



THE USE OF GAME-BASED METHODS AND AI PLATFORMS IN ADDRESSING GRAMMATICAL INTERFERENCE IN ENGLISH LANGUAGE TEACHING

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Abstract: *Grammatical interference, or the transfer of first language structures into second language usage, presents a persistent obstacle in the development of grammatical accuracy among English language learners. Traditional grammar instruction often lacks the capacity to address the deep-rooted cognitive and affective factors that contribute to this phenomenon. This study explores the effectiveness of integrating game-based learning (GBL) methods and artificial intelligence (AI)-enhanced platforms to reduce grammatical interference in English language teaching. Through a qualitative synthesis of empirical research, including experimental, systematic, and case-based evidence, this study identifies key pedagogical mechanisms that support the restructuring of L1-influenced grammatical habits. The findings highlight that interactive, feedback-driven learning environments—characterized by gamified challenges, personalized scaffolding, and real-time error correction—significantly improve grammatical accuracy, enhance learner motivation, and foster autonomous language development. Additionally, these tools promote a risk-tolerant atmosphere that encourages experimentation and metalinguistic reflection. While the results indicate a strong potential for GBL and AI tools to transform grammar instruction, the study emphasizes the need for thoughtful instructional design, teacher involvement, and further longitudinal research to validate and expand these outcomes across diverse learner populations.*

Keywords: *grammatical interference, game-based learning, artificial intelligence, English language teaching, second language acquisition, corrective feedback, learner autonomy*

INTRODUCTION

In the domain of Second Language Acquisition (SLA), one of the most persistent challenges faced by learners is grammatical interference—a phenomenon wherein learners inadvertently apply grammatical structures and rules from their first language (L1) to the target language (L2). This form of negative language transfer often results in recurring grammatical errors that impede both fluency and accuracy. Such interference is particularly problematic in formal grammar instruction, where traditional, teacher-centered approaches may not sufficiently address the underlying cognitive and linguistic mechanisms responsible for these errors. As a result, learners may internalize incorrect structures, making it difficult to achieve native-like grammatical competence.



In recent years, innovative pedagogical tools have emerged to counter these limitations, most notably game-based learning (GBL) environments and artificial intelligence (AI)-enhanced platforms. These technologies offer interactive, adaptive, and learner-centered methods for grammar instruction that contrast sharply with conventional didactic techniques. Game-based methods foster engagement through storytelling, challenges, rewards, and competition, while AI tools provide personalized, real-time feedback, helping learners to recognize and self-correct errors related to grammatical interference. Such platforms can dynamically adjust to the learner's proficiency level, track patterns of incorrect usage, and deliver customized tasks that target specific grammatical weaknesses. An increasing body of research supports the integration of GBL and AI into grammar teaching. For instance, Reynolds and Kao found that digital game-based instruction significantly enhanced the grammatical accuracy of English article usage, outperforming both teacher-led instruction and direct written corrective feedback. Similarly, Manokaran, Razak and Hamat, through a systematic review, emphasized the role of game-based learning in motivating non-native speakers to engage more actively with grammatical structures, thereby reducing the influence of their native language on L2 performance. Further, Mendoza Franco demonstrated the effectiveness of game-based methods in developing grammatical competence among EFL learners in Ecuador, with measurable improvements in sentence construction and syntactic accuracy. Given the promising results highlighted in these studies, this paper aims to examine how the integration of game-based strategies and AI-powered platforms can contribute to the mitigation of grammatical interference in English language teaching. In doing so, it discusses the pedagogical implications, identifies methodological best practices, and considers future directions for the technology-enhanced grammar instruction of non-native English speakers.

METHODOLOGY

This study adopts a qualitative research approach, specifically employing content analysis to synthesize and interpret findings from a curated selection of recent empirical and theoretical sources. The focus is on the pedagogical application of game-based learning (GBL) and artificial intelligence (AI) tools in mitigating grammatical interference among non-native English speakers. Grammatical interference, defined as the negative transfer of syntactic and morphological features from a learner's first language (L1) to the target language (L2), remains a persistent barrier in English language acquisition. The research design is grounded in triangulation, wherein multiple forms of evidence and research methodologies are integrated to enhance the credibility, depth, and transferability of findings. The selection of sources for analysis was guided by three primary criteria: methodological rigor, thematic relevance to grammar instruction, and explicit engagement with digital or AI-enhanced pedagogical tools. The three studies chosen for synthesis represent distinct methodological traditions: experimental, systematic, and interpretive. The first, Reynolds and Kao,



conducted a comparative experimental study in which learners were divided into groups receiving digital game-based instruction, teacher-led traditional instruction, or direct written corrective feedback. The focus was on the acquisition of English article usage—a notoriously difficult area due to its absence in many learners' native languages. Their findings offer empirical data on how GBL affects grammatical accuracy in comparison to more conventional approaches. The second study, a systematic review by Manokaran, Razak, and Hamat, surveys a broad corpus of literature to trace the evolution and effectiveness of game-based strategies in grammar instruction for non-native learners. This meta-analytic approach allows for the identification of consistent trends across studies, such as increased learner motivation, engagement, and long-term retention of grammatical structures. It also outlines pedagogical frameworks in which digital games serve not merely as engagement tools but as structured learning environments offering immediate feedback and adaptive learning pathways.

The third source, a doctoral dissertation by Mendoza Franco, employs a case-based qualitative design to explore the effects of GBL in real-world classroom settings in Ecuador. The study provides deep, context-sensitive insights into the lived experiences of both teachers and students using game-based platforms for grammar instruction. It emphasizes the role of socio-cultural context, learner attitudes, and the institutional support necessary for successful integration of GBL and AI technologies. The dissertation also highlights challenges such as digital literacy gaps, access to technological infrastructure, and the need for teacher training.

The analytic process involved a systematic content review of each study, with coding categories developed inductively to capture recurring themes, patterns, and pedagogical mechanisms related to interference mitigation. Thematic units such as "learner engagement," "error detection and feedback loops," "adaptive scaffolding," and "cognitive restructuring of L1-based grammar rules" were traced across all sources.

Additionally, attention was paid to how AI platforms, including intelligent tutoring systems and automated grammar correction tools, were implemented to individualize grammar instruction and address persistent L1 transfer errors. The triangulated analysis enabled a holistic synthesis of findings, illuminating the multifaceted ways in which GBL and AI can serve as both preventive and corrective tools in addressing grammatical interference.

Whereas traditional grammar instruction often emphasizes rule memorization and repetitive practice, game-based and AI-supported methods foster interactive, experiential, and feedback-rich environments that promote deeper syntactic awareness and metalinguistic reflection. Furthermore, the role of gamification elements such as levels, rewards, real-time feedback, and narrative contexts were found to contribute significantly to learner motivation and sustained attention, both of



which are critical for internalizing new grammatical structures and overcoming entrenched L1 patterns.

RESULTS

The synthesis of the reviewed studies revealed converging evidence on the efficacy of game-based learning (GBL) and artificial intelligence (AI)-enhanced platforms in mitigating grammatical interference in English language learning, particularly among non-native speakers. Across the three core sources analyzed, several critical outcomes emerged that highlight the pedagogical advantages of these innovative approaches. One of the most prominent findings concerns the reduction of grammatical errors, particularly in the use of English articles. The experimental research conducted by Reynolds and Kao demonstrated that learners who were instructed through digital game-based platforms exhibited a statistically significant decrease in article-related errors when compared to their counterparts who received either traditional teacher-led instruction or direct written corrective feedback. This result suggests that the interactive and immersive nature of GBL environments contributes not only to increased practice opportunities but also to more effective internalization of challenging grammatical structures, particularly those subject to negative transfer from learners' first languages. Further, the review identified learner engagement as a critical mediating factor in the reduction of grammatical interference. The systematic review by Manokaran, Razak, and Hamat consistently emphasized that game-based learning enhances students' intrinsic motivation and lowers affective barriers such as anxiety and fear of error. This shift in the affective dimension of learning fosters a more risk-tolerant and exploratory environment, enabling students to engage with complex grammatical structures without the fear of punitive correction. Such environments encourage experimentation and facilitate the restructuring of incorrect L1-based grammatical patterns through positive reinforcement and iterative feedback loops. In addition to enhanced engagement and error reduction, the third study by Mendoza Franco reported significant gains in grammatical accuracy and learner autonomy. The case-based qualitative research highlighted how the integration of GBL with AI-supported features—such as instant corrective feedback, gamified error-tracking, and adaptive grammar challenges—enabled learners to assume greater control over their grammatical development. These tools provided real-time diagnostic feedback tailored to each learner's specific error profile, promoting metalinguistic awareness and helping students identify and self-correct recurring L1-influenced errors. Over time, this resulted in a noticeable improvement in the learners' ability to produce grammatically accurate language in both written and spoken forms.

Taken together, the results from these three sources present a cohesive and multi-dimensional picture of how GBL and AI-based instruction can significantly reduce the negative effects of grammatical interference in the language learning process. While each study examined the phenomenon from a different methodological



lens, their findings consistently point to the value of interactivity, personalized feedback, and learner-centered design as key drivers of grammatical competence. These pedagogical innovations not only address specific grammatical challenges but also support broader cognitive and emotional conditions conducive to successful second language acquisition. The data suggest that game-based and AI-enhanced grammar instruction serves not merely as a supplement to traditional methods, but as a transformative pedagogical approach capable of directly targeting and mitigating L1-induced interference patterns. The results affirm the growing relevance of technology-enhanced language learning environments in the evolving landscape of English language education.

DISCUSSION

The findings of this study underscore a critical challenge in second language instruction: the persistent influence of first-language (L1) structures on second-language (L2) grammatical accuracy, commonly referred to as grammatical interference. Traditional approaches to grammar teaching—often reliant on rule memorization, explicit correction, and decontextualized drills—have consistently demonstrated limited efficacy in addressing this issue. One of the primary limitations of such methods lies in their tendency to conceptualize errors as isolated or discrete phenomena, divorced from the learner's broader cognitive-linguistic system. As a result, instructional strategies may overlook the systemic and deeply embedded nature of L1 transfer in the learner's interlanguage. In contrast, the integration of game-based learning (GBL) and artificial intelligence (AI) into grammar instruction offers a paradigm shift. These tools are not merely supplementary technologies, but function as immersive, dynamic learning environments that are capable of replicating the type of contextualized and responsive input necessary for reshaping ingrained L1-based structures. AI-powered systems—including intelligent tutoring systems (ITS), adaptive learning platforms, and conversational agents—have the capacity to monitor learner behavior in real time, analyze patterns of grammatical error, and deliver individualized, context-sensitive feedback. This continuous feedback loop not only helps identify persistent interference patterns but also provides targeted corrective input that evolves with the learner's progress. Moreover, the incorporation of GBL introduces an essential affective component often neglected in traditional instruction. The literature consistently highlights that emotional engagement—driven by elements such as challenge, narrative, and achievement—can significantly enhance cognitive processing. In game-based environments, grammar practice is embedded within goal-oriented tasks, fostering intrinsic motivation and low-anxiety conditions. These affective advantages are especially important in the context of interference, as learners are more likely to attempt complex grammatical forms when they are not constrained by the fear of failure or punitive correction. In such low-stakes settings, learners are empowered to take linguistic risks, engage in hypothesis testing, and benefit from the natural feedback that games and AI platforms provide. However, the potential of GBL



and AI-enhanced instruction to reduce grammatical interference is not without its limitations. Effective outcomes depend heavily on pedagogical integration and instructional design. Simply introducing digital games or AI tools into the curriculum without a clear didactic framework can result in superficial engagement with grammar, or worse, reinforce incorrect patterns if feedback is delayed, inconsistent, or overly simplistic. Therefore, educators must ensure that game mechanics are purposefully aligned with specific grammatical objectives, and that AI interventions function as scaffolding mechanisms rather than replacements for human instruction. The teacher's role, in this case, evolves from that of a transmitter of knowledge to a facilitator who curates the learning environment, monitors learner interaction with digital tools, and provides higher-order feedback that supports metalinguistic reflection. Furthermore, while the studies reviewed demonstrate promising results, most were conducted in controlled or limited educational contexts. Future empirical research should expand upon this foundation by investigating long-term impacts, cross-linguistic differences in interference patterns, and the scalability of GBL-AI models across diverse learner populations and educational settings. The discussion reinforces that game-based and AI-driven approaches represent a significant advancement in grammar pedagogy, especially in their potential to neutralize entrenched grammatical interference through personalized, engaging, and adaptive instruction. Nonetheless, their success hinges upon thoughtful integration, ongoing teacher support, and continued research to refine their application in diverse linguistic and cultural contexts.

CONCLUSION

This study concludes that the integration of game-based learning (GBL) methodologies and AI-enhanced platforms presents a transformative approach to mitigating grammatical interference in English language instruction. Unlike traditional, rule-focused pedagogy, which often fails to dismantle entrenched L1 transfer patterns, GBL and AI-driven tools offer interactive, adaptive, and emotionally engaging learning experiences that enable learners to internalize complex grammatical structures more effectively. The reviewed literature highlights how these technologies foster a more learner-centered environment, characterized by personalized feedback, context-rich input, and low-anxiety conditions conducive to risk-taking and language experimentation. GBL methods, particularly when supported by real-time AI feedback systems, can significantly reduce persistent error types, such as article misuse, by promoting deeper grammatical awareness and autonomy. This synergy between cognitive engagement and affective motivation is critical to overcoming the fossilization of L1-influenced errors. Nevertheless, the successful deployment of these innovative methods depends on intentional pedagogical integration. Instructors must align technological tools with clearly defined grammatical objectives and adopt a facilitative role that complements the affordances of AI systems. As the digital landscape of language learning continues to evolve, it is imperative that educators



receive appropriate training in digital pedagogy to ensure the pedagogical coherence and ethical implementation of such technologies. Looking forward, future research should prioritize longitudinal investigations that examine the sustained effects of GBL and AI across diverse linguistic backgrounds, educational contexts, and proficiency levels. Additionally, interdisciplinary collaboration between language educators, instructional designers, and AI developers will be essential to refining these tools and ensuring their relevance, accessibility, and effectiveness in global ELT (English Language Teaching) contexts. In sum, game-based and AI-supported instruction constitutes a promising and necessary evolution in grammar teaching—one that not only addresses the limitations of traditional methods but also aligns with the needs and learning preferences of 21st-century language learners.

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