

Artificial Intelligence Tools for the Development of Writing Skills in English Language Learners: A Literature Review

DOI: <https://doi.org/10.53358/s3csnd72>
elocation-id: e1347

Citación:

Dávila, O.; Ponce, P.; Fuentes, B.; Bustamante, A. & Marcillo, L. (2025) Artificial Intelligence Tools for the Development of Writing Skills in English Language Learners: A Literature Review. *Revista Ecos de la Academia*, 11(22): e1347, 1-28. <https://doi.org/10.53358/s3csnd72>

Enlace al registro del repositorio Universidad Técnica del Norte:
<http://repositorio.utn.edu.ec/handle/123456789/13649>

Versión del documento:

Artículo de Revisión (versión de publicación)

Este artículo fue evaluado mediante arbitraje doble ciego.

Creative Commons:

Esta revista está bajo una licencia de <https://creativecommons.org/licenses/by-nc-sa/4.0/>



© 2025 por los autores. Publicado por Editorial UTN, Ibarra, Ecuador, a través de la revista Ecos de la Academia. Este artículo es de acceso abierto y se distribuye bajo los términos de la licencia Creative Commons Attribution-NonCommercial-ShareAlike (CC BY-NC-SA) (<https://creativecommons.org/licenses/by-nc-sa/4.0/>).

Políticas de acceso y reuso

La Revista Ecos de la Academia ofrece acceso libre, inmediato y gratuito a todos sus contenidos, sin establecer períodos de embargo ni cobrar tasas por postulación, procesamiento, diagramación o publicación. Esta política se fundamenta en el principio de que el conocimiento científico es un bien público, accesible sin restricciones financieras, técnicas ni legales.

Todos los artículos se distribuyen bajo la licencia Creative Commons Atribución-NoComercial-CompartirIgual 4.0 Internacional (CC BY-NC-SA 4.0), que permite copiar, distribuir, remezclar y adaptar el contenido, siempre que se otorgue el crédito correspondiente a los autores, no se utilice con fines comerciales y las obras derivadas se compartan bajo la misma licencia. No se permiten restricciones legales ni tecnológicas adicionales que limiten lo que esta licencia permite.

Los autores conservan sus derechos de autor sin restricciones y pueden archivar cualquier versión del artículo en repositorios institucionales, temáticos, redes académicas o sitios personales. Ecos de la Academia promueve además la transparencia en el acceso al conocimiento, recomendando el depósito de preprints, datos y recursos complementarios en plataformas como OSF o LatRxiv. La revista asegura la preservación a largo plazo de sus contenidos mediante redes como PKP PN, LOCKSS y CLOCKSS, la adhesión a la Iniciativa para Citaciones Abiertas (I4OC), y garantiza la interoperabilidad de sus metadatos a través del protocolo OAI-PMH disponible en: <https://revistasojn.utn.edu.ec/index.php/ecosacademia/oai>.

Artificial Intelligence Tools for the Development of Writing Skills in English Language Learners: A Literature Review

Herramientas de inteligencia artificial para el desarrollo de habilidades de escritura en estudiantes del idioma inglés: una revisión de la literatura

Óscar Germán Dávila Eskola*

Universidad Técnica del Norte
Ibarra, Imbabura, Ecuador
ogdavilae@lauemprende.com
ORCID: <https://orcid.org/0009-0003-9990-1801>

Peter Vicente Ponce Cadena

Unidad Educativa Fiscomisional "Santa Luisa de Marillac"
Atuntaqui, Imbabura, Ecuador
petercadena2011@gmail.com
ORCID: <https://orcid.org/0009-0007-9810-2011>

**Brayan Orlando Fuertes
Camacás**

Unidad Educativa "Alfonso Herrera"
El Ángel, Carchi, Ecuador
brayan.fuertes@educacion.gob.ec
ORCID: <https://orcid.org/0009-0001-9026-256X>

**Alex Romario Bustamante
Granda**

Unidad Educativa Milenio Malimpia
Malimpia, Esmeraldas, Ecuador
romario.bustamante@educacion.gob.ec
ORCID: <https://orcid.org/0009-0004-9351-2677>

Leslie Ailin Marcillo Perugachi

UUIC English Courses
Otavalo, Imbabura, Ecuador
ailinmarcillo23@gmail.com
ORCID: <https://orcid.org/0009-0007-9261-8164>

Abstract

This literature review examines the impact of artificial intelligence (AI) tools on the development of writing skills in English language learners (ELLs). It is aimed at analyzing relevant findings from current academic studies on how AI-powered technologies—such as grammar checkers, writing assistants, and automated feedback systems—support ELLs in improving coherence, grammatical accuracy, vocabulary use, and overall textual organization. A qualitative methodology was applied to gather and select peer-reviewed articles from the last ten years, accessed through major academic databases such as Scopus, Web of Science, Google Scholar, and SciELO. The findings reveal that AI tools contribute to enhanced writing proficiency due to the easy access to real-time corrective feedback, lexical enrichment, and syntactic structuring, thus, fostering learner autonomy and engagement. Nevertheless, the review also highlights persistent challenges, including the risk of overreliance on AI, limited adaptability to learners' individual contexts, and the importance of meaningful human feedback. The study suggests that although AI tools offer transformative potential for English language writing instruction, their integration must be guided by pedagogical frameworks and adapted to instructional goals.

Revisión/Review

Financiación / Fundings
Sin financiación

Correspondencia / Correspondence
ogdavilae@lauemprende.com

Recibido / Received: 03/11/2025
Revisado / Revised: 10/11/2025
Aceptado / Accepted: 30/12/2025
Publicado / Published: 31/12/ 2025

Cita recomendada:

Dávila, O.; Ponce, P.; Fuertes, B.; Bustamante, A. & Marcillo, L. (2025) Artificial Intelligence Tools for the Development of Writing Skills in English Language Learners: A Literature Review. *Revista Ecos de la Academia*, 11(22): e1347, 1-28. <https://doi.org/10.53358/s3csnd72>

DOI: <https://doi.org/10.53358/s3csnd72>
elocation-id: e1347

ISSN

Edición impresa: 1390-969X
Edición en línea: 2550-6889

Resumen

Esta revisión de literatura examina el impacto de las herramientas de inteligencia artificial (IA) en el desarrollo de las habilidades de escritura en estudiantes de inglés como lengua extranjera (ELLs, por sus siglas en inglés). Su objetivo es analizar los hallazgos relevantes de estudios académicos actuales sobre cómo las tecnologías impulsadas por IA—como los correctores gramaticales, los asistentes de redacción y los sistemas de retroalimentación automatizada—apoyan a los estudiantes en la mejora de la coherencia, la precisión gramatical, el uso del vocabulario y la organización textual general. Se aplicó una metodología cualitativa para recoger y seleccionar artículos revisados por pares publicados en los últimos diez años, obtenidos a través de bases de datos académicas reconocidas como Scopus, Web of Science, Google Scholar y SciELO. Los hallazgos revelan que las herramientas de IA contribuyen a una mayor competencia escrita al ofrecer retroalimentación correctiva en tiempo real, enriquecimiento léxico y estructuración sintáctica, lo cual fomenta la autonomía y el compromiso del estudiante. No obstante, la revisión también resalta desafíos persistentes, como el riesgo de una dependencia excesiva de la IA, la limitada adaptabilidad a los contextos individuales de los estudiantes y la importancia de retroalimentación humana y significativa. El estudio sugiere que, aunque las herramientas de IA ofrecen un potencial transformador para la enseñanza de la escritura en el idioma inglés, su integración debe estar guiada por marcos pedagógicos y adaptarse a los objetivos instruccionales. Esto, para garantizar un uso equilibrado, ético y efectivo en contextos de aprendizaje del inglés.

Keywords: desarrollo del idioma; estudiantes del idioma inglés; habilidades de escritura; inteligencia artificial; tecnología educativa

Introduction

In recent years, the integration of artificial intelligence (AI) technologies into educational contexts has generated significant attention in researchers and educators. This observation is corroborated by Daskalaki et al. (2024), who note that: "Most educators report a solid understanding of AI and acknowledge its potential risks, emphasizing AIEd is primarily used for educator support and engaging students" (p. 2) This interest stems from the transformative potential of AI to enhance teaching and learning across various domains, particularly in language education. AI-powered tools—such as grammar checkers, automated writing assistants, and feedback-generating systems—are becoming each time more popular in both formal and informal learning environments. These tools are designed to provide real-time assistance, helping learners identify and correct errors, improve sentence

structure, and refine vocabulary usage. They provide timely grammar corrections, style suggestions, and alternative expressions, assisting learners in real-time to enhance the mechanical quality of their writing (Calma et al., 2022). Regarding English Language Learners (ELLs), the development of writing skills poses persistent challenges.

English language writing proficiency requires not only command of grammar and vocabulary, but also the ability to structure ideas logically, maintain coherence, and adhere to the conventions of academic discourse. Siekmann et al. (2022) assert that "less proficient EFL writers especially struggle with text structure and coherence, often omitting conclusions and failing to establish a broad common thread" (p. 2). Furthermore, Wang and Xie (2022) emphasize that discourse competence in academic writing embraces topic building, global coherence, local coherence, logical connectives, and reader-writer interaction—all essential beyond grammar and vocabulary. Thus, AI tools emerge as valuable educational supporters that offer immediate, personalized, and scalable help. Their ability to provide consistent feedback without overburdening human instructors presents an opportunity to rethink traditional approaches to English language writing instruction.

Despite the insertion of AI tools in language teaching and learning process, the academic scholars are still debating about their pedagogical effectiveness and limitations. Empirical studies have documented various benefits, including improvements in grammatical accuracy, increased lexical diversity, enhanced structural organization, and development of learner autonomy. Li et al. (2024) reported that generative AI-powered writing assistants increased productivity and confidence in writing, offering benefits such as direct content generation assistance and improved writing performance. Besides, critics caution that overreliance on AI tools might hinder cognitive engagement with the writing process, leading to superficial error correction rather than meaningful learning. Williams (2022) warns that the use of AI tools that automate aspects of the writing process may discourage individuals from engaging with the learning material.

Concerns have also been raised about the limited capacity of AI systems to understand context, detect nuanced meaning, or provide culturally responsive feedback. Eslit (2024) points out that AI language tools often fall short in recognizing sociocultural cues and pragmatic subtleties, which are crucial for effective communication in diverse classroom settings. Eswaran et al. (2024) highlight that research on AI in language learning is expanding rapidly, yet remains inconsistent in its methodologies, learner populations, and definitions of successful outcomes.

Studies vary widely in terms of research design, theoretical framework, target population, and the specific AI tools evaluated. This diversity, while indicative of growing interest, also makes it difficult to synthesize findings and assess the broader impact of AI on writing development in ELLs.

Therefore, the purpose of this literature review is to synthesize and critically evaluate recent empirical research—spanning the last five years—on the use of AI tools in the development of writing skills among English language learners. This review adopts a qualitative approach, utilizing thematic analysis to identify major trends, pedagogical benefits, and recurring limitations highlighted across peer-reviewed studies. The aim is to consolidate existing knowledge into a coherent narrative that not only captures the current state of research but also uncovers conceptual and methodological gaps in the literature. Hence, this review aims to inform educators, researchers, and technology developers about the opportunities and challenges of integrating AI into language learning.

Sociocultural Theory of Language Learning

Rooted in the work of Lev Vygotsky (1978), sociocultural theory suggests that cognitive development is inherently social and mediated through cultural tools. In language learning, especially in the acquisition of writing skills, tools such as AI-based grammar checkers and writing assistants serve as means that support learners within their Zone of Proximal Development (ZPD). The ZPD refers to the distance between what a learner can do independently and what they can achieve with guidance. AI tools can be conceptualized as digital scaffolds that help learners perform tasks just beyond their current ability levels, thereby promoting language development in a supported yet autonomous way.

Lantolf and Thorne (2006) argue that technological tools, when aligned with sociocultural principles, enhance learning by providing contextualized and responsive support. AI-powered writing tools—like Grammarly or QuillBot—are designed to deliver real-time feedback and linguistic suggestions that simulate expert support. This aligns with Vygotsky's emphasis on the importance of guided participation, where learners internalize new knowledge through interaction with more knowledgeable others—or in this case, through intelligent systems. These tools become part of the learner's cognitive ecosystem, actively shaping how they improve their written output.

Moreover, the dialogic relationship between learners and AI tools reflects the kind of interaction that occurs between students and teachers. Although these tools are non-human, they initiate a feedback ring that encourages revision and reflection. Recent studies by Li et al. (2023) and Wang and Vásquez (2022) indicate that ELL students who engage iteratively with AI systems develop a greater sense of agency over their writing process. This can lead to internalization of language rules and conventions, echoing sociocultural models where learning is both socially situated, and tool mediated.

However, there are critical concerns regarding the quality and appropriateness of mediation provided by AI tools. Critics such as Kramsch (2014) argue that sociocultural theory requires sensitivity to cultural and contextual nuances—something current AI systems are often unable to fully accommodate. While AI can provide feedback, it lacks the human ability to tailor responses to individual learners' emotional states, linguistic backgrounds, or socio-academic goals. Therefore, while these tools offer valuable support, they must be complemented by human mediation to provide a more pedagogical balance.

Thus, sociocultural theory provides a compelling framework to understand how AI functions not as a replacement for instruction but as a complementary mediational tool that scaffolds learner development. This theoretical view emphasizes the importance of guided interaction, contextual sensitivity, and collaborative learning—values that must inform the integration of AI technologies into writing instruction for ELLs.

Theories in English Language Learning

Theoretical constructs within language learning emphasize the pivotal role of language production and feedback in the overall process of English language learning. Merrill Swain's (1995) Output Hypothesis proposes that language learning is significantly enhanced when learners are pushed to produce output—particularly in writing—as it promotes language processing and internalization. In English language learning contexts, AI writing assistants function as tools that encourage such output by prompting learners to revise and refine their writing. These iterative processes align with Swain's theoretical model, as learners are constantly required to formulate, test, and reformulate language in response to AI-generated feedback.

Complementing Swain's perspective, Long's (1996) Interaction Hypothesis emphasizes that language development is most effectively achieved through interaction and negotiation of meaning. While AI tools do not provide human-

like dialogue, many are programmed to offer immediate and contextually relevant corrective feedback, simulating interaction in the revision process. Tools such as Write & Improve and Grammarly generate real-time suggestions that help learners identify and amend errors, thereby participating in a form of interactive learning. Research by Alotaibi et al. (2025) evidence that English Language Learners (ELLs) benefit from these simulations, particularly because the systems require learners to process feedback cognitively before accepting or rejecting it, mimicking the negotiation of meaning found in face-to-face interactions.

Furthermore, Schmidt's (1990) Noticing Hypothesis provides a critical link between consciousness and language acquisition, suggesting that learners must consciously "notice" linguistic forms to acquire them effectively. AI tools operationalize this theory by visually flagging errors and offering corrections that heighten learners' metalinguistic awareness. As learners interact with these corrections, they begin to recognize patterns and rules that govern the English language. Wei et al. (2021) demonstrate that this repeated exposure to linguistic input, paired with active revision, leads to improvements in both grammatical accuracy and lexical diversity, underscoring the role of AI in supporting language noticing mechanisms.

Despite these pedagogical advantages, the integration of AI into English language learning presents notable challenges. One primary concern lies in the superficial nature of much automated feedback. Ranalli (2018) argues that AI systems often promote surface-level corrections, such as fixing spelling or punctuation, while neglecting deeper structural or rhetorical aspects of writing. Moreover, most AI feedback lacks pedagogical intentionality—it can highlight an error but rarely explains why the error occurred or how to avoid it in the future. This absence of meaningful explanation limits the potential for lasting learning, particularly for ELLs who may need more explicit instructional support to transfer feedback into long-term knowledge. Therefore, while AI can facilitate English language learning, its effectiveness depends on being supplemented with human guidance and reflective practice.

Cognitive Load Theory

Cognitive Load Theory (Sweller, 1988) provides another crucial perspective on the use of AI in English language writing. According to this theory, working memory is limited, and instructional tools should aim to reduce extraneous load—the effort required to manage non-essential aspects of a task—so that learners can focus on essential cognitive processes. AI tools serve this function by automating mechanical tasks such as spelling correction and grammatical adjustments, thereby freeing

up cognitive resources for higher-level writing concerns such as organization, idea development, and argumentation.

This division of labor is particularly beneficial for English language learners, who may experience increased cognitive load when juggling grammar, vocabulary, and content generation simultaneously. Tools like Ginger and ProWritingAid enable learners to focus their attention on message construction and coherence, while the software manages the more procedural elements of writing. Studies by Sun and Chen (2022) and Alshahrani and Altamimi (2021) support this claim, showing that students who use AI tools demonstrate improved organization and fluency compared to those relying solely on manual revision.

Moreover, the theory supports a dual-processing view of writing: procedural tasks (e.g., punctuation, syntax) and conceptual tasks (e.g., argument construction, tone) can be addressed more efficiently when cognitive resources are not overburdened. In this regard, AI tools can scaffold writing development by enabling learners to gradually internalize lower-level conventions while concentrating on advanced writing strategies. This scaffolding aligns with layered skill acquisition, where foundational competencies are mastered before higher-order ones are fully engaged.

However, an overreliance on automation may lead to cognitive disengagement. If learners become dependent on AI to manage surface-level errors, they may neglect the metacognitive reflection necessary to internalize language rules. This phenomenon, sometimes referred to as "automation complacency" (Parasuraman & Riley, 1997), poses a risk in educational contexts where the ultimate goal is autonomous skill development. As a result, AI tools must be implemented in a way that encourages active learner participation and critical reflection.

Thus, Cognitive Load Theory provides strong justification for the use of AI in managing the complex cognitive demands of English language writing. These tools, when appropriately integrated, can streamline the writing process, reduce learner overload, and create conditions for deeper cognitive engagement with textual meaning.

Autonomy and Self-Regulated Learning

The emergence of AI tools in writing instruction also intersects meaningfully with theories of learner autonomy and self-regulated learning. Drawing from Holec's (1981) definition of autonomy as the capacity to take charge of one's own learning,

and within this context, AI tools empower learners to identify and correct linguistic errors, experiment with alternative phrasing, and monitor their own writing progress. This shift from teacher-led to automatic-led feedback can contribute to sustained language development and increased motivation. Motivation regarding the fact learners can lead their correction process at the moment of writing without the need of being in the class receiving formal instruction.

AI tools function not merely as correctors but as enablers of metacognitive activity. According to Zimmerman (2002), self-regulated learning involves goal-setting, self-monitoring, and self-reflection. AI-powered platforms like Hemingway Editor or Scribbr actively support these processes by visually presenting areas for improvement and tracking performance over time. Learners gain insight into their recurring mistakes and can develop targeted strategies to address them, which implies a personalized constant and accumulative feedback. Research by Liu and Stapleton (2020) indicates that ELLs using AI tools show greater awareness of their writing weaknesses and take more initiative in revising their texts, key indicators of growing autonomy.

Furthermore, the use of AI in writing can support strategic competence—one of the components of communicative competence—as defined by Fathi and Rahimi (2024). Strategic competence involves the ability to monitor and adapt language use in real-time, especially under communicative pressure. By providing timely, adaptive feedback, AI tools simulate this process and give learners the opportunity to practice compensatory strategies, enhancing their communicative resilience in academic writing contexts.

Nevertheless, the promotion of autonomy through AI tools depends heavily on learners' willingness and ability to engage in self-directed learning. For some students, especially those with limited technological literacy or intrinsic motivation, the presence of AI may not automatically lead to more autonomous behavior. Then, a teacher-led process might be more suitable in those situations because not all the students learn under the same conditions. As emphasized by Little (1991), autonomy must be cultivated through guided practice and supportive pedagogical environments. Without intentional instructional design, AI tools risk becoming passive correctors rather than active agents of learner empowerment.

Overall, AI tools can foster autonomy and self-regulated learning when used in along with metacognitive strategies and pedagogical support. They provide learners with the means to take control of their writing process, reflect on their development,

and engage more deeply with language learning as an active, self-driven endeavor. The importance of human pedagogical support has a fundamental role in leading students to use AI tools with academic ethics for their own benefit.

English Writing Skills Development through AI Tools

The integration of AI tools into English language learning has shown significant promise in developing writing skills among ELLs and writing is a cognitively demanding activity that requires learners to coordinate linguistic knowledge, structural organization, and rhetorical purpose. AI tools like grammar checkers, paraphrasing assistants, and content analyzers aid in this coordination by offering real-time guidance on how to produce clearer, more accurate, and better-organized texts. For ELLs, this support can be transformative, helping bridge the gap between developing language competence and academic writing expectations.

Empirical studies have shown that learners who engage regularly with AI-powered writing tools demonstrate marked improvements in coherence, vocabulary use, and syntactic variety. For instance, research by Huang and Renandya (2022) found that ELLs who used AI tools over a semester produced essays with better logical flow and more precise word choice compared to peers who revised manually. These improvements are not merely technical but reflect deeper cognitive engagement with the writing process, as learners become more aware of how to communicate effectively in English. At receiving continuous, data-driven feedback, learners gradually internalize academic writing conventions and are better prepared for the rigors of higher education and professional communication.

Moreover, the instant nature of AI feedback contributes to increased learner motivation and engagement. Unlike traditional classroom settings where feedback is delayed due to time constraints, AI offers learners the opportunity to revise immediately, reinforcing a sense of control and ownership over their learning. This allows learners to engage in multiple cycles of drafting and revision, a process that is central to writing development but often limited by numerous students in the classroom and limited time within formal instruction. As learners see their writing improve in real-time, their confidence grows gradually, encouraging sustained practice and self-directed learning.

However, the development of writing skills through AI must be critically examined in light of its limitations. While these tools help identifying surface-level issues, language learners are less skilled at evaluating content relevance, argument quality,

or cultural appropriateness. Additionally, learners may become overly dependent on automated suggestions, undermining their ability to write independently and think critically about language use. As such, AI tools should be seen as part of a balanced pedagogical approach that includes teacher feedback, peer review, and explicit instruction on genre and discourse strategies. This integrative approach ensures that learners not only produce correct writing but also develop the cognitive and rhetorical skills essential for academic success.

Hence, AI tools hold considerable potential to support the development of English writing skills in ELLs by providing targeted, real-time feedback and promoting iterative writing practices. However, their use must be guided by pedagogical principles and embedded in a broader instructional framework to ensure that the gains in writing fluency and accuracy are both meaningful and sustainable in every learner context.

Metodology

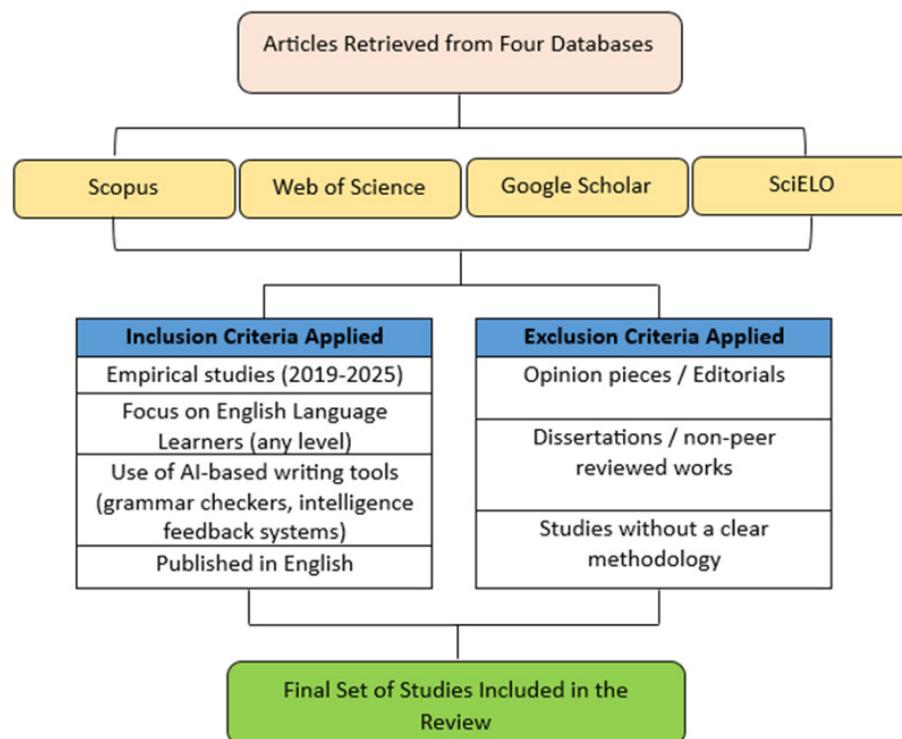
This study adopted a qualitative research design through a systematic literature review approach aimed at analyzing and synthesizing scholarly evidence on the use of artificial intelligence (AI) tools to develop writing skills in English language learners (ELLs). It was aimed to provide an in-depth, thematic understanding of how AI-powered technologies contribute to writing proficiency among English language learners. A qualitative orientation is particularly suitable for exploring the pedagogical dimensions, learner experiences, and contextual factors that shape the use of AI tools in language education.

The data for this review were collected from four major academic databases: Scopus, Web of Science, Google Scholar, and SciELO. These databases were selected based on their wide coverage of peer-reviewed publications in the fields of applied linguistics, educational technology, and language pedagogy. The inclusion criteria were as follows: (1) empirical studies published between 2019 and 2025; (2) articles focused specifically on English language learners at any educational level; (3) studies that investigated AI-based tools designed to support writing skills, including grammar checkers, automated writing assistants, and intelligent feedback systems; and (4) publications available in English. Opinion pieces, editorials, dissertations, and articles without a clearly defined methodology were excluded to ensure academic rigor and consistency.

Table 1*Data Sources Used for the Review*

DATABASE	RATIONALE FOR SELECTION	FIELD COVERAGE
SCOPUS	Provides comprehensive coverage of peer-reviewed research in linguistics and education.	Applied Linguistic Language Pedagogy
WEB OF SCIENCE	Offers high-quality, indexed journals ensuring academic rigor.	Linguistics, Educational Technology
GOOGLE SCHOLAR	Broad access to diverse research outputs, including grey literature.	Multidisciplinary (focus on EFL and AI-based studies)
SCIELO	Includes Latin American and Iberian publications relevant to regional educational contexts.	Language Teaching, Educational Research

A thematic analysis was conducted following Braun and Clarke's (2006) six-phase approach to analyze the selected studies. Initially, all studies were carefully read and grouped to identify key findings and methodological details. Codes were then generated inductively, capturing recurring ideas related to types of AI tools used, targeted aspects of writing development (e.g., grammar, coherence, vocabulary), learner outcomes, and pedagogical implications. These codes were grouped into broader thematic categories such as instructional benefits, learner engagement, limitations of AI tools, and integration strategies. The themes were refined through multiple rounds of comparison and validation to ensure internal coherence and relevance to the research objectives.

Figure 1*Inclusion and Exclusion Criteria for Article Selection*

Note: Adapted from Braun and Clarke (2006)

To enhance the reliability and transparency of the review, several strategies were implemented. Triangulation was employed using multiple databases to reduce the risk of publication bias. The application of consistent inclusion and exclusion criteria ensured that only studies of comparable scope and quality were analyzed. Furthermore, thematic saturation was achieved by analyzing enough studies until no new significant themes emerged, reinforcing the validity of the identified patterns.

Despite its strengths, the methodology has certain limitations. The reliance on published, peer-reviewed literature may exclude valuable insights from grey literature and non-English publications. Additionally, given the evolving nature of AI technologies, some studies may have focused on tools that are now outdated or no longer widely used. The diversity of AI applications and varying definitions across studies also posed challenges for comparative analysis. Nonetheless, the methodology employed provides a robust foundation for drawing evidence-based conclusions about the role of AI in enhancing the writing skills of English language learners.

Results and Discussion

The thematic analysis of peer-reviewed literature published between 2019 and 2025 revealed four overarching themes regarding the impact of AI tools on writing development in English Language Learners (ELLs): (1) enhancement of grammatical accuracy and textual coherence; (2) lexical development and syntactic complexity; (3) learner autonomy and motivation; and (4) pedagogical limitations and ethical concerns. Each theme reflects consistent patterns in how AI-supported writing environments influence English language writing instruction, learning experiences, and pedagogical practices.

Table 1
Literature Review Main Findings

Theme	Key Findings	Representative Tools/Studies	Concerns / Limitations
Grammatical Accuracy & Textual Coherence	- Real-time feedback enhances grammar and sentence structure- Improves paragraph cohesion and logical flow- Encourages self-correction and revision cycles	Grammarly, Write & Improve, Google Smart ComposeLi & Hafner (2022), Tetreault et al. (2023), Fang (2020)	Risk of superficial correction without understanding Overreliance on automated suggestions
Lexical Development & Syntactic Complexity	- Supports vocabulary expansion and contextual synonym use- Promotes advanced sentence structures- Encourages experimentation with syntax	QuillBot, ProWritingAidNguyen & Sun (2021), Alotaibi (2023)	Misuse of advanced structures Incorrect lexical substitutions Need for guided implementation
Learner Autonomy & Metacognitive Development	- Increases motivation and self-confidence- Promotes self-regulation and reflection- Encourages iterative practice and personal goal setting	Hemingway Editor, ScribbrWang et al. (2019), Liu & Stapleton (2020)	Requires digital literacy and motivation Limited effectiveness without teacher scaffolding

Pedagogical & Ethical Concerns	<ul style="list-style-type: none"> - Overuse may hinder critical thinking and internalization- AI lacks cultural/ contextual sensitivity- Raises equity and data privacy issues 	<ul style="list-style-type: none"> Xu & Brown (2020), Lee (2024), Torres & Mitchell (2022) 	<ul style="list-style-type: none"> Bias in AI feedback Access gaps for disadvantaged students Lack of transparency in AI systems
--------------------------------	--	---	---

Enhancement of Grammatical Accuracy and Textual Coherence

The selected studies evidence that there is improvement in learners' grammatical accuracy and coherence when AI tools are integrated into the writing process. Tools such as Grammarly, Write & Improve, and Google's Smart Compose provide real-time corrective feedback on spelling, punctuation, verb tense consistency, article usage, and syntactic arrangement. According to Li and Hafner (2022), intermediate-level ELLs demonstrated a measurable reduction in grammatical errors after four weeks of using an AI grammar checker integrated into their coursework, where learners using AI platforms showed increased coherence and logical flow in paragraph construction, often attributed to the restructuring suggestions made by the AI algorithms.

Importantly, the immediacy of feedback enabled more frequent self-correction and reflective revision cycles, supporting the development of metalinguistic awareness—a key component of English language writing competence. Learners began recognizing recurring error patterns and applying corrective strategies beyond the specific AI suggestions. This iterative learning process contributes to deeper internalization of linguistic rules, thus enhancing long-term writing performance.

Lexical Development and Syntactic Complexity

Lexical sophistication and syntactic variation are signals of advanced writing proficiency. The reviewed studies consistently emphasized the role of AI tools in supporting these dimensions. Sol and Heng (2024) reported that students using AI-powered writing assistants exhibited a greater range of vocabulary use, with a marked increase in academic and domain-specific terms. This development was linked to features in AI tools that offer lexical alternatives or synonym suggestions in context, exposing learners to more varied and appropriate word choices.

Moreover, syntactic complexity was positively influenced through suggestions for sentence combining, passive constructions, and clause embedding. Research by Ramadani

and Manurung (2024) found that after consistent use of an AI feedback platform over an eight-week period, advanced learners displayed an increase in the use of complex sentence structures, such as conditional forms, participial phrases, and relative clauses. These findings suggest that AI tools not only assist with surface-level correction but also function as scaffolds that encourage syntactic experimentation and linguistic risk-taking.

However, some studies raised concerns about inappropriate lexical substitutions and syntactic alterations made by learners without fully understanding their contextual appropriateness, highlighting the need for guided use of AI tools to prevent fossilization of errors or misapplication of vocabulary.

Learner Autonomy, Engagement, and Metacognitive Development

AI tools have increased the sense of learner autonomy and motivation associated with the use of AI technologies. Unlike traditional teacher-led feedback, AI tools are accessible 24/7, allowing learners to engage with writing tasks on their own terms. This accessibility fosters independent learning habits and promotes self-regulation, particularly for learners in asynchronous or remote learning contexts.

Junio and Bandana (2023) evidenced that learners reported greater confidence and willingness to write when using AI tools, as the private, non-judgmental nature of machine feedback reduced anxiety and fear of criticism. This, in turn, led to higher engagement levels and a willingness to write more frequently. Several studies emphasized that AI tools serve as a form of continuous formative assessment, enabling learners to track their progress over time, set goals, and reflect on their development.

Furthermore, interaction with AI tools encouraged the development of metacognitive strategies, such as self-monitoring and planning. When combined with reflective writing practices but overall, with teacher guidance, learners demonstrated an improved ability to articulate their writing weaknesses and intentionally revise their texts. Being the human action required to complement this learning process successfully.

Pedagogical Limitations and Ethical Considerations

Despite some of the benefits AI tools have, they have limitations as well. A significant concern lies on the risk of overreliance on AI-generated feedback. Learners may begin to trust the tool's suggestions uncritically, bypassing the cognitive effort required to understand and apply corrections meaningfully. Douglas (2024) argues that such dependency may lead to superficial revision habits, where learners implement changes without analyzing nor internalizing the linguistic principles behind them, hence, acting as another machine unable to develop critical thinking.

Moreover, AI systems often lack the contextual sensitivity and cultural awareness needed to provide meaningful feedback on rhetorical structure, idiomatic expressions, and genre conventions. Thus, while an AI tool may flag an unusual phrase, it may not understand its appropriateness within a specific cultural or educational context. This limitation was noted in studies examining writing in genres such as argumentative essays, reflective narratives, or academic reports, where nuanced feedback is crucial.

Ethical concerns also emerged, mainly regarding data privacy, algorithmic transparency, and equitable access to AI-enhanced learning environments. Several studies, including those by Douglas (2024), emphasized that students in under-resourced settings may lack access to premium AI tools, perpetuating educational inequities. Additionally, questions remain about how learner data is stored, analyzed, and potentially used by third-party providers, which arises the need for a critical review of data governance policies in educational AI.

Conclusions

This literature review has synthesized findings from recent academic research to evaluate the role of artificial intelligence tools in the development of writing skills among English language learners. The evidence demonstrates that AI-supported writing technologies have transformative potential in language education. This offers real-time, individualized, and scalable feedback, AI tools support the development of core writing competencies, including grammar, vocabulary, textual coherence, and structural organization. Learners benefit from increased autonomy, greater writing confidence, and enhanced motivation, particularly when AI is used as a complement to traditional instruction.

The review also identified several challenges and areas of concern. Among these is the potential for overdependence on AI, which may undermine learners' critical thinking and reduce their capacity to internalize language rules independently. Furthermore, current AI systems lack the depth of human understanding required to provide nuanced, context-sensitive, and culturally appropriate feedback. Without pedagogical mediation, learners may misapply suggestions or fossilize errors, thus, granting relevance to the importance of a human pedagogical guidance during the learning process. . Ethical and equity issues also warrant serious consideration, especially concerning access, data privacy, and the commercialization of educational technologies.

AI tools offer valuable support for writing instruction in ELL contexts, and they should be implemented strategically and ethically, with careful alignment to curricular goals and learner needs. Teachers must be equipped to guide learners in the critical use of these tools, integrating them into pedagogical models that emphasize reflective, informed, and context-aware language learning. Future research should move toward longitudinal and

mixed-methods studies that assess the long-term effects of AI on writing development, explore culturally responsive AI design, and investigate best practices for teacher-AI collaboration in multilingual classrooms. There must be a balanced integration of technology and pedagogy—where human insight and machine efficiency work together to support meaningful and equitable learning outcomes.

Referencias bibliográficas

Alotaibi, H.M., Sonbul, S.S. & El-Dakhs, D.A. (2025). Factors influencing the acceptance and use of ChatGPT among English as a foreign language learners in Saudi Arabia. *Humanit Soc Sci Commun* 12(8) <https://doi.org/10.1057/s41599-025-04945-2>

Alshahrani, S., & Altamimi, A. (2021). The effects of AI grammar checkers on EFL writing. *Journal of Educational Technology & Society*, 24(3), 132–144.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>

Calma, A., et al. (2022). Digital writing assistants in education: Enhancing mechanics and style through grammar fixes and alternative expressions. *International Journal for Educational Integrity*, 10(1). <https://doi.org/10.1007/s40979-024-00153-8>

Daskalaki, E., Psaroudaki, K., & Fragopoulou, P. (2024). Navigating the future of education: Educators' insights on AI integration and challenges in Greece, Hungary, Latvia, Ireland and Armenia. *International Journal of Artificial Intelligence in Education*. <https://doi.org/10.1007/s40593-024-00442-w>

Douglas KazUMO i MÂ Im. Abylaj Hana. Seriâ "Filologičeskie Nauki," 75(4). <https://doi.org/10.48371/phils.2024.4.75.026>, K. H. (2024). *On the effective and ethical use of ai in academic writing*. Izvestiâ

Eslit, E. R. (2024). AI-Enhanced Language Learning: Bridging Cultures and Breaking Barriers. <https://doi.org/10.20944/preprints202411.1866.v1>

Eswaran, U., Eswaran, V., Murali, K., & Eswaran, V. (2024). *AI-Powered Language Teaching and Learning*. Advances in Educational Technologies and Instructional Design Book Series, 55–92. <https://doi.org/10.4018/979-8-3693-4310-4.ch002>

Fathi, J., & Rahimi, M. (2024). Utilising artificial intelligence-enhanced writing mediation to develop academic writing skills in EFL learners: a qualitative study. *Computer Assisted Language Learning*, 1–40. <https://doi.org/10.1080/09588221.2024.2374772>

Holec, H. (1981). *Autonomy in foreign language learning*. Pergamon.

Huang, J., & Renandya, W. (2022). The impact of AI feedback on ELL writing development. *TESOL Quarterly*, 56(1), 65–83. <https://doi.org/10.1002/tesq.318>

Junio, D., & Bandala, A. (2023). Utilization of Artificial Intelligence in Academic Writing Class: L2 Learners Perspective. <https://doi.org/10.1109/hnicem60674.2023.10589003>

Kramsch, C. (2014). Teaching foreign languages in an era of globalization: Introduction. *The Modern Language Journal*, 98(1), 296–311. <https://doi.org/10.1111/j.1540-4781.2014.12056.x>

Lantolf, J. P., & Thorne, S. L. (2006). *Sociocultural theory and the genesis of second language development*. Oxford University Press.

Li, Z., Liang, C., Peng, J., & Yin, M. (2024, May). The value, benefits, and concerns of generative ai-powered assistance in writing. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems* (pp. 1-25). <https://doi.org/10.1145/3613904.3642625>

Li, Y., & Hafner, C. A. (2022). Mobile-assisted vocabulary learning: Investigating receptive and productive vocabulary knowledge of Chinese EFL learners. *ReCALL*, 34(1), 66–80. doi:10.1017/S0958344021000161

Little, D. (1991). Learner autonomy 1: Definitions, issues, and problems. *Authentik*.

Liu, J., & Stapleton, P. (2020). Using AI-based feedback to support writing: Implications for autonomous learning. *Journal of Second Language Writing*, 49, Article 100788.

Long, M. H. (1996). The role of the linguistic environment in second language acquisition. In W. C. Ritchie & T. K. Bhatia (Eds.), *Handbook of second language acquisition* (pp. 413–468). Academic Press.

Parasuraman, R., & Riley, V. (1997). Humans and automation: Use, misuse, disuse, abuse. *Human Factors*, 39(2), 230–253. <https://doi.org/10.1518/001872097778543886>

Ramadani, D. P., & Manurung, I. D. (2024). Enhancing High School Students' Sentence Structure Skills by Integrating Artificial Intelligence (AI) Application in English Learning Process: English. *Journal of English Development*, 4(02), 436-448.

Ranalli, J. (2018). Automated written corrective feedback: how well can students make use of it? *Computer Assisted Language Learning*, 31(7), 653–674. <https://doi.org/10.1080/09588221.2018.1428994>

Schmidt, R. (1990). The role of consciousness in second language learning. *Applied Linguistics*, 11(2), 129–158. <https://doi.org/10.1093/applin/11.2.129>

Siekmann, L., Parr, J. M., & Busse, V. (2022). *Structure and coherence as challenges in composition: A study of assessing less proficient EFL writers' text quality*. *Assessing Writing*, 54, Article 100672. <https://doi.org/10.1016/j.asw.2022.100672>

Sol, K., & Heng, K. (2024). *AI-powered chatbots as personalized academic writing assistants for non-native English speakers*. Encyclopedia of educational innovation, 1-5.

Sun, Y., & Chen, X. (2022). AI-assisted writing: Cognitive load and fluency. *Language Learning & Technology*, 26(2), 28–47.

Swain, M. (1995). *Three functions of output in second language learning*. In G. Cook & B. Seidlhofer (Eds.), *Principles and practices in applied linguistics*. Oxford University Press.

Sweller, J. (1988). Cognitive load during problem-solving: Effects on learning. *Cognitive Science*, 12(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes* (M. Cole et al., Eds. & Trans.). Harvard University Press. (Original work published 1934)

Wang, C., & Vásquez, C. (2022). Beyond the human–AI binaries: Advanced writers' self-directed use of generative AI in academic writing. *arXiv*. <https://doi.org/10.48550/arXiv.2505.12165>

Wang, Y., & Xie, F. (2022). Diagnosing EFL undergraduates' discourse competence in academic writing. *Assessing Writing*, 53, Article 100641. <https://doi.org/10.1016/j.asw.2022.100641>

W. Wei, M. Lun, L. Yong-An and Q. Qianqian, "An Analysis of AI Technology Assisted English Teaching Based on the Noticing Hypothesis," 2021 2nd International Conference on Artificial Intelligence and Education (ICAIE), Dali, China, 2021, pp. 158-162, doi: 10.1109/ICAIE53562.2021.00040

Williams, S. (2022). The benefits and drawbacks of using AI in academic writing. *Smart Online Writing*. <https://www.smartonlinewriting.com/the-benefits-and-drawbacks-of-using-ai-in-academic-writing/>

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, 41(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2

Sobre los autores

Percepción estudiantil sobre la inteligencia artificial generativa en instituciones educativas de Imbabura: un análisis exploratorio

Conflicto de intereses

Los autores declaran no tener conflicto de intereses.

Declaración de contribución

Conceptualización, O.G.D.E., P.V.P.C., B.O.F.C., A.R.B.G. y L.A.M.P.; metodología, O.G.D.E., P.V.P.C., B.O.F.C., A.R.B.G. y L.A.M.P.; validación, O.G.D.E., P.V.P.C., B.O.F.C., A.R.B.G. y L.A.M.P.; análisis formal, O.G.D.E., P.V.P.C., B.O.F.C., A.R.B.G. y L.A.M.P.; investigación, O.G.D.E., P.V.P.C., B.O.F.C., A.R.B.G. y L.A.M.P.; recursos, O.G.D.E., P.V.P.C., B.O.F.C., A.R.B.G. y L.A.M.P.; conservación de datos, O.G.D.E., P.V.P.C., B.O.F.C., A.R.B.G. y L.A.M.P.; redacción-redacción del borrador original, O.G.D.E., P.V.P.C., B.O.F.C., A.R.B.G. y L.A.M.P.; redacción-revisión y edición, O.G.D.E., P.V.P.C., B.O.F.C., A.R.B.G. y L.A.M.P.; visualización, O.G.D.E., P.V.P.C., B.O.F.C., A.R.B.G. y L.A.M.P.; supervisión, O.G.D.E., P.V.P.C., B.O.F.C., A.R.B.G. y L.A.M.P.; administración del proyecto, O.G.D.E.; obtención de financiación, N/A. Todos los autores han leído y aceptado la versión publicada del manuscrito.

Reseña de los autores

Óscar Germán Dávila Eskola: Posee una maestría en Pedagogía del Inglés como Lengua Extranjera y una licenciatura en Enseñanza del Inglés por la Universidad Técnica del Norte. Es docente de inglés en el Centro de Idiomas de La UEMPRENDE E.P.-UTN y cuenta con experiencia en diversas instituciones educativas. Tiene certificaciones internacionales Cambridge B2 y TKT (Módulos 1 y 2). Su práctica se basa en el enfoque comunicativo, la integración crítica de la tecnología educativa y el uso de plataformas digitales y herramientas de IA generativa.

Peter Vicente Ponce Cadena: Docente de Inglés como Lengua Extranjera en Ecuador. Es licenciado en Pedagogía de los Idiomas Nacionales y Extranjeros mención Inglés por la Universidad Técnica del Norte. Cuenta con certificación Cambridge C2 y con el certificado CELTA de Cambridge. Se desempeña como docente en instituciones educativas del país, entre ellas la Unidad Educativa Dos de Marzo y academias de idiomas, donde trabaja con distintos niveles educativos. Sus áreas de interés incluyen la didáctica del inglés, la fonología, la gamificación, el desarrollo de habilidades lingüísticas y el uso de tecnologías educativas.

Brayan Orlando Fuertes Camacás: Educador dedicado que obtuvo su licenciatura en Enseñanza del Idioma Inglés en la Universidad Técnica del Norte. Inició su carrera profesional en la Unidad Educativa Alfonso Herrera, en Carchi, donde se desempeñó como docente de inglés y jefe del Departamento de Inglés. Además, posee una maestría en Enseñanza del Idioma Inglés. Cuenta con la certificación Cambridge C1 Advanced. Actualmente trabaja en la Unidad Educativa Eugenio Espejo.

Alex Romario Bustamante Granda: Licenciado en Ciencias de la Educación, mención Idioma Inglés, por la Universidad Nacional de Loja. Durante 9 años se desempeña como docente de inglés en el sector público, una experiencia que le permite comprender de cerca los desafíos y dinámicas del aprendizaje de lenguas extranjeras en el contexto nacional. Es un profesional bilingüe (español e inglés) e investigador educativo.

Leslie Ailin Marcillo Perugachi: Docente de inglés en modalidades presencial y virtual. Líder académica, quien ha participado en programas internacionales de capacitación y liderazgo, como el Aspire Leaders Program. Ha participado en la organización e implementación de proyectos académicos y culturales con un fuerte compromiso con el desarrollo profesional continuo, la educación intercultural y la mejora de la práctica docente.



Esta obra está bajo una licencia de Creative Commons