of English language skills. The selection was based on criteria of relevance, methodological rigor, and educational applicability. Additionally, contributions regarding the methodological value of systematic reviews (Silamani, 2015) and studies analyzing the pedagogical role of research incubators in emerging technological contexts (Rodríguez, 2025) were incorporated, which ensured the validity of the analyzed corpus.

The results were presented through comparative tables that synthesized the main characteristics of the reviewed studies, such as the type of technology used, learning objectives, educational level, country of application, and observed effects. This systematization allowed for visibility into the degree of development and

integration of these technologies in each educational context. For example, innovative proposals incorporating adaptive learning models based on performance prediction were identified (Ezzaim et al., 2023), as well as experimental comparisons between AI-generated assessments and those conducted by trainee teachers (Galindo et al., 2024), facilitating a deep analysis of the pedagogical and didactic implications derived from their implementation.

**Table 1**
*Benefits of using AI and ML in English teaching*

| Key benefit | Description |
|---|---|
| Personalization of learning | Adjustment of content, feedback, and pace according to the student |
| Student autonomy | Greater control over the learning process through virtual resources |
| Adaptive learning | Systems that adapt activities based on performance |
| Gamification and motivation | Use of playful dynamics to enhance engagement and attention |
| Analytical progress tracking | Use of data for feedback and personalized adjustments |
| Improvement of communicative competence | Simulated interactions that promote functional language use |

The main benefits observed in the application of artificial intelligence and machine learning in English teaching highlight their contribution to enhancing the educational experience in digital environments.

**Table 2**
*Challenges by country in implementing AI and ML in English teaching*

| Country | Technological Challenges | Pedagogical Challenges | Structural Challenges |
|---|---|---|---|
| Ecuador | Limited access in rural areas | Lack of teacher training | Significant digital divide |
| Mexico | Unconsolidated technological integration | Weak teacher training | Lack of pedagogical coordination |
| Bolivia | Inequality in digital access | Limited digital culture among teachers | Low public investment in educational innovation |

The comparative analysis of the challenges faced by Ecuador, Mexico, and Bolivia in implementing artificial intelligence and machine learning in English teaching reveals both regional similarities and specific peculiarities of each country. In the technological realm, Ecuador and Bolivia exhibit limited and unequal access to connectivity in rural areas, which hinders the effective appropriation of digital tools and exacerbates the educational divide. This issue has been highlighted by Bobro et al. (2025) when examining institutional decisions related to technological investment. Furthermore, Riojas (2024) emphasizes the disparity between public and private universities in the use of AI for learning English as a second language.

On the other hand, Mexico faces challenges related to a still incipient technological integration, where the lack of consolidation of educational platforms limits the sustainability of digital processes. Morales and Poveda (2022) analyze the weaknesses of teachers in handling virtual tools, while Jacovkis et al. (2022) identify tensions among educational institutions, families, and Big Tech platforms, adding complexity to the technological landscape.

From a pedagogical perspective, all three countries exhibit deficiencies in teacher training for the effective use of emerging technologies. In Bolivia, a weak digital culture persists among educators, while in Mexico, insufficient training directly impacts educational quality. Roy et al. (2025) document how digital self-efficacy varies by age and gender, affecting teachers' confidence, and Mera (2024) relates this weakness to resistance to adopting innovative approaches in multicultural contexts.

Finally, on the structural level, significant barriers remain, such as the marked digital divide in Ecuador, the lack of pedagogical cohesion in Mexico, and the limited state investment in educational innovation in Bolivia. De la Peña and Chaves (2024) address the impact of active methodologies in digitalized environments, while Bottiglieri et al. (2025) warn of the need for inclusive policies that accompany the rapid incorporation of AI in higher education. In light of this scenario, it is essential to design comprehensive strategies tailored to national realities

that articulate technology, pedagogy, and institutional management to strengthen English teaching through artificial intelligence in Latin America.

**Table 3**
*Projections and opportunities in using AI in English teaching*

| Dimension | Projection | Key requirements |
|---|---|---|
| Educational transformation | Expansion of hybrid and digital models | Technological infrastructure and connectivity |
| Personalization of learning | Student-centered approaches with AI and ML | Teacher training in TPACK models |
| Communicative interaction | Simulated environments for language practice in real contexts | Immersive and gamified platforms |
| Reduction of gaps | Use of analytics for differentiated attention | Inclusive and sustainable policies |

The review of the analyzed studies allows for the identification of key projections to achieve effective integration of artificial intelligence in English teaching. Firstly, in terms of educational transformation, there is a clear trend toward hybrid models and digital environments that, to be sustainable, require robust technological infrastructure and equitable access to connectivity. This need has been highlighted by Gallegos et al. (2017), who point out the usefulness of bibliographic managers as an integral part of virtual learning environments, and also by Hernández (2021), who emphasizes the importance of addressing complex grammatical aspects in technology-mediated classes.

Regarding the personalization of learning, research points to a student-centered approach, where both AI and machine learning allow for the adjustment of content, activities, and pacing according to individual characteristics. However, this line of work demands specific teacher preparation. Leonet et al. (2025) emphasize the relevance of self-perception of communicative competence in multilingual contexts, while Barrutia Barreto et al. (2025) propose the self-questioning of literary texts as a didactic strategy to foster more autonomous and personalized learning.

On the other hand, concerning communicative interaction, innovative experiences have been documented that employ simulated environments and platforms with gamification components to promote active language practice in dynamic and motivating scenarios. For example, Pérez et al. (2025) analyze the use of emojis in educational digital platforms, proposing them as effective communicative mediators, while Posada and Garzón (2025) explore the role of emotions in the construction of teacher identity during initial training for English teachers.

Finally, in the realm of equity, some studies demonstrate how the application of AI-based learning analytics allows for differentiated attention to students' needs, thereby fostering a more inclusive education. Lu (2022) examines linguistic development in multilingual contexts, highlighting how the adaptability of AI systems can benefit students with diverse linguistic backgrounds. Likewise, Rincón (2024) addresses the challenges of semantic interpretation in learning English as a second language, underscoring the importance of personalized and contextualized environments. Together, these projections reaffirm the potential of AI not only to transform learning but also to sustainably reduce educational gaps.

**Table 4**
*Educational theories associated with AI and ML in English teaching*

| Theory/Model | Contribution to English teaching with AI |
|---|---|
| Constructivism | Knowledge as active construction with technological mediation |
| Sociocultural approach | Learning as social interaction mediated by technology |
| Adaptive learning | Personalized instructional pathways with AI |
| Self-determination theory | Intrinsic motivation through play and autonomy |
| Learning analytics | Use of educational data to optimize teaching |
| Educational artificial intelligence | Cognitive simulation for content adaptation |

| | |
|---|---|
| TPACK model | Effective integration of technology, pedagogy, and content |
| Situated learning | Application of knowledge in real contexts through technology |

Educational theories and models provide essential approaches for integrating artificial intelligence into English teaching, promoting active, personalized, and motivated learning, supported by technology and authentic contexts. In this sense, the personalization of learning stands as a fundamental axis for enhancing linguistic competence, fostering both student engagement and long-term knowledge retention. However, its implementation faces significant challenges in countries like Ecuador, Mexico, and Bolivia, where structural limitations persist. For instance, Díaz (2025) warns about the absence of a clear methodological definition that facilitates the curricular integration of these technologies, while Correa (2021) points out legal and technological gaps that hinder the deployment of innovative educational tools within outdated regulatory frameworks.

Despite advances in the development of digital platforms and hybrid teaching models, their effectiveness still depends on the existence of a coherent pedagogical ecosystem and public policies that promote digital inclusion at all educational levels. In this context, Rodríguez (2025) highlights the importance of forming research incubators that understand the pedagogical use of AI, while Espejo (2024) collects teachers' perceptions, evidencing the need to strengthen their knowledge in technology-mediated educational environments. Nevertheless, inequalities in access to connectivity, especially in rural areas, continue to limit the transformative impact of these proposals.

Furthermore, the traditional teacher-centered approach is gradually being replaced by pedagogical models that integrate emerging technologies and foster student autonomy, as well as active participation in diverse virtual environments. In this framework, Chocobar et al. (2025) provide a broad view of the use of generative AI tools, such as ChatGPT, while Roy et al. (2025) demonstrate how factors like gender and age influence teachers' digital self-efficacy, affecting their willingness to adopt methodological changes. In this scenario, AI emerges as a key tool for adapting content, evaluating progress, and diversifying pedagogical strategies according to the specific needs of each student.

However, the opportunities offered by AI to transform English teaching continue to face significant structural barriers. Various studies have identified obstacles such as limited technological infrastructure and insufficient teacher training, aspects that restrict full implementation in national contexts (Riojas, 2024). Morales and Poveda (2022) caution that inadequate teacher preparation in digital environments compromises the quality of teaching in technology-mediated contexts.

Overcoming these barriers requires effective articulation between technology, pedagogy, and content, through strategies that respond to the particularities of each educational system. In this regard, Jacovkis et al. (2022) draw attention to the need for critical governance concerning digital educational platforms, while Bottiglieri et al. (2025) examine how teachers' attitudes directly influence the adoption or rejection of artificial intelligence in higher education. In this context, the application of models such as adaptive learning, gamification, and educational data analytics appears as a promising pathway to foster more personalized, motivating, and effective processes.

Finally, situated learning, understood as that which develops in technological environments simulating authentic scenarios, significantly contributes to the transfer of linguistic knowledge to everyday life. Ezzaim et al. (2023) support this idea through their proposal of an AI-based performance prediction framework, while Barrutia Barreto et al. (2025) highlight how the self-questioning of literary texts in English can enrich the learning experience in technology-mediated contexts.

## Conclusions

The incorporation of artificial intelligence and machine learning in English teaching has proven to be an effective strategy for personalizing the educational process and strengthening students' linguistic competence. These technologies facilitate the adaptation of content, learning paces, and methodologies to the individual characteristics of each student, generating more inclusive, dynamic, and effective environments. Through automatic feedback, adaptive platforms, and contextualized learning experiences, students can develop their communicative skills in English with greater autonomy and motivation.

However, the impact of these innovations largely depends on structural and pedagogical factors. In educational contexts such as those in Ecuador, Mexico, and Bolivia, significant challenges persist related to access to technology, teacher training, and curricular adequacy. The lack of adequate infrastructure and specialized training limits the full utilization of these tools, hindering equitable and sustainable implementation.

Despite these limitations, AI and ML represent a transformative opportunity to redesign English teaching in a more student-centered, flexible, and contextualized manner. For these solutions to reach their maximum

potential, it is essential to consolidate a coherent educational ecosystem that articulates technology, pedagogy, and inclusive policies. In this sense, future lines of research could focus on developing specific teacher training models for advanced technological environments, evaluating the impact of adaptive platforms in diverse sociocultural contexts, and designing public policies that promote equity in access to educational technologies. Additionally, it is relevant to explore how learning analytics can further personalize the educational experience and facilitate data-driven pedagogical decision-making. Ultimately, technological personalization not only enhances linguistic performance but also constitutes a viable path toward more innovative, adaptive, and equitable education.

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