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AI Writing Assistants in English Language Learning: Evaluating Feedback Quality and Learner Autonomy

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Abstract: As artificial intelligence (AI) writing assistants become increasingly integrated into English language learning (ELL), their influence on feedback quality and learner autonomy warrants critical evaluation. This mixed-methods study investigates how AI-generated feedback compares to teacher feedback in terms of accuracy, clarity, usefulness, and its impact on learner autonomy. Forty university-level ELLs completed writing tasks using either AI tools or instructor input. Results showed that while AI feedback was effective for correcting surface-level errors, it lacked the pedagogical depth necessary to foster meaningful learning. Teacher feedback, by contrast, encouraged reflective revision, metacognitive engagement, and greater writing independence. Despite AI tools' convenience and immediacy, learners often accepted suggestions passively, which hindered the development of critical evaluation skills and self-regulated learning. The study concludes that AI writing assistants can serve as useful supplements in writing instruction but should not replace human feedback. Instead, a hybrid model that combines technological efficiency with pedagogical insight may offer the most effective support for developing autonomous, reflective writers.

Keywords: AI writing assistants; autonomy; English language learning; feedback; metacognition

INTRODUCTION

The integration of artificial intelligence (AI) into language education marks a significant development in the evolving landscape of English language teaching and learning. As digital technologies become more accessible and sophisticated, AI-powered writing assistants, such as Grammarly, QuillBot, and ChatGPT, have emerged as popular tools among English language learners (ELLs) (Almashy et al., 2024; Kohnke, 2024). These tools are designed to provide real-time feedback on a range of writing features, including grammar, lexical choices, sentence structure, and stylistic coherence (Rad et al., 2023; Rahmi et al., 2024). Their growing popularity among students and educators alike signals

a shift in how writing support is accessed and delivered in English as a Second or Foreign Language (ESL/EFL) contexts. However, despite their widespread adoption, limited empirical research has examined how these tools compare to teacher feedback in terms of quality or how they influence learners' autonomy and self-regulated engagement with writing tasks. Beyond their linguistic assistance, these tools also influence how learners engage with and regulate their own writing processes, raising questions about their role in shaping learner agency and autonomy.

Feedback has long been recognized as a critical component of second language writing instruction. It not only informs learners of their linguistic inaccuracies but also scaffolds their development toward greater fluency and accuracy (X. Zhang & Zhang, 2023). Traditionally, this feedback has been provided by teachers through written comments, conferencing, and peer review sessions. However, constraints such as large class sizes, limited instructional time, and teacher workload often hinder the consistency and timeliness of such feedback. In contrast, AI writing assistants offer instantaneous and repeatable feedback (Evmenova et al., 2024; Wan & Chen, 2024), potentially enhancing the learning process by increasing the frequency and immediacy of revision cycles. At the same time, this shift from teacher-mediated to technology-mediated feedback inevitably transforms how learners make decisions, reflect, and take ownership of their language learning, core elements of autonomy in language education.

Despite their pedagogical potential, the effectiveness of AI writing assistants remains contested. There is growing concern about the quality of feedback these tools provide, particularly in terms of accuracy, contextual appropriateness, and their alignment with instructional goals (Alghannam, 2024; Williyan et al., 2024). More importantly, the increasing reliance on automated feedback may alter learners' engagement patterns, as the immediacy and convenience of AI-generated suggestions could encourage surface-level revisions rather than deeper reflection. While AI tools may facilitate error correction, their impact on learner autonomy, a central principle in contemporary language pedagogy, requires critical examination. Autonomy in language learning entails the ability of learners to take responsibility for their own development, engage in self-assessment, and make informed decisions about their language use (Betancor-Falcon, 2023; Stringer, 2024). Overreliance on AI-generated suggestions may inhibit the development of such skills, potentially fostering dependency rather than independence.

This study addresses these pedagogical concerns by evaluating the role of AI writing assistants in English language learning, focusing specifically on two key aspects: (1) the quality of feedback provided by AI tools in comparison to teacher feedback, and (2) the influence of these tools on learner autonomy in writing contexts. The study is guided by the following research questions:

1. How does the feedback provided by AI writing assistants compare to that of human instructors in terms of quality, specificity, and perceived usefulness for English language learners?

2. To what extent do AI writing assistants influence learner autonomy and self-regulated learning behaviors in English language writing tasks?

By addressing these questions, the research aims to contribute to the growing body of scholarship on technology-mediated language learning. It seeks to inform educators, curriculum designers, and policymakers about the pedagogical affordances and limitations of AI tools in fostering effective and autonomous writing practices among English language learners.

LITERATURE REVIEW

This study is grounded in two complementary theoretical perspectives: Vygotsky's Sociocultural Theory (Bennett, 2023) and Self-Regulated Learning (SRL) Theory (Zimmerman, 2018). Together, these frameworks offer a nuanced lens through which to examine the role of AI writing assistants in English language learning, particularly in relation to feedback quality and learner autonomy. Sociocultural Theory, as developed by Lev Vygotsky, posits that learning is inherently a socially mediated process. Central to this theory is the concept of the Zone of Proximal Development (ZPD), the space between what a learner can do independently and what they can achieve with appropriate support or scaffolding (Lantolf & Xi, 2023; Poehner & Lu, 2024). In this view, learning is not an isolated cognitive activity, but one deeply shaped by interaction with tools, peers, and more knowledgeable others. Within this framework, AI writing assistants can be conceptualized not merely as correction tools, but as mediational artifacts, digital partners that provide linguistic scaffolding (Anderson, 2023; de Roock, 2024). When used thoughtfully, these tools have the potential to extend the learner's ZPD by offering immediate feedback, modeling accurate language use, and enabling iterative revision. However, their effectiveness depends largely on how learners engage with them and whether the interaction fosters internalization of language knowledge, rather than passive dependence on external correction.

Complementing this, Self-Regulated Learning (SRL) Theory emphasizes the active and strategic role of the learner in managing their own learning processes. According to Zimmerman (2018), self-regulated learners plan their tasks, monitor their performance, and reflect on outcomes in order to improve. SRL theory underscores the importance of autonomy, motivation, and metacognition—skills that are especially critical in writing, where revision, self-assessment, and goal setting are integral to development. In the context of AI-assisted writing, this theory provides a useful framework for examining how learners use technological feedback to regulate their writing behavior (Fitriati & Williyan, 2025). Do they critically evaluate the feedback they receive? Do they revise thoughtfully based on that input? Or do they accept suggestions uncritically, bypassing deeper cognitive engagement? By integrating these two theoretical perspectives, the study aims to offer a holistic understanding of how AI writing assistants influence the writing process. Sociocultural theory helps conceptualize the AI tool as an external support for development (Guile, 2023), while SRL theory provides a lens for evaluating learners' internal strategies and autonomy (Teich et al., 2024). Together, they allow for an exploration of both the pedagogical value of AI-generated feedback and its cognitive and behavioral impact on learner agency in English writing tasks.

AI Writing Assistants and Feedback Quality

Feedback quality has been extensively studied in the context of second language acquisition (SLA), with a particular focus on its role in written corrective feedback (WCF). Wondim et al. (2024) distinguishes between direct and indirect feedback, noting that effective feedback must be timely, specific, and informative. However, teacher-generated feedback, while pedagogically rich, is often constrained by logistical factors such as time and workload (Creagh et al., 2025). AI writing assistants promise to mitigate these limitations by offering immediate, automated feedback, but concerns remain about its reliability and instructional value. Studies such as Crompton et al. (2024), Lee et al. (2024), Pack and Maloney (2024) have found that while AI tools can help learners identify surface-level errors (e.g., grammar, spelling), they often fall short in addressing higher-order concerns such as cohesion, argument structure, and register. Moreover, the issue of feedback interpretability is critical. Learners may misinterpret AI suggestions or accept them uncritically, thereby missing opportunities for deeper learning (Cui & Alias, 2024; Lodge et al., 2024). Therefore, it is essential to examine not just the accuracy of feedback but also how learners perceive and engage with it in practice.

Learner Autonomy in Technology-Enhanced Language Learning

The concept of learner autonomy refers to the learner's capacity to take control of their own learning process. Autonomy is particularly important in writing, where self-regulation, goal setting, and revision are key components of development. Benson (2011) emphasizes that autonomy is not a fixed trait but a dynamic and context-sensitive capacity that can be fostered through appropriate pedagogical and technological support (Kinsella et al., 2024)(Stringer, 2024a). In technology-enhanced environments, tools can either support or inhibit learner autonomy, depending on how they are used. For instance, Stockwell (2013) argues that while digital tools can promote independent learning, they may also lead to passive consumption if learners rely too heavily on them (Reichert-Schlax et al., 2023). In the context of AI writing assistants, this tension becomes pronounced: do these tools encourage learners to reflect on their writing choices, or do they create a dependence on automated suggestions? Recent research by Cummings et al. (2024)and Fitriati and Williyan (2025) explores how learners use AI tools in self-directed writing tasks. Findings suggest that while students appreciate the convenience and clarity of AI feedback, their engagement with the feedback is often superficial. This raises important questions about the long-term impact of such tools on metacognitive awareness and writing development.

Research Gap

While existing studies have explored the general effectiveness of AI writing assistants in improving surface-level accuracy in student writing, there is a lack of in-depth investigation into how these tools impact learner autonomy and engagement with feedback in second language contexts. Most research to date has focused on error correction outcomes or learner perceptions, often neglecting the cognitive and metacognitive processes involved when learners interact with AI-generated suggestions. Additionally, little empirical work has been done to compare the quality and pedagogical value of AI feedback against traditional teacher feedback, particularly in terms of fostering independent writing skills. This study addresses these gaps by examining both the nature of feedback provided by AI tools and their influence on learners' self-regulated

learning behaviors, thus contributing a more comprehensive understanding of how AI affects writing development in English language learning.

METHODS

Research Design

This study employed a mixed-methods research design, combining both quantitative and qualitative approaches to provide a nuanced understanding of how AI writing assistants influenced feedback quality and learner autonomy in English language learning (Creswell & Creswell, 2023). The integration of these methods allowed for triangulation of data, increasing the validity and depth of the findings. Quantitative data offered measurable insights into differences in feedback effectiveness and shifts in learner autonomy, while qualitative data illuminated learner experiences, perceptions, and engagement with the writing process. This approach was particularly suited for investigating the cognitive and pedagogical implications of AI tools in language education, where both observable outcomes and internal learning processes were of interest.

Participants

The participants in this study were approximately 40 English language learners enrolled in university-level academic writing courses. These learners ranged from intermediate to upper-intermediate proficiency, based on their placement test results and previous coursework. Participants were selected using purposive sampling, ensuring they possessed a minimum level of digital literacy and had some prior exposure to AI writing tools, such as Grammarly or ChatGPT. To facilitate comparison, the participants were divided into two groups. One group engaged with AI-generated feedback during the writing tasks, while the other group received traditional teacher-provided feedback. This division allowed for direct analysis of the different feedback types in relation to learner development and autonomy.

Instruments and Materials

A variety of instruments were used to collect comprehensive data for the study. Participants completed two academic writing tasks designed to elicit a range of language use, including grammar, vocabulary, coherence, and argumentation. A feedback evaluation rubric, adapted from established models in second language writing research (Burnell et al., 2023; Nguyen et al., 2024; Yang et al., 2023), was used to assess the quality of feedback provided by both the AI tool and the instructor. This rubric included dimensions such as clarity, accuracy, specificity, and instructional value. In addition, learners completed a Learner Autonomy Questionnaire, based on Self-Regulated Learning (SRL) frameworks, to measure changes in their ability to plan, monitor, and revise their writing independently. To gain deeper insights into learner perceptions and behaviors, semi-structured interviews were conducted with a selected subset of participants from each group. Optional tools such as screen recordings and writing logs were also used with consenting participants to observe how they interacted with feedback during the revision process.

Procedure

The study was conducted over a period of four weeks, structured around two main writing tasks. In the first week, all participants completed a pre-study questionnaire to gather baseline data on their writing habits, attitudes toward feedback, and levels of autonomy. They then completed the first writing assignment, which was analyzed for initial writing ability. Group A used an AI writing assistant to revise their drafts, while Group B received annotated feedback from their instructor. Revisions were collected and evaluated using the feedback rubric. This process was repeated in Week 3 with a second writing task, allowing for consistency in data collection and comparison across time. In the final week, participants completed a post-study questionnaire to identify any changes in their self-regulated learning behaviors. Semi-structured interviews were also conducted with 8–10 participants to provide qualitative reflections on their experiences with feedback and writing development.

Data Analysis

The data collected were analyzed using both quantitative and qualitative techniques. Quantitative data from the feedback rubric and autonomy questionnaires were analyzed using descriptive statistics to summarize trends and paired-sample t-tests to determine whether there were significant differences between the pre- and post-intervention results, as well as between the AI and teacher feedback groups. This provided evidence of any measurable impact on learner autonomy and writing performance. Qualitative data from interviews and optional writing logs were analyzed using thematic analysis (Braun & Clarke, 2021), following a systematic process of coding, categorizing, and interpreting themes that emerged from the learners' reflections and behaviors. This dual-level analysis provided both breadth and depth in understanding how AI writing assistants affected learner engagement, revision practices, and autonomous writing development.

FINDINGS

Findings for Research Question 1: Feedback Quality Comparison

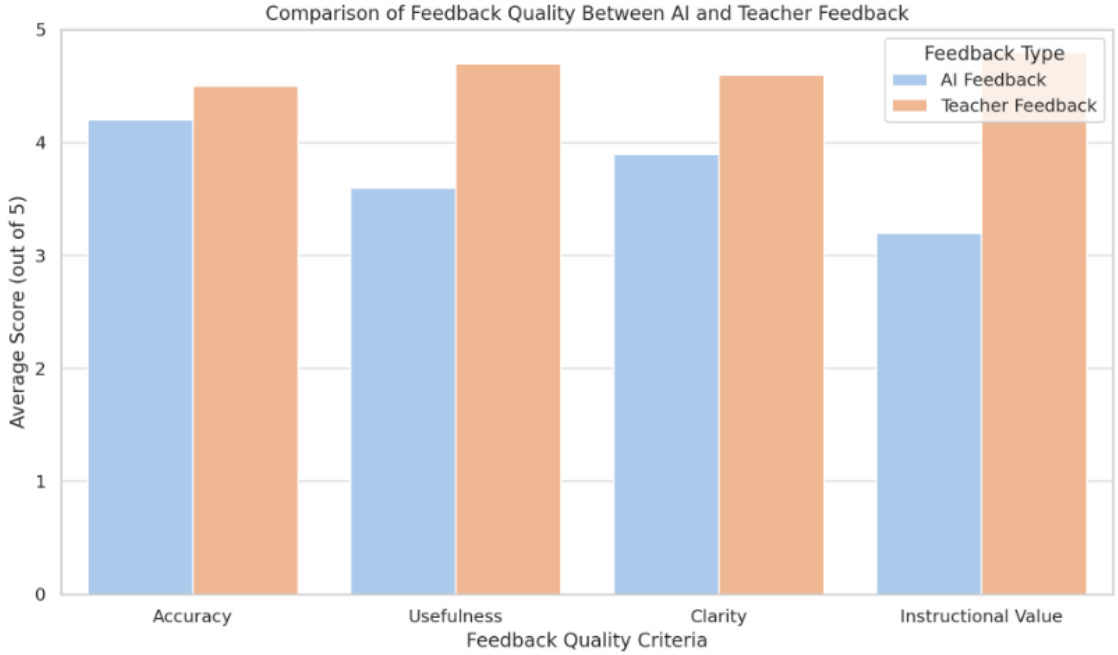
To examine the quality of feedback provided by AI writing assistants versus traditional teacher feedback, this study employed a rubric-based evaluation focusing on four key dimensions: accuracy, usefulness, clarity, and instructional value. Each feedback item was rated on a 5-point Likert scale by two trained evaluators, and inter-rater reliability was established through cross-validation. This dual-evaluation approach ensured both objectivity and consistency in scoring.

As presented in Figure 1, traditional teacher feedback consistently outperformed AI-generated feedback across all assessed dimensions. The most significant disparity emerged in instructional value, where teacher feedback averaged 4.8, compared to the AI's 3.2. This gap is especially important from a pedagogical standpoint: instructional value refers to feedback's ability to not only identify errors but also guide the learner toward conceptual understanding and independent problem-solving. Teacher feedback often included explanations rooted in learning goals, explicit reference to student performance history, and contextualized advice—elements aligned with Vygotsky's (1978) Sociocultural Theory, where such scaffolding mediates learner development within the Zone of Proximal Development (ZPD).

While AI feedback performed reasonably well on accuracy (4.2) and clarity (3.9), indicating its effectiveness at identifying mechanical issues and rephrasing awkward expressions, its usefulness (3.6) and instructional value (3.2) scores suggest a more superficial interaction with the writing content. This confirms earlier concerns that current-generation AI tools, while linguistically proficient, lack the pedagogical awareness needed to adapt feedback to individual learner needs, writing goals, or task-specific nuances. Interviews supported this interpretation, with learners frequently describing AI feedback as "generic," "vague," or "sometimes wrong in academic tone." One participant remarked, *"It catches my grammar mistakes, but it doesn't tell me why something is wrong or how to say it better for academic writing."*

Figure 1

Comparison of Feedback Quality between AI and Teacher Feedback



Interestingly, revision logs revealed a paradox: students in the AI-feedback group revised more frequently than those in the teacher-feedback group. However, the majority of these revisions were cosmetic or surface-level, involving grammatical fixes or word substitutions. The frequency of revision did not correlate with deeper text improvement. Learners often accepted AI suggestions passively, a behavior that aligns with concerns in Self-Regulated Learning (SRL) Theory (Zimmerman, 2002), where overreliance on external feedback—especially when it is decontextualized—can hinder metacognitive development. In contrast, students in the teacher-feedback group were more likely to engage in strategic and reflective revisions, reworking entire paragraphs, reorganizing their argument structure, or elaborating on underdeveloped points. These revisions required cognitive effort and decision-making, suggesting a stronger degree of learner agency and autonomy.

Qualitative data reinforced these behavioural patterns. Students who received teacher feedback frequently described it as "thought-provoking," "motivating," and "more aligned with what I was trying to say." Many appreciated the human tone of encouragement or challenge embedded in the comments, which prompted them to reflect

more deeply on their intentions and audience. In contrast, AI feedback, while appreciated for its speed, consistency, and availability, lacked affective and dialogic dimensions. Several learners admitted to using it more like a proofreading tool than a learning companion.

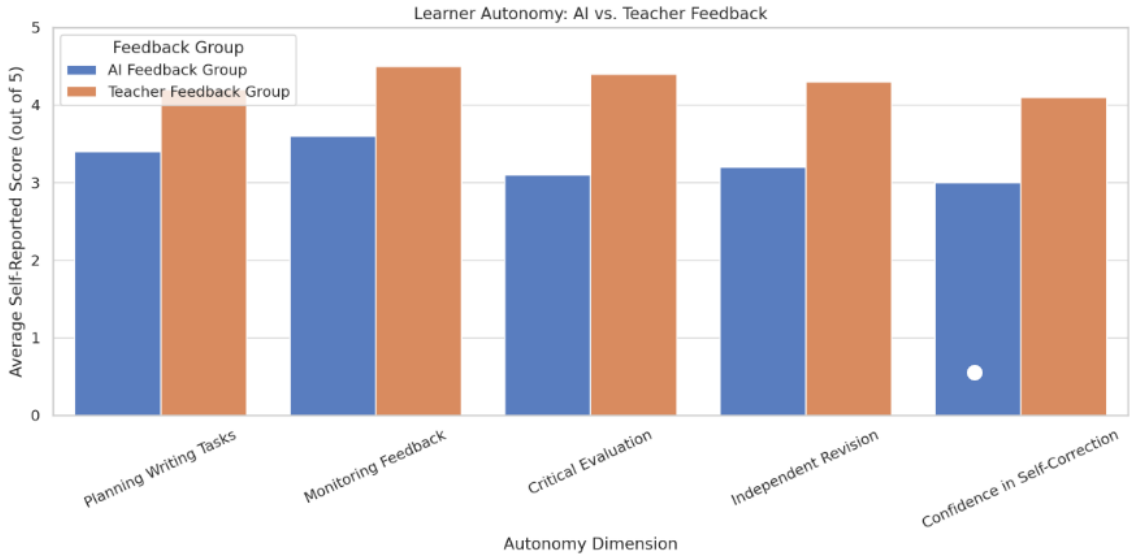
In summary, the findings highlight a complex and layered picture. AI writing assistants excel in efficiency and formal correctness, making them valuable tools for surface-level editing and rapid feedback cycles. However, their current limitations in contextual sensitivity, pedagogical depth, and adaptability to learner needs suggest that they fall short in fostering higher-order writing development and self-regulated learning. Teacher feedback, while slower and resource-intensive, demonstrates significantly greater instructional depth, aligning more closely with established learning theories and learner preferences. These insights suggest that an integrated feedback model, where AI tools handle lower-order issues and teachers provide higher-order guidance, may offer the most balanced and effective approach for supporting writing development in English language learners.

Findings for Research Question 2: Impact of AI Feedback on Learner Autonomy

The second research question explored how the use of AI writing assistants influences learner autonomy, particularly in contrast to teacher-provided feedback. Autonomy was assessed through a post-intervention self-report questionnaire that measured five key dimensions: planning writing tasks, monitoring feedback, critical evaluation of suggestions, independent revision, and confidence in self-correction. Each item was rated on a 5-point Likert scale. Figure 2 illustrates the average scores across these dimensions for both groups.

Figure 2

Comparison of Feedback Quality between AI and Teacher Feedback



As shown in Figure 2, students who received teacher feedback reported higher levels of autonomy across all five dimensions. The most significant gaps occurred in learners' ability to critically evaluate feedback (4.4 teacher vs. 3.1 AI) and confidence in self-correction (4.1 teacher vs. 3.0 AI). These disparities suggest that teacher feedback better

cultivates the internal dialogue necessary for autonomous learning. That is, teacher feedback—often embedded with rationale, prompts for reflection, and nuanced judgment—appears to activate learners' metacognitive processes. Many participants in this group described how comments challenged them to rethink arguments, reassess their word choice, and clarify intent. One student noted: *"When the teacher asked 'What are you really trying to say here?' it made me stop and rethink my whole paragraph."* This reflective disruption is essential in fostering what Zimmerman (2002) terms self-regulated learning—a process where learners actively set goals, monitor their progress, and adjust strategies based on feedback.

In contrast, the AI-feedback group—despite having access to a wide range of suggestions—demonstrated a more mechanical engagement with their revisions. Feedback logs and interviews revealed that students frequently accepted AI suggestions wholesale, often without questioning the rationale or considering the broader context. This behavior reflects a kind of cognitive outsourcing, where learners rely on the tool's authority rather than exercising their own judgment. Although AI may increase revision frequency, this convenience may come at the cost of metacognitive development. Learners become editors of surface features rather than authors engaged in meaning-making.

The lower scores in planning writing tasks (3.4 AI vs. 4.2 teacher) and independent revision (3.2 AI vs. 4.3 teacher) further illustrate how AI tools may unintentionally undermine learner initiative. Several participants in the AI group admitted that they skipped the prewriting phase, assuming that the AI would "clean up" their draft later. This tendency echoes concerns in contemporary studies on automation and skill erosion: when tools are perceived as competent surrogates, human users may disengage from the very cognitive practices the tools are meant to support. In writing, this may translate into a decline in proactive organization, argumentation planning, or structural cohesion—all foundational elements of academic literacy.

Furthermore, the affective dimension of autonomy—confidence in self-correction—was markedly lower in the AI group. While teacher feedback participants expressed growing self-assurance over time, AI users described persistent uncertainty. This was partly attributed to AI's lack of explicit reasoning. As one student remarked, *"It tells me to fix something, but doesn't explain why. Sometimes I follow it, sometimes I don't, but I'm never sure."* In contrast, teacher feedback included justification and tone, which provided a learning context and reassured students of their progress. This underscores the sociocultural value of human mediation: teachers are not just correctors but dialogic partners who co-construct understanding with learners.

Interestingly, despite these limitations, some AI-group participants recognized the tool's potential as a low-stakes revision aid. A few expressed that the non-judgmental nature of AI made it easier to experiment with ideas or ask basic or uncertain questions. This highlights a nuanced insight: while AI may not yet replace teacher scaffolding in promoting deep autonomy, it may serve a complementary function in lowering affective barriers and enabling early-stage drafting.

In sum, the findings indicate that while AI tools offer certain conveniences, they currently lack the pedagogical intelligence required to foster learner autonomy in a holistic sense. Teacher feedback, in contrast, remains more effective in prompting reflective thinking,

encouraging self-monitoring, and nurturing writing independence. These differences are not just quantitative but qualitative: they shape the learner's identity not only as a writer but as an agentive participant in their own learning process. The implications are clear, if AI is to play a meaningful role in language education, it must be integrated intentionally and strategically, with pedagogical structures in place to encourage active, rather than passive, learner engagement.

DISCUSSION

This study investigated two core aspects of AI writing assistants in the context of English language learning: the quality of feedback they provide compared to that of human teachers, and their impact on learner autonomy. The results revealed a consistent pattern—AI tools are proficient at providing quick, surface-level feedback, particularly in grammatical accuracy and clarity, but they fall short in delivering pedagogically rich guidance or fostering deeper learner engagement (Triberti et al., 2024). These findings offer both confirmation and complication of previous studies in the field. The quantitative results showed that while AI-generated feedback performed relatively well in accuracy and clarity, it was notably weaker in usefulness and instructional value. This aligns with studies such as Bonner et al. (2023) and Jyothy et al. (2024), which observed that large language models like GPT can detect and correct grammar errors with impressive speed, but lack the pedagogical reasoning to scaffold learner development effectively. These tools often fail to address higher-order concerns such as argumentation, cohesion, or audience awareness (Jho & Ha, 2024)—areas where teacher feedback traditionally excels.

Moreover, the findings echo Fleckenstein et al. (2023), who cautioned that automated feedback, while efficient, is often "opaque" in its explanations, leaving learners uncertain about the rationale behind suggestions. In this study, participants frequently mentioned that AI feedback lacked contextual understanding and personalization—qualities central to effective feedback according to Hwang et al. (2023). Thus, while AI assistants may reduce workload and provide immediacy, their current limitations reaffirm the importance of human mediation in language instruction.

The second major finding, that learners using AI feedback demonstrated lower levels of autonomy than those receiving teacher feedback, supports and extends theoretical frameworks such as Self-Regulated Learning and Sociocultural Theory. Teacher feedback, often delivered with prompts for reflection and strategic guidance, appeared to help learners internalize metacognitive habits like planning, evaluating, and revising (Z. (Victor) Zhang & Hyland, 2023). In contrast, AI feedback encouraged a more reactive and procedural engagement, where learners followed suggestions without deeper analysis or self-questioning (Shen et al., 2023). These outcomes parallel the concerns raised by Lai and Zheng (2018), who argued that overreliance on automated tools could hinder the development of learner agency. Similarly, Ware and Warschauer (2006) found that students who received computer-generated feedback were less likely to engage in self-monitoring behaviors—a trend replicated in this study's revision logs and interview data. Although the AI group produced more frequent revisions, they were largely mechanical and surface-level, indicating limited critical engagement.

Interestingly, the results also partially support Roscoe and Chi's (2007) notion of "learning by doing", AI users benefited from low-pressure environments that allowed for

more revision experimentation. Some students appreciated the anonymity and immediacy of AI responses, suggesting that AI tools may lower affective filters and promote drafting confidence. However, this benefit was not sufficient to cultivate the deeper reflective autonomy associated with sustained writing development. These findings challenge the increasingly popular discourse that positions AI as a revolutionary tool in language education. While proponents (e.g., Rad et al., 2023) argue that AI can democratize access to personalized writing support, this study suggests a more nuanced view. AI feedback is not inherently "intelligent" in a pedagogical sense, it lacks adaptive scaffolding, sociocultural awareness, and the dialogic nuance that characterizes effective teaching. Unless carefully integrated, it risks promoting surface compliance rather than deep engagement. Furthermore, the results call into question the assumption that more feedback automatically leads to better learning. As X. Zhang and Zhang (2023) argue, feedback must be targeted, explainable, and developmentally appropriate to be effective. The AI tool in this study generated voluminous comments, but without prioritization or explanatory depth, students struggled to derive meaningful learning from them.

Overall, the findings suggest that AI writing assistants should be positioned not as substitutes for teacher feedback, but as complementary tools within a carefully scaffolded feedback ecosystem. Teachers might, for instance, use AI tools to handle routine errors, thereby freeing up time for more complex, developmental feedback. Alternatively, learners could be trained to critically evaluate AI suggestions through reflective checklists or peer discussions, thereby turning the tool into a metacognitive prompt rather than an authoritative corrector. Ultimately, the study underscores that writing development is not just a technical skill to be automated, it is a social, cognitive, and reflective process. As such, any educational technology must be evaluated not just on its efficiency or accuracy, but on its capacity to support meaningful learning and empower learners as active agents in their own growth. While the study offers valuable insights, it is important to acknowledge several limitations. The relatively small sample size and short duration may limit the generalizability of the findings. Future studies could examine how different AI tools or instructional contexts influence feedback effectiveness and learner autonomy. Longitudinal research would also provide deeper understanding of how sustained engagement with AI feedback shapes writing development and self-regulated learning over time.

CONCLUSION

This study has demonstrated that while AI writing assistants offer expedient and accurate surface-level feedback, particularly in areas such as grammar correction, lexical choice, and sentence structure, they fall short in delivering the pedagogical depth and dialogic scaffolding necessary to foster critical engagement and learner autonomy. Teacher feedback, though less immediate, proved more effective in promoting reflective revision practices, self-regulation, and overall writing development. These findings suggest that AI tools, though promising, should function as complements rather than replacements for human feedback in English language learning. Specifically, AI-generated feedback can assist learners in identifying and correcting mechanical or lower-order errors efficiently, thereby freeing teachers to focus on higher-order aspects of writing such as argumentation, organization, and idea development. A well-structured integration of both feedback types could thus maximize the benefits of immediacy and personalization while preserving the reflective depth of teacher mediation. Future research should explore

hybrid feedback models that integrate AI-generated suggestions with teacher guidance, as well as investigate strategies for training learners to critically evaluate and use AI feedback. Longitudinal studies would also be valuable in assessing how sustained exposure to AI tools influences writing development, self-regulated learning, and learner identity over time.

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