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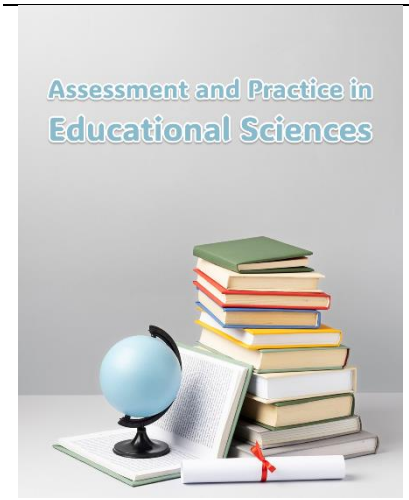

Perspectives of English Language Teachers in Iran on the Role of Artificial Intelligence in Correcting Grammatical Errors

1. Tanin. Tajbakhsh: Department of Linguistics and English Language, Il.C., Islamic Azad University, Ilam, Iran

2. Tayyebeh. Bastholm*: Department of Linguistics and English Language, Il.C., Islamic Azad University, Ilam, Iran (Email: tayyebehkhoshbakht@iau.ac.ir)

3. Ali. Jamali: Department of English Language and Literature, II.C., Islamic Azad University, Ilam, Iran

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ABSTRACT

The present study aimed to investigate the effectiveness of artificial intelligence (AI)-based tools in correcting grammatical errors and to evaluate the perspectives of English as a Foreign Language (EFL) teachers in Iran regarding the opportunities, challenges, and practical implications of integrating these technologies into English language instruction. This study employed a mixed-methods research design combining quantitative and qualitative approaches. The statistical population consisted of Iranian EFL teachers, from whom 41 participants were selected through convenience and purposive sampling. Quantitative data were collected using a researcher-made questionnaire grounded in the Technology Acceptance Model (TAM), measuring perceived usefulness, perceived ease of use, attitudes toward AI, and operational challenges associated with AI implementation. The reliability of the questionnaire was confirmed through Cronbach's alpha coefficients ranging from 0.79 to 0.88. In the qualitative phase, semi-structured interviews were conducted to explore teachers' experiences and perceptions in greater depth. Quantitative data were analyzed using descriptive statistical procedures, while qualitative interview data were examined through thematic analysis to identify recurrent themes related to infrastructural, pedagogical, systemic, and ethical concerns. The findings demonstrated that teachers perceived AI-based grammar correction tools as significantly more effective than traditional correction methods in mechanical and rule-based domains such as punctuation and article usage. AI received substantially higher mean scores in punctuation correction (M = 4.6) and article usage (M = 4.4) compared to traditional approaches. However, no meaningful difference was observed in correcting tense-related errors, while traditional teacher-led methods remained significantly superior in addressing coherence and semantic organization. Thematic analysis further revealed that the most frequently reported barriers to AI implementation were infrastructural limitations, including unstable internet access and inadequate hardware facilities (85%), followed by pedagogical concerns such as students' over-reliance on AI and superficial learning of grammatical concepts (78%). Teachers also emphasized systemic constraints linked to test-oriented educational policies (65%) and ethical concerns including data privacy and algorithmic bias (45%). Overall, the findings indicated a positive but cautious attitude among Iranian teachers toward AI integration in grammar instruction.

Keywords: Artificial Intelligence, English Language Teaching, Grammar Correction, Teachers' Perspectives, Corrective Feedback, Technology Acceptance Model, EFL Teachers, Automated Writing Evaluation.

Introduction

The rapid advancement of artificial intelligence (AI) technologies has fundamentally transformed educational systems across the world, particularly in the field of language learning and teaching. In recent years, AI-powered educational tools such

as intelligent tutoring systems, automated writing evaluation platforms, conversational chatbots, speech recognition applications, and generative language models have increasingly become integrated into English as a Foreign Language (EFL) instruction. These technologies are no longer viewed merely as supplementary digital tools; rather, they are now considered central components of innovative educational ecosystems capable of reshaping how learners acquire linguistic knowledge and how teachers deliver instruction (1, 2). The emergence of advanced generative AI systems such as ChatGPT, Gemini, and AI-driven writing assistants has particularly accelerated discussions concerning the future of language education and the evolving role of teachers in technology-mediated classrooms (3-5).

Grammar instruction and grammatical error correction have traditionally represented some of the most demanding aspects of English language teaching. Teachers often spend extensive amounts of time identifying errors, providing corrective feedback, and guiding students toward grammatical accuracy. This process becomes even more challenging in contexts characterized by overcrowded classrooms, limited instructional time, and exam-oriented curricula. AI technologies offer a potentially transformative solution to these longstanding challenges by automating grammatical analysis and providing immediate, individualized corrective feedback to learners (6, 7). Through natural language processing (NLP), machine learning algorithms, and deep learning architectures, AI systems are capable of detecting spelling, punctuation, syntactic, and semantic errors with increasing levels of sophistication and accuracy (8, 9). Consequently, AI-assisted grammar correction tools are increasingly viewed as promising mechanisms for improving writing quality, enhancing learner autonomy, and reducing teachers' workload.

The integration of AI into language education aligns closely with broader educational transformations associated with digitalization and smart learning environments. Contemporary educational paradigms increasingly emphasize personalized learning, adaptive instruction, and learner-centered approaches. AI systems contribute to these goals by analyzing individual learner performance and tailoring corrective feedback according to students' proficiency levels, weaknesses, and learning needs (10, 11). Intelligent tutoring systems, for instance, can dynamically adjust instructional content and corrective strategies in response to learner progress, thereby creating more flexible and adaptive educational experiences (8, 12). Similarly, AI-powered conversational agents and chatbots facilitate interactive learning opportunities that allow students to engage in authentic language use while simultaneously receiving corrective guidance (9, 13).

A growing body of literature has demonstrated the effectiveness of AI-based educational tools in improving learners' language proficiency, particularly in writing and grammar acquisition. Studies have shown that automated writing evaluation systems and AI-powered feedback mechanisms can significantly reduce mechanical errors and improve grammatical accuracy in students' written production (14, 15). Research on AI-integrated grammar teaching has further revealed that learners often perceive automated feedback as immediate, accessible, and less intimidating than traditional teacher correction, which may positively influence learner confidence and engagement (6, 16). Additionally, AI-driven writing platforms have been found to enhance learners' motivation and self-regulated learning by enabling continuous practice outside classroom settings (4, 15). Such findings suggest that AI technologies possess substantial pedagogical potential in supporting both teachers and learners in EFL contexts.

Despite these advantages, the increasing integration of AI into language education has also generated significant debates concerning pedagogical, ethical, and professional implications. One major concern involves the possibility that learners may become excessively dependent on automated systems, thereby weakening their critical thinking abilities and deep understanding of grammatical structures (17, 18). Critics argue that although AI systems can efficiently correct explicit grammatical errors, they may fail to fully capture contextual meaning, communicative intention, and cultural nuances embedded within language use. Consequently, overreliance on AI-generated feedback could encourage superficial learning

processes in which students prioritize error correction without genuinely understanding linguistic rules (5, 19). These concerns have intensified with the emergence of generative AI systems capable of producing highly fluent and sophisticated written texts that may blur the boundaries between authentic learning and machine-generated production.

Another major issue relates to the changing role of teachers within AI-mediated educational environments. While some scholars argue that AI technologies may eventually replace certain routine teaching tasks, others emphasize that human teachers remain indispensable due to their emotional intelligence, pedagogical judgment, and ability to foster interpersonal communication and learner motivation (5, 20). Human-AI collaboration models propose that AI should function not as a replacement for teachers but rather as an assistive technology that complements human instruction and supports metacognitive development (20). In this perspective, teachers continue to play a critical role in interpreting students' needs, providing contextualized explanations, and maintaining meaningful social interaction within the classroom environment. Thus, understanding teachers' perceptions and attitudes toward AI becomes essential because teachers ultimately determine how and to what extent these technologies are integrated into educational practice.

The success of AI implementation in education depends not only on technological sophistication but also on teachers' technological acceptance and readiness. The Technology Acceptance Model (TAM) has frequently been used to explain educators' adoption of emerging technologies by focusing on perceived usefulness and perceived ease of use as key determinants of behavioral intention (14, 21). If teachers perceive AI systems as useful, accessible, and pedagogically beneficial, they are more likely to integrate them into classroom instruction. Conversely, concerns regarding complexity, reliability, or ethical implications may hinder adoption. Research indicates that teachers' attitudes toward AI are often influenced by contextual variables such as technological infrastructure, institutional support, digital literacy, and educational policy environments (21, 22). Therefore, examining teachers' perspectives in specific educational contexts is necessary to identify both opportunities and barriers associated with AI integration.

In developing educational contexts, the implementation of AI technologies faces additional challenges linked to infrastructural limitations and systemic inequalities. Studies have highlighted that unstable internet access, insufficient digital devices, inadequate teacher training, and limited financial resources significantly constrain the practical integration of AI in schools and universities (2, 23). These problems are especially evident in educational systems where technological modernization has not progressed uniformly across institutions and regions. Furthermore, concerns regarding data privacy, algorithmic bias, and ethical misuse of AI-generated content have emerged as important issues influencing teachers' trust in AI technologies (18, 19). The collection and processing of students' linguistic data by AI systems raise important ethical questions related to confidentiality, surveillance, and fairness. Consequently, teachers may remain cautious about relying extensively on AI applications despite recognizing their pedagogical benefits.

Within the Iranian educational context, English language teaching has historically been shaped by exam-oriented policies, teacher-centered instruction, and limited opportunities for communicative language practice. Teachers often face heavy workloads, large class sizes, and insufficient time for providing individualized corrective feedback to students. Under such conditions, AI-based grammar correction systems could potentially serve as effective educational assistants capable of supporting teachers in managing repetitive correction tasks and enhancing classroom efficiency. However, the Iranian educational environment also presents substantial infrastructural and policy-related barriers that may complicate AI implementation. Issues such as internet restrictions, filtering policies, unequal access to digital resources, and limited institutional support remain major challenges for technology-enhanced learning initiatives. Despite the growing global literature on AI in language education, relatively limited research has specifically explored the perceptions of Iranian EFL teachers regarding the use of AI for grammar correction and writing instruction.

Previous international studies have primarily focused on the effectiveness of AI tools in improving learners' writing performance and motivation rather than examining teachers' attitudes toward these technologies. Research on AI writing correction tools has revealed generally positive perceptions among both teachers and students regarding the speed and convenience of automated feedback (17). Similarly, studies investigating chatbot-assisted learning environments have demonstrated reductions in writing anxiety and increased learner confidence in language production (16, 24). Investigations into AI-powered educational systems have further emphasized their capacity to identify learning difficulties and provide adaptive instructional support (22). However, other studies have simultaneously warned against excessive technological dependence and highlighted the need for balanced integration strategies that preserve meaningful human interaction within educational processes (5, 18).

Moreover, recent developments in generative AI have intensified scholarly interest in understanding how AI-mediated learning environments influence educational motivation, metacognition, and learner autonomy. AI-driven dynamic writing platforms and intelligent feedback systems have been associated with improvements in students' engagement and writing quality (14, 15). AI-assisted speaking evaluation systems and conversational tutoring applications have similarly demonstrated potential for improving speaking confidence and communicative competence among EFL learners (12, 25). Nonetheless, scholars continue to emphasize that educational institutions must carefully consider ethical regulations, pedagogical objectives, and teacher training before integrating such technologies into mainstream educational practice (1, 2).

Given the increasing significance of AI technologies in language education and the relative scarcity of research focusing on Iranian teachers' perspectives, there is a clear need for empirical investigation into how EFL teachers perceive the opportunities and challenges associated with AI-assisted grammar correction. Teachers' beliefs, attitudes, and technological readiness directly influence whether AI systems will be accepted, effectively implemented, or resisted within classroom settings. Understanding these perspectives is therefore essential for informing educational policy, technological development, and teacher training initiatives in Iran. Accordingly, the present study aims to investigate the perspectives of Iranian English language teachers regarding the role of artificial intelligence in correcting grammatical errors, with particular attention to the perceived effectiveness, pedagogical benefits, ethical concerns, and practical challenges associated with integrating AI technologies into EFL instruction.

Methods and Materials

The present study employed a mixed-methods research design to achieve a comprehensive understanding of English language teachers' perspectives regarding the role of artificial intelligence (AI) in correcting grammatical errors. The use of a mixed-methods approach allowed the researchers to integrate both quantitative and qualitative data in order to capture measurable attitudes as well as deeper experiential insights related to the implementation of AI technologies in English language education. The quantitative component focused on measuring teachers' perceptions of the usefulness, ease of use, and effectiveness of AI-based grammar correction systems, whereas the qualitative component aimed to explore participants' lived experiences, concerns, and expectations regarding the integration of AI into classroom instruction. The study followed a concurrent design in which both phases of data collection were conducted within the same research period, and the findings were later integrated during interpretation to enhance the validity and comprehensiveness of the results.

The statistical population of the study consisted of English as a Foreign Language (EFL) teachers working in language institutes, schools, and universities in Iran during the 2025 academic year. Participants were selected using convenience and purposive sampling methods because the study specifically required teachers who possessed familiarity with digital educational technologies and had prior exposure to AI-based grammar correction tools such as Grammarly, ChatGPT, QuillBot, or similar

applications. A total of 41 English language teachers participated in the quantitative phase of the study. Among the participants, both male and female teachers with varying levels of teaching experience were represented to ensure diversity of perspectives. The inclusion criteria required participants to have at least one year of English teaching experience and basic familiarity with online educational technologies. For the qualitative phase, a subset of participants was selected for semi-structured interviews based on their willingness to participate and their experience using AI tools in educational contexts. Prior to participation, all respondents were informed about the objectives of the study, and ethical considerations such as voluntary participation, confidentiality of responses, and anonymity were fully observed throughout the research process.

Data collection in the quantitative phase was conducted using a researcher-developed questionnaire designed according to the principles of the Technology Acceptance Model (TAM) proposed by Davis (1989). The questionnaire was developed after reviewing relevant literature concerning AI integration in language learning and grammar correction technologies. The instrument consisted of 21 items distributed across three main dimensions, including perceived usefulness of AI tools, perceived ease of use, and teachers' attitudes toward AI-assisted grammar correction. The items were designed using a five-point Likert scale ranging from strongly disagree to strongly agree. The perceived usefulness section assessed teachers' beliefs regarding the extent to which AI technologies could improve grammar correction efficiency, reduce workload, and enhance student learning outcomes. The perceived ease of use dimension measured the degree to which teachers considered AI systems simple, user-friendly, and accessible in educational settings. The final dimension evaluated teachers' general attitudes toward adopting AI technologies in English language classrooms, including their willingness to integrate such tools into their teaching practices.

To establish the validity of the questionnaire, the initial draft of the instrument was reviewed by several specialists in applied linguistics, educational technology, and language assessment. Their feedback was incorporated to improve the clarity, relevance, and comprehensiveness of the items. Reliability analysis was subsequently conducted using Cronbach's alpha coefficient. The results indicated satisfactory internal consistency for all sections of the questionnaire, with alpha values ranging between 0.79 and 0.88, while the reliability coefficient for the entire questionnaire exceeded 0.80, demonstrating strong reliability for quantitative measurement.

In the qualitative phase, semi-structured interviews were employed as the primary data collection tool to obtain deeper insights into teachers' perceptions and experiences. The interview protocol included open-ended questions focusing on participants' views regarding the effectiveness of AI in grammar correction, its influence on teacher-student interaction, ethical considerations, infrastructural limitations, and potential risks associated with over-reliance on AI technologies. The semi-structured format provided flexibility for participants to elaborate on their experiences and allowed the researchers to probe emerging themes during the interviews. Each interview was conducted individually in either Persian or English, depending on participant preference, and lasted approximately 30 to 45 minutes. With participants' consent, interviews were audio-recorded and later transcribed verbatim for analysis. The qualitative data collection process continued until thematic saturation was achieved and no substantially new themes emerged from the interviews.

The collected quantitative data were analyzed using statistical software. Descriptive statistical techniques, including frequencies, percentages, means, and standard deviations, were used to summarize teachers' responses regarding the effectiveness and usability of AI tools in grammar correction. Comparative analyses were also conducted to examine differences between teachers' evaluations of AI-based methods and traditional grammar correction approaches across different linguistic domains such as punctuation, article usage, tense correction, and coherence. Reliability analyses using Cronbach's alpha were additionally performed to confirm the internal consistency of the questionnaire scales.

For the qualitative phase, interview transcripts were analyzed using thematic analysis. Initially, the transcripts were read multiple times to ensure familiarity with the data. Subsequently, meaningful statements and recurring patterns were identified

and assigned initial codes. Similar codes were then grouped into broader categories and themes representing teachers' perspectives on the opportunities and challenges of AI integration in English language teaching. Thematic categories extracted from the interviews included infrastructural barriers, pedagogical concerns, systemic educational constraints, and ethical issues related to AI technologies. To enhance the trustworthiness of the qualitative findings, peer review and repeated coding procedures were employed during the analysis process. Finally, the quantitative and qualitative findings were integrated to provide a comprehensive interpretation of teachers' attitudes toward AI-assisted grammar correction in the Iranian educational context.

Findings and Results

A total of 41 English as a Foreign Language (EFL) teachers participated in the present study. Among the participants, 25 teachers (61%) were female and 16 teachers (39%) were male. Regarding teaching experience, 12 participants (29%) had less than five years of teaching experience, 18 teachers (44%) had between five and ten years of experience, and 11 participants (27%) had more than ten years of teaching experience. The demographic distribution indicates that the sample included both novice and experienced teachers, thereby providing a relatively balanced representation of perspectives concerning the integration of artificial intelligence in grammar correction within the Iranian EFL context.

Table 1. Descriptive Statistics of Teachers' Perceptions toward AI-Based Grammar Correction Tools

Variable	N	Mean	Standard Deviation
Perceived Usefulness of AI	41	4.37	0.48
Perceived Ease of Use	41	3.96	0.57
Positive Attitude toward AI Integration	41	4.18	0.52
Perceived Pedagogical Effectiveness	41	4.11	0.46
Concerns about Student Dependency	41	3.89	0.71
Concerns about Ethical Issues	41	3.54	0.76
Concerns about Infrastructure Problems	41	4.42	0.51

The descriptive statistics presented in Table 1 demonstrate that participants generally held highly positive perceptions regarding the usefulness and pedagogical value of AI-based grammar correction tools. The highest mean score was observed for concerns related to infrastructural problems (M = 4.42, SD = 0.51), indicating that teachers strongly believed that limitations such as weak internet connectivity, power outages, and lack of technological equipment constitute serious barriers to the successful implementation of AI technologies in Iranian educational settings. Additionally, teachers reported a very high level of perceived usefulness of AI tools (M = 4.37, SD = 0.48), suggesting that most participants believed AI applications substantially improve the efficiency and speed of grammar correction processes. Positive attitudes toward AI integration were also relatively high (M = 4.18, SD = 0.52), reflecting teachers' willingness to adopt AI technologies in language instruction despite existing concerns. Furthermore, participants rated the pedagogical effectiveness of AI positively (M = 4.11, SD = 0.46), indicating that AI systems are perceived as effective tools for providing immediate corrective feedback and supporting autonomous learning. However, moderate to high concerns were reported regarding student dependency on AI technologies (M = 3.89, SD = 0.71), implying that teachers fear excessive reliance on automated systems may weaken learners' independent grammatical understanding and critical thinking skills. Ethical concerns such as data privacy, algorithmic bias, and reduced human interaction also received moderate ratings (M = 3.54, SD = 0.76), suggesting that although teachers acknowledge the benefits of AI, they remain cautious about its long-term implications in educational environments. Overall, the findings of Table 1 reveal that teachers' perceptions toward AI are generally favorable, but their acceptance is strongly conditioned by infrastructural and pedagogical considerations.

Table 2. Comparison of AI-Based and Traditional Grammar Correction Methods across Different Domains

Grammar Correction Domain	AI Mean Score	Traditional Method Mean Score	t-value	p-value
Punctuation Correction	4.63	3.24	5.81	0.001
Article Usage Correction	4.41	3.53	4.26	0.001
Tense Correction	4.08	3.97	1.14	0.259
Sentence Structure Correction	4.12	4.05	0.76	0.451
Semantic Coherence	3.36	4.57	-5.02	0.001
Contextual Meaning Interpretation	3.22	4.49	-5.47	0.001

The comparative results shown in Table 2 indicate that AI-based grammar correction tools significantly outperformed traditional teacher-led correction methods in mechanical and rule-based linguistic domains. Specifically, AI systems demonstrated substantially higher effectiveness in punctuation correction (M = 4.63) compared to traditional methods (M = 3.24), with the difference reaching statistical significance (t = 5.81, p = 0.001). Similarly, AI tools were rated significantly more effective in correcting article usage errors (M = 4.41) than conventional correction approaches (M = 3.53), suggesting that automated systems are highly capable of detecting and correcting surface-level grammatical inaccuracies. In contrast, no statistically significant differences were observed between AI and traditional methods in tense correction and sentence structure correction, indicating that teachers perceived both approaches as relatively comparable in these areas. However, the results dramatically shifted in domains requiring deeper semantic and contextual understanding. Traditional methods significantly outperformed AI in semantic coherence and contextual meaning interpretation. Teachers rated human-based correction substantially higher for semantic coherence (M = 4.57) than AI systems (M = 3.36), while similar patterns were observed for contextual interpretation. These findings suggest that although AI technologies are highly efficient in identifying explicit grammatical errors, they remain less capable of understanding nuanced contextual meanings, discourse coherence, and communicative intentions embedded within students' writing. Consequently, participants largely viewed AI as a supportive supplementary tool rather than a complete replacement for human teachers, particularly in tasks requiring interpretation, contextual sensitivity, and communicative judgment.

Table 3. Qualitative Themes Extracted from Teachers' Interviews Regarding AI Integration in Grammar Correction

Main Theme	Subtheme	Frequency (%)
Infrastructural Challenges	Weak internet connectivity	85%
	Lack of digital devices in classrooms	73%
	Frequent power outages	69%
Pedagogical Concerns	Student over-reliance on AI	78%
	Superficial learning of grammar rules	74%
	Reduced teacher-student interaction	67%
Systemic Constraints	Exam-oriented educational system	65%
	Limited institutional support	58%
Ethical Concerns	Data privacy risks	45%
	Algorithmic bias and inaccuracies	39%
Positive Educational Outcomes	Immediate corrective feedback	88%
	Reduction of teachers' workload	82%
	Promotion of autonomous learning	76%

The thematic analysis of the semi-structured interviews generated several important themes concerning teachers' perceptions of AI integration in grammar correction. As shown in Table 3, the most frequently discussed issues were related to infrastructural challenges. A substantial majority of participants identified weak internet connectivity (85%), lack of technological devices (73%), and frequent electricity outages (69%) as major barriers preventing the effective implementation of AI tools in educational environments. These findings indicate that infrastructural limitations remain the most critical obstacle

to technological integration in the Iranian educational system. In addition to infrastructural barriers, pedagogical concerns were also strongly emphasized by participants. Approximately 78% of teachers expressed concerns regarding students' excessive dependence on AI systems, while 74% believed that automated correction may encourage superficial learning and reduce students' deep understanding of grammatical principles. Furthermore, 67% of participants reported that increased reliance on AI could weaken direct teacher-student interaction, which is considered essential for developing communicative competence and learner motivation. Systemic constraints also emerged as an important theme, with teachers emphasizing that the highly exam-oriented structure of the Iranian educational system limits opportunities for implementing AI-supported writing instruction. Many participants believed that educational policymakers continue to prioritize standardized testing over communicative and technology-enhanced learning approaches. Ethical concerns such as data privacy risks and algorithmic bias were additionally identified, although they appeared less frequently compared to infrastructural and pedagogical issues. Despite these challenges, participants also highlighted several important educational benefits associated with AI technologies. Most teachers acknowledged that AI tools provide immediate corrective feedback, significantly reduce repetitive correction tasks, and promote autonomous learning among students. Overall, the qualitative findings reinforce the quantitative results by demonstrating that teachers generally maintain a positive attitude toward AI technologies while simultaneously recognizing substantial practical and pedagogical challenges that must be addressed before large-scale implementation can occur in Iranian English language classrooms.

Discussion and Conclusion

The findings of the present study revealed that Iranian EFL teachers generally hold positive attitudes toward the integration of artificial intelligence in grammatical error correction and English writing instruction. Quantitative results demonstrated that teachers perceived AI-based grammar correction tools as highly useful, particularly in identifying mechanical and rule-based errors such as punctuation and article usage. At the same time, qualitative findings indicated that participants valued the speed, immediacy, and efficiency of automated corrective feedback. These findings align with previous research emphasizing the effectiveness of AI-powered writing systems in improving grammatical accuracy and supporting language learning processes (3, 14). Similar studies have shown that AI writing assistants can substantially reduce repetitive correction tasks and provide learners with immediate feedback, thereby enhancing both instructional efficiency and learner autonomy (4, 15). The positive perceptions observed in the current study suggest that teachers increasingly recognize AI as a supportive educational technology rather than merely a technological novelty.

One of the most important findings of this research was the significantly higher evaluation of AI systems in correcting surface-level grammatical errors compared to traditional correction methods. Teachers reported that AI tools were particularly effective in detecting punctuation mistakes, article misuse, and other explicit linguistic inaccuracies. This result is highly consistent with studies demonstrating that natural language processing technologies and deep learning algorithms perform efficiently in identifying mechanical and syntactic errors in learner writing (8, 9). AI-based writing systems operate through extensive linguistic datasets and predictive language models that allow them to identify patterns of incorrect usage rapidly and accurately. Similar findings were reported by Küçük, who found that AI-integrated grammar instruction enhanced grammatical precision and accelerated feedback processes in preparatory language programs (6). Therefore, the findings of the present study reinforce the argument that AI systems can effectively complement traditional grammar instruction by automating repetitive corrective tasks and enabling teachers to allocate greater attention to higher-order aspects of writing instruction.

However, despite recognizing the efficiency of AI technologies in mechanical correction, teachers in the present study strongly emphasized that AI systems remain weaker than human instructors in addressing semantic coherence, contextual

interpretation, and communicative meaning. Traditional teacher-led correction methods received significantly higher evaluations in areas requiring deep understanding of discourse organization and contextual appropriateness. This finding supports previous literature suggesting that AI systems continue to face limitations in interpreting nuanced linguistic meanings and cultural contexts (5, 19). Although generative AI technologies have become increasingly sophisticated, human teachers possess contextual awareness, emotional intelligence, and pedagogical sensitivity that machines currently cannot fully replicate. Similar concerns were highlighted by Xie, who argued that AI technologies create both opportunities and challenges in second language teaching because automated systems cannot completely replace human judgment in communicative language education (18). Consequently, the current findings support the "Human-in-the-Loop" perspective, which proposes that AI should function as a complementary educational assistant rather than a replacement for teachers.

Another important finding concerned teachers' concerns about students' over-reliance on AI technologies. A substantial proportion of participants believed that excessive dependence on automated correction tools may encourage superficial learning and reduce learners' genuine understanding of grammatical principles. Teachers expressed concern that students might simply accept AI-generated corrections without critically analyzing the underlying linguistic rules. This finding is consistent with previous studies warning that overreliance on generative AI could weaken metacognitive engagement and critical thinking abilities among learners (19, 20). While AI systems provide immediate corrective feedback, learners may become passive recipients of automated suggestions rather than active participants in the learning process. Putra similarly reported that although teachers and students generally appreciated AI writing correction tools, concerns remained regarding reduced independent problem-solving and diminished cognitive effort during writing activities (17). Therefore, the present study suggests that pedagogical strategies integrating AI should emphasize reflective learning and teacher-guided analysis rather than mere automated correction.

The findings also revealed significant concerns regarding the reduction of teacher-student interaction in AI-mediated classrooms. Participants feared that excessive use of automated systems could weaken interpersonal communication and reduce opportunities for meaningful classroom engagement. This issue is particularly important in language education because communicative interaction plays a central role in developing speaking, writing, and social communication skills. Previous literature similarly emphasizes that language learning is not solely a cognitive process but also a deeply social and interactive activity (1, 5). Human teachers contribute motivational support, emotional encouragement, and contextual explanations that extend beyond grammatical correction. Hawanti found that AI chatbots could alleviate learners' anxiety and increase confidence; however, the study also acknowledged that emotional support and social interaction provided by teachers remain irreplaceable (16). Therefore, while AI technologies may enhance efficiency, balanced integration remains necessary to preserve human-centered dimensions of language education.

The present study additionally highlighted major infrastructural barriers influencing teachers' willingness and ability to implement AI technologies in Iranian educational settings. Weak internet connectivity, limited access to digital devices, and frequent technological disruptions were identified as the most significant obstacles to AI integration. These findings are highly consistent with studies conducted in developing educational contexts, which emphasize that technological inequality and infrastructural deficiencies substantially limit the adoption of AI-assisted learning systems (2, 23). Unlike educational institutions in technologically advanced countries, many Iranian schools and language institutes lack the digital infrastructure required for effective AI implementation. The findings therefore indicate that technological innovation alone cannot guarantee successful educational transformation unless accompanied by infrastructural development and institutional support. Wang similarly emphasized that AI-powered educational systems require reliable technological ecosystems and effective data infrastructures to function successfully in educational settings (22).

Systemic and policy-related constraints also emerged as important themes in the current research. Teachers reported that the exam-oriented nature of the Iranian educational system limits opportunities for implementing AI-assisted writing instruction. Since standardized examinations primarily emphasize memorization and multiple-choice assessment formats, many teachers feel pressured to prioritize test preparation over communicative writing development. This finding corresponds with previous research suggesting that educational policy environments strongly influence teachers' willingness to adopt innovative instructional technologies (11, 21). AI technologies are often most effective in environments that support process-oriented learning, individualized feedback, and student-centered instruction. However, rigid curriculum structures and examination systems may discourage teachers from experimenting with technologically enhanced pedagogical approaches. Consequently, meaningful AI integration requires not only technological readiness but also broader educational reforms that encourage communicative and interactive language learning practices.

Ethical concerns represented another important dimension of teachers' perceptions in the present study. Participants expressed concerns regarding data privacy, algorithmic bias, and the possibility of students misusing AI technologies for plagiarism or unauthorized content generation. These findings are consistent with broader global discussions surrounding ethical challenges associated with generative AI in education (1, 19). AI systems often require extensive data collection and processing, raising concerns regarding confidentiality and surveillance. Furthermore, algorithmic biases embedded within AI models may produce inaccurate or culturally inappropriate feedback, particularly for non-native English learners. Such concerns indicate that teachers' acceptance of AI technologies depends not only on perceived usefulness but also on trust in the ethical reliability and fairness of these systems. Therefore, educational policymakers and software developers must address ethical regulations and transparency issues to ensure responsible AI implementation in language education.

Despite these concerns, the findings of the present study ultimately demonstrate that Iranian EFL teachers generally perceive AI technologies as valuable educational tools capable of enhancing grammar correction efficiency, reducing teacher workload, and supporting learner autonomy. These findings align with studies demonstrating positive relationships between AI-supported instruction and learner motivation, confidence, and engagement (4, 15). Teachers acknowledged that AI systems enable students to receive immediate feedback and practice writing skills independently outside classroom settings. Similarly, conversational AI systems and intelligent tutoring platforms have been shown to facilitate flexible, adaptive, and learner-centered educational experiences (8, 12). Therefore, the current findings reinforce the growing scholarly consensus that AI technologies possess significant pedagogical potential when implemented thoughtfully and responsibly.

Overall, the results of this study suggest that the future of AI in language education should be conceptualized through collaborative rather than replacement-oriented models. Teachers continue to occupy an essential pedagogical role in facilitating communicative competence, contextual understanding, emotional engagement, and critical reflection. AI systems can effectively assist teachers by automating repetitive correction processes and providing supplementary individualized feedback, but they cannot fully substitute human instructional expertise. This conclusion strongly supports the arguments presented in recent literature emphasizing the importance of balanced Human-AI collaboration in smart educational environments (5, 20). Consequently, the successful implementation of AI in Iranian EFL classrooms requires comprehensive strategies that integrate technological infrastructure development, teacher digital literacy training, ethical regulation, and pedagogically informed instructional design.

One limitation of the present study was the relatively small sample size, which may reduce the generalizability of the findings to all EFL teachers across different educational regions and institutional contexts in Iran. Additionally, the use of convenience and purposive sampling may have introduced selection bias because participants who were more familiar with educational technologies may have been more willing to participate in the study. Another limitation concerns the reliance on

self-reported perceptions rather than direct classroom observations or experimental measures of AI effectiveness. Teachers' attitudes may not always accurately reflect their actual classroom practices. Furthermore, the rapidly evolving nature of AI technologies means that teachers' perceptions may change over time as newer and more sophisticated AI systems emerge. Finally, infrastructural differences among schools and institutions may have influenced participants' responses regarding accessibility and usability of AI technologies.

Future studies should examine larger and more diverse samples of teachers from different provinces, educational institutions, and academic levels to enhance the generalizability of findings. Longitudinal studies are also recommended to investigate how teachers' perceptions and classroom practices evolve over time with increased exposure to AI technologies. In addition, future researchers may conduct experimental studies comparing student learning outcomes in AI-supported and traditional grammar instruction environments. Investigating students' perspectives toward AI-assisted grammar correction would also provide valuable insights into the effectiveness and acceptance of these technologies from the learner viewpoint. Further qualitative research focusing on ethical issues, teacher identity transformation, and emotional dimensions of Human-AI interaction in educational contexts could contribute to a deeper understanding of the broader implications of AI integration in language learning.

Educational policymakers should prioritize the improvement of technological infrastructure in schools and language institutes before mandating the implementation of AI technologies in language education. Reliable internet access, adequate digital devices, and technical support systems are essential prerequisites for successful AI integration. Teacher training programs should also be developed to improve educators' digital literacy and pedagogical understanding of AI-assisted instruction. Rather than replacing teachers, AI technologies should be integrated as supplementary tools that support classroom interaction, individualized feedback, and learner autonomy. Software developers are encouraged to design AI systems capable of providing explanatory feedback rather than merely identifying errors so that students can better understand grammatical concepts. Finally, educational institutions should establish ethical guidelines regarding data privacy, academic integrity, and responsible AI use in order to ensure safe and balanced implementation of AI technologies in English language teaching contexts.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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