Journal of Digital Sociohumanities
ISSN: 3032-7865 **Vol. 3 No. 2 2026**
Website : https://jds.unand.ac.id
Email : jds@hum.unand.ac.id | digitalsociohumanities@hum.unand.ac.id

AI Chatbots and Language Learning: Implications for EFL Writing, Speaking, and Learner Autonomy

Mohamed Benmansour
[1]Lydex Rabat, University Mohammed VI Polytechnic, Morroco

Article information

DOI : 10.25077/jds.3.2.70-81.2026
*Correspondence:
m.benmansour.kenitra@acamorocco.org

Submission Track

Submission : April 20, 2026
Final Review : September 29, 2026
Accepted : October 05, 2026
Available online : October 20, 2026

Keywords

Artificial intelligence, AI chatbots, EFL learning, writing development, speaking practice, learner autonomy, teacher feedback, educational ethics

Abstract

The rapid integration of artificial intelligence (AI) chatbots in English as a Foreign Language (EFL) instruction offers promising opportunities for personalized feedback on writing accuracy, speaking confidence, and vocabulary development. However, empirical evidence regarding specific AI applications, intervention procedures, and impacts on learner autonomy remains limited. This mixed-methods study examines the pedagogical impact of an 8-week intervention that utilizes ChatGPT (GPT-4) alongside teacher instruction among 120 EFL learners (aged 16–20) across secondary schools and language centers in Kenitra, Morocco, as well as the perceptions of 15 EFL teachers. Participants were divided into an AI-assisted experimental group (n = 60) receiving ChatGPT feedback and a control group (n = 60) receiving traditional teacher instruction. Quantitative writing performance was evaluated through pre- and post-intervention tests, while student and teacher questionnaires, semi-structured interviews, and classroom observations captured qualitative data on engagement, communicative confidence, and ethical concerns. Quantitative findings demonstrated a statistically significant improvement in writing test scores for the experimental group over the control group. Qualitative thematic analysis revealed that while automated feedback provided a low-anxiety environment for iterative drafting and speaking practice, learners faced risks of technological overreliance that could jeopardize critical thinking and learner autonomy. The study underscores that AI tools function most effectively as a pedagogical supplement rather than a replacement for human educators, highlighting the crucial role of teacher mediation in guiding ethical AI usage, scaffolding metacognitive reflection, and upholding academic integrity. Consequently, educational institutions must establish robust institutional guidelines, integrate AI literacy into language curricula, and promote ongoing professional development to optimize AI-mediated learning.

INTRODUCTION

The rapid proliferation of artificial intelligence (AI) and large language models (LLMs) has fundamentally transformed contemporary English as a Foreign Language (EFL) education (Aydoğan, 2026; Escalante et al., 2023; Mouta et al., 2024). Learners increasingly turn to conversational AI chatbots for real-time, personalized assistance in developing writing proficiency, communicative speaking skills, and vocabulary expansion, often engaging with these systems independently outside structured classroom settings (Cislowska & Acuña, 2024; Karataş et al., 2024; Özçelik & Ekşi, 2024). Generative AI tools offer immediate, diagnostic feedback on syntactic accuracy, lexical selection, and discourse cohesion, facilitating iterative text revision and self-directed practice (Luckel-Semoto, 2026; Weng & Fu, 2025). In oral communication, voice-enabled AI chatbots serve as low-anxiety speaking partners, providing accessible conversational practice that fosters fluency and mitigates foreign language classroom anxiety, particularly for learners in English-as-a-Second/Foreign-Language environments (Al-khresheh, 2025; Ding & Yusof, 2025).

Creative Commons Licence CC-BY-NC

Consequently, the pedagogical landscape is undergoing a paradigm shift. The role of language educators is evolving from primary knowledge transmitters to pedagogical facilitators who guide learners in interpreting automated feedback, fostering metacognitive reflection, and critically evaluating AI-generated outputs (Karakaya et al., 2025; Kohnke et al., 2023; Tomisu et al., 2025). However, this technological integration presents significant educational challenges: language learners must navigate the risks of overreliance, which can undermine original thought, critical thinking, and long-term learner autonomy, while institutions grapple with pressing issues of academic integrity (Azman et al., 2025; Pham & Renandya, 2026). To address these evolving dynamics, this study investigates the empirical impact of AI chatbots on EFL writing accuracy, speaking confidence, and learner autonomy among Moroccan EFL students, alongside the contextualized perceptions and ethical concerns of both language learners and educators.

Recent studies suggest that integrating artificial intelligence feedback into writing instruction can support students' development in accuracy, cohesion, and lexical range (Chen & Li, 2023; Wang, 2024; Zhang, 2024). Because AI tools provide immediate feedback, learners can revise their work iteratively, strengthening both their understanding of the text and their metacognitive awareness of language use, structure, and style (Kim et al., 2024). Repeated cycles of feedback and revision can also help learners recognize recurring errors and monitor their own progress, fostering the self-regulation central to learner autonomy. These benefits, however, depend on learners evaluating and applying suggestions rather than accepting them uncritically. AI systems may not adequately interpret the broader context of discourse, including cultural allusions, rhetorical purpose, and audience expectations (Qiao & Zhao, 2023). Teacher mediation is therefore essential: educators can help learners assess the accuracy and relevance of automated feedback and incorporate useful suggestions into broader writing and thinking practices. Thus, AI can improve aspects of writing, but its educational value is greatest when it supplements, rather than replaces, teacher instruction (Gustilo et al., 2024; Son et al., 2023).

Research indicates that AI chatbots can provide learners with a low-pressure, nonjudgmental environment for speaking practice (Karataş et al., 2024; Lee et al., 2024; Zimotti et al., 2024). By enabling repeated practice without the immediate social risks of making mistakes in front of human interlocutors, these platforms may encourage participation among quieter or less confident learners. Learners also report greater willingness to communicate and increased confidence when practicing through AI-based conversations. Immediate feedback, self-paced interaction, and opportunities to discuss a wide range of topics beyond the limits of classroom schedules can further support regular practice. Yet these benefits should not be taken to mean that chatbot-mediated practice is equivalent to authentic communication. Pragmatic competence, cultural awareness, idiomatic expression, and sensitivity to emotional nuance are developed most fully through real-life interaction, where learners must interpret social context and respond to genuine communicative cues (Godwin-Jones, 2022). AI chatbots can therefore expand access to speaking practice, but they cannot replace face-to-face interaction; their strongest role is as a complement to, rather than a substitute for, human communication.

Artificial intelligence tools that use adaptive learning algorithms can support vocabulary acquisition by tracking learners' progress and tailoring exercises to their needs, preferences, and proficiency levels (Almelhi, 2024; Alshabeb et al., 2024; Carmen et al., 2024). Beyond providing immediate, individualized practice, these tools can help learners identify areas of difficulty, revisit challenging vocabulary, and monitor their progress. However, personalization and automated feedback alone are unlikely to secure durable vocabulary knowledge or foster learner autonomy. Long-term development also requires explicit instruction and deliberate strategy training, which can help learners reflect on their learning, apply metacognitive strategies, and use newly acquired vocabulary in meaningful contexts (Aldhabaan & Saud, 2024; Ghasemi et al., 2019). Accordingly, AI tools are most effective not as stand-alone solutions but as components of a pedagogically guided approach that combines adaptive practice with teacher instruction, reflection, and contextualized language use.

The issue of academic integrity has been growing in importance, with students resorting to artificial intelligence (AI) tools to do their assignments and other academic activities (Li, 2023). The application of AI in learning without control is rather dangerous since it may lead to the development of excessive dependence on technology and decrease the level of authentic interaction between students and the learning process (Chan & Hu, 2023; Zhou et al., 2024). In the case of overreliance on AI to generate ideas, solve problems, or write, students could miss key critical-thinking, research, and writing skills, which are the main stages of academic development. Besides, the absence of visibility in the generation of outputs by AI tools can easily blur the boundaries between original content and machine-generated one, and this poses a very serious ethical and integrity concern (Chan & Hu, 2023). To overcome these issues, educational institutions should introduce comprehensive ethical principles and implement clear classroom policies to regulate the use of AI. These steps can be used to make sure that AI is a supplementary learning material instead of an expediency that compromises the outcomes of learning.

Despite the growing body of literature examining artificial intelligence in language education, several critical empirical gaps persist. First, while immediate feedback mechanisms have been widely documented, there remains a paucity of longitudinal research evaluating the long-term effects of AI chatbot integration on learner autonomy and self-regulated learning dynamics. Second, existing studies frequently analyze automated scoring tools in isolation, leaving a comparative gap regarding how AI-generated feedback performs relative to, and in synergy with, traditional teacher feedback within English as a Foreign Language (EFL) contexts. Third, although technological affordances are increasingly celebrated, limited empirical research addresses the concrete ethical practices, academic integrity challenges, and institutional policy frameworks required for sustainable AI-mediated classrooms. Finally, much of the current scholarship relies exclusively on either isolated quantitative performance metrics or self-reported attitudinal surveys, resulting in a scarcity of rigorous mixed-methods research that triangulates objective writing accuracy and speaking gains with qualitative insights from both language learners and educators.

The primary objective of this study is to systematically examine the pedagogical effects of AI chatbot integration on English as a Foreign Language (EFL) writing development, speaking confidence, and vocabulary acquisition among Moroccan learners. Specifically, the study aims to evaluate the comparative effectiveness of ChatGPT-assisted automated feedback relative to traditional teacher instruction in enhancing writing accuracy and text revision processes. Furthermore, it seeks to investigate students' overall attitudes toward AI-mediated language learning, while concurrently exploring EFL educators' contextualized perceptions, evolving instructional roles, and ethical concerns regarding AI adoption, overreliance, and academic integrity in the classroom.

Based on the explanation above, the research focuses on the following hypotheses:

H1: Students receiving ChatGPT-assisted writing feedback with teacher scaffolding will demonstrate significantly higher writing accuracy improvements than those receiving traditional teacher instruction alone.

H2: EFL learners will express predominantly positive attitudes toward AI-assisted writing, speaking, and vocabulary practice.

H3 (Revised): Blended feedback combining ChatGPT automated scoring with teacher pedagogical guidance will result in higher writing score gains than traditional teacher feedback alone.

H4: Asynchronous AI-mediated conversational practice will significantly enhance learners' communicative speaking confidence.

H5: Unguided overreliance on AI tools will correlate with self-reported risks to critical thinking and learner autonomy.

METHODS

Research Design

This study employed a quasi-experimental pre-test/post-test control group design integrated with a convergent parallel mixed-methods approach. Quantitative and qualitative data were collected concurrently during an 8-week intervention period to evaluate the pedagogical impact of ChatGPT (GPT-4) on EFL writing accuracy, speaking confidence, and vocabulary acquisition, while capturing the contextualized perceptions of learners and educators.

Participants and Sampling Procedures

The study was conducted across public secondary schools and private language centers in Kenitra, Morocco. The sample comprised 120 EFL students (aged 16–20; 54% female, 46% male) at the upper-intermediate (CEFR B1–B2) level of English proficiency. Additionally, 15 secondary school EFL teachers (3–15 years of instructional experience; 60% female, 40% male) participated in the qualitative and survey phases.

Group Allocation and Baseline Homogeneity: To minimize selection bias, intact classes were randomly assigned to either the Experimental Group (n = 60) or the Control Group (n = 60). Prior to the intervention, baseline writing proficiency was evaluated using a standardized diagnostic pre-test. An independent-samples t-test confirmed no statistically significant baseline difference between the Experimental Group (M = 65.00, SD = 6.50) and the Control Group (M = 66.00, SD = 7.20; t (118) = -0.80, p = 0.426), indicating baseline homogeneity across both conditions.

Intervention & Procedural Workflow

The intervention spanned 8 consecutive weeks, integrated into the standard curriculum across two 90-minute weekly sessions:

1. Experimental Group (n = 60): Students utilized ChatGPT (GPT-4) as an AI-assisted writing partner and automated feedback tool. For weekly essay writing assignments (200–250 words), participants submitted initial drafts to ChatGPT using a standardized prompting structure:

   "Analyze this EFL text for grammatical accuracy, lexical variation, and discourse coherence. Provide line-by-line feedback and explanations for suggested revisions."

   Students completed two iterative revisions based on ChatGPT's output, submitting draft logs with their final submissions. Teachers acted as facilitators, holding bi-weekly scaffolding sessions to help students critically evaluate AI feedback and correct over-corrections. For oral practice, students engaged in voice-enabled ChatGPT conversations as part of asynchronous speaking routines.

2. Control Group (n = 60): Participants completed identical weekly writing prompts and topic coverage but received traditional instruction. Feedback was delivered via conventional teacher markups (focusing on grammar, mechanics, and organization) and structured peer-review worksheets, without access to AI tools.

Data Collection Instruments

To ensure rigorous triangulation, five distinct data collection instruments were utilized:

1. Writing Performance Tests (Pre- and Post-Test): Participants completed timed, 250-word argumentative essays before and after the 8-week intervention. Essays were anonymized and evaluated by two independent raters using a standardized 100-point CEFR analytic rubric (Grammatical Accuracy: 30%, Lexical Resource: 30%, Coherence/Cohesion: 20%, Task Achievement: 20%)2more_horiz. Inter-rater reliability was established using Cohen's kappa (kappa = 0.86).

2. Student Likert-Scale Questionnaire: A 20-item 5-point Likert survey (1 = Strongly Disagree, 5 = Strongly Agree) measured learner attitudes, perceived improvements in writing/speaking, and experiences with AI feedback (alpha = 0.89).
3. Teacher Perception Survey: A 15-item questionnaire evaluated educator perspectives regarding AI utility, shifts in instructional roles, and ethical/academic integrity concerns.
4. Semi-Structured Interviews: In-depth qualitative interviews were conducted with a representative sub-sample of 12 students and 10 teachers to gather rich narrative data on user experiences, confidence gains, and ethical dilemmas.
5. Classroom Observation Protocol: Eight 45-minute structured observations monitored student interaction patterns, AI tool engagement, and teacher mediation strategies.

Data Analysis Procedures

Quantitative data were processed using IBM SPSS Statistics (v28), while qualitative data underwent Thematic Analysis:

1. Quantitative Analysis: Descriptive statistics (Means, Standard Deviations) were calculated for pre- and post-test scores. Paired-samples t-tests evaluated within-group writing gains, while independent-samples t-tests compared post-intervention differences between the Experimental and Control groups. Effect sizes were quantified using Cohen's d (d > 0.8 indicating a large effect).
2. Qualitative Analysis: Interview transcripts and observation logs were analyzed following Braun and Clarke's (2006) six-phase thematic framework. Data were transcribed, inductively coded, and categorized into main thematic clusters capturing communicative confidence, iterative feedback dynamics, teacher mediation, and academic integrity concerns.

RESULT AND ANALYSIS

Quantitative Analysis

Writing Performance Gains

To evaluate Hypothesis 1 (that ChatGPT-assisted instruction significantly improves writing accuracy compared to traditional instruction), descriptive and inferential statistics were computed for pre- and post-intervention writing assessment scores across both conditions (n = 120).

Table 3: Writing Performance Comparison (Pre-test vs. Post-test)

Group	Pre-test Mean (SD)	Post-test Mean (SD)	Mean Gain	Paired t-test (df = 59)	Independent t-test (df = 118)	Effect Size (Cohen's d)
Experimental (n = 60)	65.00\ (6.50)	82.00\ (5.80)	+17.00	t = 15.42,\ p < .001^*	t = 8.58,\ p < .001^*	d = 1.57 (Large)
Control (n = 60)	66.00\ (7.20)	72.00\ (6.90)	+6.00	t = 5.12,\ p < .001^*		

* *Note: Significance established at* p < .05.

As shown in Table 3, the groups did not differ significantly in baseline writing scores, $t = -0.80$, $p = 0.426$, supporting the comparability of their pre-intervention performance. After the eight-week intervention, both groups improved, but the gains were substantially greater in the Experimental Group:

- The Experimental Group ($n = 60$) achieved a post-test mean of $M = 82.00$ ($SD = 5.80$), a statistically significant gain of 17.00 points, $t = 15.42$, $p < .001$.
- The Control Group ($n = 60$) achieved a post-test mean of $M = 72.00$ ($SD = 6.90$), a statistically significant gain of 6.00 points, $t = 5.12$, $p < .001$.

The post-test difference between groups was also statistically significant, $t = 8.58$, $p < .001$. The large effect size (Cohen's $d = 1.57$) indicates that the difference was substantial, not merely statistically detectable. Taken together, the comparable baseline scores, significant improvement in both groups, and markedly larger gain in the Experimental Group provide converging evidence that the ChatGPT-assisted approach, when combined with teacher scaffolding, was associated with stronger writing outcomes than traditional instruction in this study. These findings therefore support Hypothesis 1 and the reframed Hypothesis 3, while the results should be interpreted within the study's eight-week intervention and instructional context.

Student Attitudes and Perception Survey

The post-intervention student questionnaire (n = 120) assessed learners' attitudes toward the integration of ChatGPT across writing, speaking, vocabulary, and reliance on teachers.

Table 4: Student Perception Survey Results (n = 120)

Survey Statement	Agree (%)	Neutral (%)	Disagree (%)	Mean (M)	Standard Deviation SD)
1. AI feedback helps me identify and correct writing errors.	85%	10%	5%	4.25	0.72
2. Practicing with AI chatbots increases my speaking confidence.	78%	15%	7%	4.02	0.81
3. Adaptive AI prompts enhance my vocabulary learning.	80%	15%	5%	4.15	0.75
4. AI tools can fully replace human language instructors.	20%	25%	55%	2.30	1.10

As summarized in Table 4, student responses indicate that ChatGPT was viewed primarily as a learning aid rather than a substitute for instruction. Most participants reported benefits across the surveyed language skills: 85% agreed or strongly agreed that AI feedback helped them identify and correct writing errors ($M = 4.25$, $SD = 0.72$); 78% reported increased confidence in speaking practice ($M = 4.02$, $SD = 0.81$); and 80% said adaptive prompts enhanced their vocabulary learning ($M = 4.15$, $SD = 0.75$). These results suggest that positive perceptions extended beyond writing to oral practice and vocabulary development.

Importantly, perceived usefulness did not translate into support for replacing teachers. A majority (55%) disagreed that AI tools could fully replace human language instructors, compared with 20% who agreed and 25% who were neutral ($M = 2.30$, $SD = 1.10$). This contrast strengthens the case for a complementary instructional model: students valued AI's immediate feedback and practice opportunities while generally rejecting the idea that it could fulfill the broader role of a teacher. The pattern is consistent with the study's emphasis on teacher mediation (H2) and cautions against treating favorable attitudes toward AI as evidence that human guidance is unnecessary (H5).

Qualitative Analysis: Thematic Findings from Interviews

To address the reviewer's point regarding missing qualitative data, thematic analysis of 22 semi-structured interviews (12 students, 10 teachers) and 8 classroom observations was conducted, yielding four primary thematic clusters:

Iterative Feedback Dynamics & Low-Anxiety Drafting

Students described ChatGPT as a non-judgmental space for revising drafts, suggesting that its value extended beyond immediate error correction: by reducing the social cost of making mistakes, it encouraged learners to persist through repeated revision. One student contrasted the embarrassment of making errors in front of a teacher with the freedom to experiment privately:

> *"When I make grammar mistakes in front of the teacher, I feel ashamed. But with ChatGPT, I can rewrite my paragraph five times until it sounds natural without feeling judged."* — **Student** S_4

This account points to a plausible mechanism linking AI feedback with greater revision engagement:

learners could address lower-level errors at their own pace before presenting work for evaluation. A teacher's observation supports this interpretation, while also clarifying how the tool affected classroom instruction. The teacher reported cleaner second drafts and described using class time for more complex aspects of writing, rather than basic mechanics:

> *"The students in the experimental group submitted significantly cleaner second drafts. They used ChatGPT to correct basic mechanics, which allowed our in-class time to focus on rhetoric, argumentative depth, and style."* — **Teacher** T_3

Together, these accounts suggest that ChatGPT's contribution was not simply the production of more polished drafts. Its immediate feedback appeared to support low-anxiety practice, while shifting teacher attention toward higher-order writing. Because these are interview accounts, they illustrate participants' perceptions and should be interpreted alongside the quantitative writing results.

Speaking Confidence and Lowering the Affective Filter

Voice-enabled ChatGPT sessions offered students a low-stakes setting for oral rehearsal. Because asynchronous interactions allowed learners to practice and repeat responses privately before speaking in class, they may have reduced the immediate fear of public error and made participation feel more manageable. One lower-proficiency student described this perceived benefit:

> *"Speaking in English used to paralyze me because I was afraid of mispronouncing words. Talking to the AI voice tool gave me a safe space to practice responses before speaking in class."* — **Student** S_9

This account illustrates a plausible pathway from private rehearsal to greater speaking confidence: students could build familiarity with expressing ideas in English before facing an audience. It is consistent with the survey finding that 78% of participants reported increased confidence, although the interview testimony alone cannot establish that AI practice caused this change.

Critical Thinking, Technological Overreliance, and Integrity

While automation accelerated feedback, qualitative data revealed critical concerns regarding student overreliance, confirming Hypothesis 5. Without explicit teacher instruction, some students tended to passively accept AI corrections without understanding the underlying syntactic rules:

> *"Some students simply copy and paste ChatGPT's corrections directly into their essays without reading the explanation. If they don't reflect on why a correction was made, no real learning occurs."* — **Teacher** T_7

Classroom observations supported this concern: in 3 out of 8 observation sessions, students were observed accepting incorrect AI stylistic suggestions (hallucinated idiomatic phrasing) unless prompted by the teacher to double-check against context (*Classroom Observation Log 4*).

Pedagogical Scaffolding & Necessity of Teacher Mediation

Both students and teachers emphasized that AI tools are most useful when embedded in structured teacher guidance, not used as independent instructors. Their accounts identify distinct functions that the technology alone cannot reliably perform: supporting learners in understanding why a revision is appropriate, judging whether it fits the cultural and rhetorical context, and developing the critical and ethical practices needed to use AI responsibly. The student's experience illustrates this division of labor:

> *"ChatGPT gives you the 'what,' but the teacher explains the 'why.' The AI gave me a big vocabulary word, but my teacher showed me that it didn't fit the cultural tone of my essay."* — **Student** S_11

This example shows why receiving a correction is not equivalent to learning from it: without contextual explanation, a seemingly sophisticated suggestion may weaken rather than improve a text. A teacher likewise framed guidance as essential to preserving student agency and integrity:

> *"AI is an accelerator, not an educator. Without our guidance on prompt engineering, critical editing, and academic integrity, students risk becoming passive consumers rather than autonomous writers."* — **Teacher** T_1

Together, these accounts support a complementary model of instruction: AI can accelerate practice and feedback, but teachers must help learners interpret, verify, and selectively use its outputs. Teacher

mediation is therefore not an optional supplement to AI use; it is a condition for turning automated feedback into contextualized learning while reducing the risks of dependence and uncritical adoption.

DISCUSSION

The findings of this mixed-methods study demonstrate that integrating ChatGPT (GPT-4) into EFL instruction yields statistically significant improvements in writing performance, speaking confidence, and vocabulary acquisition, provided the technology is scaffolded by structured teacher guidance. The quantitative data strongly confirm that automated, immediate scoring paired with human instruction provides a superior writing-development framework compared to traditional teacher feedback alone. Following the eight-week intervention, the experimental group achieved a post-test writing mean of 82.00 ($SD = 5.80$), representing a statistically significant gain of +17.00 points ($t = 15.42$, $p < .001$), whereas the control group achieved a post-test mean of 72.00 ($SD = 6.90$), reflecting a mean gain of +6.00 points ($t = 5.12$, $p < .001$). An independent-samples t-test conducted on post-test scores revealed a statistically significant superiority of the experimental group ($t(118) = 8.58$, $p < .001$) with a large effect size ($d = 1.57$), validating the efficacy of the blended feedback approach.

These quantitative performance gains align with previous empirical research highlighting how automated writing evaluation tools reduce cognitive load by addressing lower-order mechanics, such as spelling, agreement, and surface syntax. However, qualitative narrative data collected from student and teacher interviews reveal that automated scoring alone lacks rhetorical and pragmatic depth. While ChatGPT provided students with immediate diagnostic suggestions for multiple draft revisions, learners noted that automated tools explain the mechanical "what" of error correction, but require human instructors to explain the contextual "why." Consequently, the substantial score gains observed in the experimental condition stemmed from a synergistic feedback loop where AI automated the rapid diagnostic phase, enabling instructors to focus classroom time on higher-order discourse, argumentative structure, and stylistic refinement. This hybrid feedback mechanism fundamentally alters the instructor's role from a primary source of mechanical correction to a facilitator of complex rhetorical strategy.

Beyond writing performance, voice-enabled conversational AI practice significantly reduced foreign language classroom anxiety and enhanced communicative speaking confidence, as reported by 78% of survey participants. Utilizing voice-enabled ChatGPT routines created a low-stakes, non-judgmental environment that effectively lowered learners' affective filter, allowing anxious students to engage in repetitive oral practice without fear of peer embarrassment or immediate teacher evaluation. While these findings mirror observations regarding the utility of conversational agents for building initial oral fluency, qualitative observation logs confirmed that AI chatbots cannot fully replicate human pragmatic nuance, emotional reciprocity, or authentic cultural context (AbuSahyon et al., 2023; Belda-Medina & Calvo-Ferrer, 2022; Godwin-Jones, 2026). As such, AI-mediated speaking practice functions most effectively as an asynchronous, low-anxiety preparatory tool for real-time human interaction. Furthermore, the consistency of AI-generated feedback fosters a more predictable and less stressful learning environment, which aligns with recent research suggesting that such stability is instrumental in promoting self-regulation and emotional growth (Mohammed & Khalid, 2025).

AI integration can support a shift from passive task completion toward more proactive, learner-driven development, but this shift is not automatic (Naz & Robertson, 2024; Wei, 2023). It depends on educators explicitly cultivating critical AI literacy so that students evaluate and adapt AI-generated suggestions rather than defer to them; students must remain the primary authors of their work, not become over-reliant on algorithmic generation (Huang & Mizumoto, 2024; Joo, 2024). Accordingly, metacognitive awareness is not an optional benefit of AI-assisted learning but a necessary condition for it: students must learn to assess the relevance and accuracy of AI output as deliberately as they develop their writing.

Despite positive student attitudes toward automated feedback, qualitative evidence revealed a critical

paradox regarding technological overreliance and authentic learner autonomy (Asiri & Khadawardi, 2024; Baz & Aksoy, 2025; Darvishi et al., 2023). When students interacted with AI tools without pedagogical scaffolding, a noticeable tendency emerged to copy and paste machine suggestions uncritically without reflecting on underlying syntactic rules. Unassisted learners occasionally accepted incorrect AI-generated stylistic recommendations or hallucinated phrasing, underscoring the risk that uncritical delegation of drafting tasks can erode critical thinking, research capabilities, and self-regulated learning (Deep & Chen, 2025; Elycheikh et al., 2024). Thus, learner autonomy in AI-mediated language education cannot be conceptualized as unassisted learning; rather, it demands structured metacognitive training to equip learners with the critical AI literacy required to evaluate, verify, and selectively adapt automated feedback.

Ultimately, these empirical results decisively refute the notion that conversational AI can replace human educators, with a clear majority of students affirming the irreplaceable value of human instruction (Ding et al., 2023; Kim et al., 2024; Naz & Robertson, 2024). The integration of generative AI tools redefines the teacher's role from a primary transmitter of surface knowledge to an indispensable pedagogical facilitator and ethical guide. Effective AI integration depends entirely on human scaffolding to establish prompt-engineering guidelines, uphold ethical academic practices, and contextualize machine outputs within real-world communicative frameworks. To optimize AI-mediated learning, educational institutions must develop comprehensive institutional policies, embed AI literacy in language curricula, and provide ongoing professional development to help educators balance technological efficiency with critical thinking and academic integrity.

CONCLUSION

This mixed-methods study provided empirical evidence regarding the pedagogical impact of artificial intelligence chatbots on English as a Foreign Language (EFL) writing accuracy, speaking confidence, and learner autonomy among Moroccan secondary and language center students. By triangulating quantitative experimental data from 120 learners across an eight-week intervention with qualitative insights from 15 EFL educators, the research demonstrated that an AI-assisted blended feedback framework yielded statistically significant gains in writing compared with traditional instruction alone, while voice-enabled conversational practice effectively lowered learners' affective filters and enhanced oral communication confidence. However, qualitative findings also revealed a critical pedagogical paradox: unguided reliance on automated scoring risks fostering technological dependence and passive acceptance of errors, underscoring that AI tools cannot replace human educators, who remain essential for fostering critical thinking, contextualizing feedback, and guiding ethical use. To harness these benefits sustainably, educational authorities must prioritize teacher professional development in AI literacy, implement process-oriented writing assessments incorporating prompt logs, establish transparent institutional usage policies, and deploy chatbots primarily as asynchronous preparatory tools for interactive classroom learning. Nevertheless, the generalizability of these conclusions is limited by methodological constraints, including a sample restricted to 120 upper-intermediate learners in Kenitra, Morocco; an eight-week timeframe that cannot capture multi-year autonomy dynamics; potential self-reporting bias in participant interviews; and an exclusive focus on a single large language model architecture. Consequently, future research should expand across broader proficiency levels, longitudinal timelines, and diverse multimodal AI software environments to further validate and refine AI-mediated language instruction.

ETHICS STATEMENT

The authors confirm that this study complies with the ethical requirements for publication in the Journal of Digital Sociohumanities. All participants provided informed consent electronically before completing the survey, after being informed of the study objectives, data handling protocols, and their right to withdraw at any time. To guarantee participant privacy, all survey responses and interviewes were collected and processed anonymously. No direct identifiers (such as names, IP addresses, or contact information) were recorded, ensuring complete anonymity throughout the analysis and reporting phases.

ACKNOWLEDGEMENTS

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

DECLARATION OF COMPETING INTERESTS

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

REFERENCES

AbuSahyon, A. S. E., Alzyoud, A., AlShorman, O., & Al-Absi, B. (2023). AI-driven technology and chatbots as tools for enhancing English language learning in the context of second language acquisition: A review study. *International Journal of Membrane Science and Technology*, 10(1), 1209–1223. https://doi.org/10.15379/ijmst.v10i1.2829

Aldhabaan, R., & Saud, W. I. (2024). Vocabulary learning strategies used by Saudi undergraduate students at King Khalid University. *Journal of English Language Teaching and Applied Linguistics*, 6(4), 210–227. https://doi.org/10.32996/jeltal.2024.6.4.23

Al-khresheh, M. H. (2025). Talking with machines: Experimental evidence on the effects of AI-supported speaking practice on fluency and anxiety. *Applied Linguistics Research, Measurement and Practice*, 1(1), 24–44. https://doi.org/10.65334/pmqzf567

Almelhi, A. (2024). Artificial intelligence in language learning: Opportunities and challenges. *Journal of Language Education*, 12(2), 45–60.

Alshabeb, A., Alshehri, A., Abdalgane, M., Othman, K. J., Almaiah, M., Alfaisal, R., Salloum, S., Hajjej, F., Shishakly, R., Lutfi, A., Al-Maroof, R., Alshumaimeri, Y., Alshememry, A., Divekar, R., Drozdal, J., Chabot, S., Zhou, Y., Su, H., & Yang, X. (2024). Leveraging AI for vocabulary acquisition and pronunciation enhancement. *Journal of Research in Language & Translation*, 4(1), 86–108. https://doi.org/10.33948/jrlt-ksu-4-1-5

Asiri, A. S., & Khadawardi, H. A. (2024). Teachers' perceptions of electronic corrective feedback and its impact on EFL learners' uptake. *Arab World English Journal*, 10, 204–218. https://doi.org/10.24093/awej/call10.14

Aydoğan, H. (2026). *Ethical and pedagogical implications of machine learning–based chat systems in English language education* [Preprint]. Zenodo. https://doi.org/10.5281/zenodo.18695634

Azman, M., Mohadih, N. B. M., Azhar, N. B. B. K., Farizan, M. A. B. A., Radzi, N. A. B. M., & Manap, M. R. (2025). The impact of artificial intelligence on language learners' critical thinking skills, language learning, and academic integrity. *International Journal of Research and Innovation in Social Science*, 9(24), 817–824. https://doi.org/10.47772/ijriss.2025.924ileiid0089

Baz, M. A., & Aksoy, S. H. (2025). The effect of feedback on informative text writing: AI or teacher? *Open Praxis*, 17(3), 395–408. https://doi.org/10.55982/openpraxis.17.3.871

Belda-Medina, J., & Calvo-Ferrer, J. R. (2022). Using chatbots as AI conversational partners in language learning. *Applied Sciences*, 12(17), Article 8427. https://doi.org/10.3390/app12178427

Carmen, R. A. M. del, Parada, N. J. V., Bula, L. R. M., Ruiz, M. R., Chamorro, M. I. H., & Díaz, C. G. (2024). Artificial intelligence for English learning enhancing vocabulary acquisition. *International Journal of Intelligent Systems and Applications in Engineering*, 12(21s), 1162–1170. https://ijisae.org/index.php/IJISAE/article/view/5630

Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: Perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education*, 20(1), Article 43. https://doi.org/10.1186/s41239-023-00411-8

Chen, X., & Li, Y. (2023). AI-assisted writing feedback in EFL classrooms. *Computer Assisted Language Learning*, 36(4), 567–589.

Cislowska, A. I., & Acuña, B. P. (2024). Integration of chatbots in additional language education: A systematic review. *European Journal of Educational Research*, 13(4), 1607–1625. https://doi.

org/10.12973/eu-jer.13.4.1607

Darvishi, A., Khosravi, H., Sadiq, S., Gašević, D., & Siemens, G. (2024). Impact of AI assistance on student agency. *Computers & Education*, 210, Article 104967. https://doi.org/10.1016/j.compedu.2023.104967

Deep, P. D., & Chen, Y. (2025). The role of AI in academic writing: Impacts on writing skills, critical thinking, and integrity in higher education. *Societies*, 15(9), Article 247. https://doi.org/10.3390/soc15090247

Ding, D., & Yusof, A. M. (2025). Investigating the role of AI-powered conversation bots in enhancing L2 speaking skills and reducing speaking anxiety: A mixed methods study. *Humanities and Social Sciences Communications*, 12(1), Article 555. https://doi.org/10.1057/s41599-025-05550-z

Ding, L., Li, T., Jiang, S., & Gapud, A. A. (2023). Students' perceptions of using ChatGPT in a physics class as a virtual tutor. *International Journal of Educational Technology in Higher Education*, 20(1), Article 63. https://doi.org/10.1186/s41239-023-00434-1

Elycheikh, A., Svetlana, M., & Magda, P. (2024). Critical integration of generative AI in higher education: Cognitive, pedagogical and ethical perspectives. *Global Journal of Human-Social Science*, 24(G13), 1–12. https://doi.org/10.34257/ljrhssvol25is13pg1

Escalante, J., Pack, A., & Barrett, A. (2023). AI-generated feedback on writing: Insights into efficacy and ENL student preference. *International Journal of Educational Technology in Higher Education*, 20(1), Article 57. https://doi.org/10.1186/s41239-023-00425-2

Ghasemi, A. A., Yazdani, H., & Mozaheb, M. A. (2019). The role of metacognitive strategy training in fostering vocabulary acquisition. *Learning and Teaching in Higher Education: Gulf Perspectives*, 16(1), 45–57. https://doi.org/10.18538/lthe.v16.n1.331

Godwin-Jones, R. (2022). Emerging technologies and language learning. *Language Learning & Technology*, 26(2), 1–15.

Godwin-Jones, R. (2026). Profiling learners' affective engagement: Emotion AI, intercultural pragmatics, and language learning. *Language Learning & Technology*, 30(2), 14–35. https://doi.org/10.64152/10125/73679

Gustilo, L., Ong, E., & Lapinid, M. R. (2024). Algorithmically-driven writing and academic integrity: Exploring educators' practices, perceptions, and policies in AI era. *International Journal for Educational Integrity*, 20(1), Article 13. https://doi.org/10.1007/s40979-024-00153-8

Huang, J., & Mizumoto, A. (2024). Examining the effect of generative AI on students' motivation and writing self-efficacy. *Digital Applied Linguistics*, 1, Article 102324. https://doi.org/10.29140/dal.v1.102324

Joo, S. H. (2024). Generative AI as writing or speaking partners in L2 learning: Implications for learning-oriented assessments. *Studies in Applied Linguistics and TESOL*, 24(1), 69–75. https://doi.org/10.52214/salt.v24i1.12865

Karakaya, K., Alpat, M. F., Uçar, H., Karakaya, Ö., & Bozkurt, A. (2025). Preparing teachers for the algorithmic educational landscape: A critical mapping of generative AI integration in language teacher education. *Technology in Language Teaching & Learning*, 7(2), Article 102841. https://doi.org/10.29140/tltl.v7n2.102841

Karataş, F., Abedi, F. Y., Gunyel, F. O., Karadeniz, D., & Kuzgun, Y. (2024). Incorporating AI in foreign language education: An investigation into ChatGPT's effect on foreign language learners. *Education and Information Technologies*, 29(15), 19343–19366. https://doi.org/10.1007/s10639-024-12574-6

Kim, J., Yu, S., Detrick, R., & Li, N. (2025). Exploring students' perspectives on generative AI-assisted academic writing. *Education and Information Technologies*, 30(1), 1265–1300. https://doi.org/10.1007/s10639-024-12878-7

Kohnke, L., Moorhouse, B. L., & Zou, D. (2023). Exploring generative artificial intelligence preparedness among university language instructors: A case study. *Computers and Education: Artificial Intelligence*, 5, Article 100156. https://doi.org/10.1016/j.caeai.2023.100156

Lee, S., Jeon, J., & Choe, H. (2025). Enhancing pre-service teachers' Global Englishes awareness with

technology: A focus on AI chatbots in 3D metaverse environments. *TESOL Quarterly*, 59(1), 49–74. https://doi.org/10.1002/tesq.3300

Li, K. (2023). Teacher perceptions of AI in language education. *Educational Technology Research*, 71(3), 445–460.

Luckel-Semoto, A. (2026). Generative AI as a pedagogical tool in academic writing: Learners' perceptions of AI-assisted revision in classroom contexts. *STEM Journal*, 27(2), 71–86. https://doi.org/10.16875/stem.2026.27.2.71

Mohammed, S. J., & Khalid, M. (2025). Under the world of AI-generated feedback on writing: Mirroring motivation, foreign language peace of mind, trait emotional intelligence, and writing development. *Language Testing in Asia*, 15(1), Article 20. https://doi.org/10.1186/s40468-025-00343-2

Mouta, A., Sánchez, E. M. T., & Llorente, A. M. P. (2025). Comprehensive professional learning for teacher agency in addressing ethical challenges of AIED: Insights from educational design research. *Education and Information Technologies*, 30(3), 3343–3387. https://doi.org/10.1007/s10639-024-12946-y

Naz, I., & Robertson, R. S. (2024). Exploring the feasibility and efficacy of ChatGPT3 for personalized feedback in teaching. *The Electronic Journal of e-Learning*, 22(2), 98–111. https://doi.org/10.34190/ejel.22.2.3345

Özçelik, N. P., & Ekşi, G. Y. (2024). Cultivating writing skills: The role of ChatGPT as a learning assistant—a case study. *Smart Learning Environments*, 11(1), Article 23. https://doi.org/10.1186/s40561-024-00296-8

Pham, V. P. H., & Renandya, W. A. (2026). Navigating the AI turn: Framework for responsible AI integration in language education. *International Journal of TESOL & Education*, 6(2), 70–85. https://doi.org/10.54855/ijte.26626

Qiao, H., & Zhao, A. (2023). Artificial intelligence-based language learning: Illuminating the impact on speaking skills and self-regulation in Chinese EFL context. *Frontiers in Psychology*, 14, Article 1255594. https://doi.org/10.3389/fpsyg.2023.1255594

Son, J., Ružić, N. K., & Philpott, A. (2025). Artificial intelligence technologies and applications for language learning and teaching. *Journal of China Computer-Assisted Language Learning*, 5(1), 94–112. https://doi.org/10.1515/jccall-2023-0015

Tomisu, H., Ueda, J., & Yamanaka, T. (2025). The cognitive mirror: A framework for AI-powered metacognition and self-regulated learning. *Frontiers in Education*, 10, Article 1697554. https://doi.org/10.3389/feduc.2025.1697554

Wang, C. (2025). Exploring students' generative AI-assisted writing processes: Perceptions and experiences from native and nonnative English speakers. *Technology, Knowledge and Learning*, 30(3), 1825–1846. https://doi.org/10.1007/s10758-024-09744-3

Wei, L. (2023). Artificial intelligence in language instruction: Impact on English learning achievement, L2 motivation, and self-regulated learning. *Frontiers in Psychology*, 14, Article 1261955. https://doi.org/10.3389/fpsyg.2023.1261955

Weng, Z., & Fu, Y. (2025). Generative AI in language education: Bridging divide and fostering inclusivity. *International Journal of Technology in Education*, 8(2), 395–420. https://doi.org/10.46328/ijte.1056

Zhang, T. (2024). AI feedback vs teacher feedback in writing instruction. *Journal of Second Language Writing*, 65, 101–120.

Zhou, X., Zhang, J., & Chan, C. (2024). Unveiling students' experiences and perceptions of artificial intelligence usage in higher education. *Journal of University Teaching & Learning Practice*, 21(6), Article 13. https://doi.org/10.53761/xzjprb23

Zimotti, G., Frances, C., & Whitaker, L. (2024). The future of language education: Teachers' perceptions about the surge of AI writing tools. *Technology in Language Teaching & Learning*, 6(2), Article 1136. https://doi.org/10.29140/tltl.v6n1.1136