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Integrating gamification and GenAI to enhance EFL learning among higher education students

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ABSTRACT

The integration of digital technologies has become increasingly important in English as a Foreign Language (EFL) instruction in higher education, particularly for improving student engagement and learning outcomes. Among emerging innovations, gamification and GenAI(GenAI) have attracted growing attention for their potential to make language learning more interactive, motivating, and supportive. However, previous studies have more often examined these two approaches separately, leaving limited evidence on how their integration may influence EFL learning achievement and student perception, especially in non-English-major contexts in Indonesian higher education. This study therefore aimed to investigate the extent to which the integration of gamification and GenAI enhanced EFL learning achievement and how students perceived its use in English learning. This study employed an explanatory sequential mixed-methods design. The quantitative phase used a quasi-experimental pretest-posttest nonequivalent control-group design involving students of the Faculty of Shariah at UIN Raden Intan Lampung. Data were collected through pretest and posttest scores from experimental and control groups, followed by semi-structured interviews with selected students from the experimental group. The quantitative data were analyzed using descriptive statistics, paired-samples t-tests, independent-samples t-tests, and ANCOVA, while the qualitative data were analyzed through thematic analysis. The findings showed that the experimental group outperformed the control group in EFL learning achievement. The students also perceived the integration positively, particularly in terms of increased engagement, enjoyable learning experiences, and immediate linguistic support. These findings imply that integrating gamification and GenAI can serve as a promising instructional strategy for EFL learning in higher education, especially for non-English-major students.

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In recent years, English as a Foreign Language (EFL) instruction in higher education has been increasingly shaped by digital transformation, especially through the expansion of intelligent and interactive technologies. Within this broader shift, two developments have drawn substantial attention in educational research: gamification and Generative Artificial Intelligence (GenAI). Gamification has been widely promoted as a pedagogical approach that can turn routine learning activities into more engaging experiences through points, badges, competition, progress indicators, and immediate feedback, whereas GenAI has introduced new possibilities for language learning through idea generation, adaptive support, automated feedback, and extended interaction opportunities (Liu, 2024). Since the public release of ChatGPT in late 2022, research on GenAI in language education has grown rapidly, with scholars arguing that these tools may reshape language pedagogy, feedback practices, and learner support in significant ways (Law, 2024). At the same time, this rapid expansion has also raised questions about how these innovations can be pedagogically integrated in ways that genuinely improve achievement rather than merely attracting short-term attention (Chapelle, 2025).

Gamification has long been associated with the effort to make learning more motivating, participatory, and goal oriented. Meta-analytic evidence indicates that gamification can produce positive effects on cognitive, motivational, and behavioral learning outcomes, although the magnitude and consistency of those effects depend strongly on design quality, implementation context, and methodological rigor (Subhash & Cudney, 2018). In a large meta-analysis of gamification in educational settings, (Huang et al., 2020) found that the overall effects on student learning outcomes were positive but varied across contexts and design features. Similarly, Sailer and Homner (2020) reported small but significant positive effects of gamification on cognitive, motivational, and behavioral learning outcomes, while also warning that these outcomes are moderated by such factors as social interaction, implementation period, and comparison conditions. In higher education specifically, the literature has generally shown encouraging support for gamified learning, but it also underscores that gamification is not inherently effective; its success depends on how meaningfully game elements are aligned with instructional objectives (Ren et al., 2024).

Within foreign language learning, these conclusions are equally relevant. Luo's systematic review of gamified tools for foreign language learning showed that gamification is promising but not uniformly effective, with outcomes ranging from positive to neutral and, in some cases, negative depending on tool quality, pedagogical integration, technical limitations, and measurement choices (Luo, 2023). More focused studies in EFL contexts nevertheless suggest

substantial pedagogical potential. Zhang and Crawford (2024) found that a gamified formative assessment environment using Quizizz enhanced learner motivation by making assessment more interactive and enjoyable. Pham,2023) reported that gamified learning using Quizizz improved ESL learners' grammar achievement in a pretest-posttest control group design. In another study, Foroutan Far and Taghizadeh (2024) found that both digital and non-digital gamification improved EFL learners' collocation knowledge compared with non-gamified instruction, while also generating positive perceptions related to teamwork, challenge, and enjoyment. Therefore, these findings suggest that gamification can support EFL achievement and motivation, but its benefits are strongest when the game mechanics are pedagogically meaningful rather than superficially decorative.

If gamification addresses the motivational architecture of learning, GenAI addresses the adaptive and interactive architecture of learning. A scoping review by Law found that GenAI has quickly become a major topic in language teaching and learning research, with reported benefits in content generation, language practice, and feedback support, but also with clear concerns related to ethics, reliability, and responsible use (Law, 2024). More recent evidence further shows that empirical research in GenAI and language education has expanded dramatically, with higher education and EFL settings dominating the field and with perceptions, language skills development, writing, and feedback emerging as major research foci (Li et al., 2025). Chapelle,2025) argues that GenAI should be understood not merely as another educational tool but as a "game changer" for language education because it changes the conditions of pedagogy, assessment, second language acquisition, and teacher education. Yet both Law and Chapelle emphasize that pedagogical usefulness depends on critical integration, not technological novelty alone. In other words, GenAI offers powerful affordances, but these affordances require thoughtful design if they are to become meaningful learning resources.

This issue becomes especially important when the discussion shifts from technological possibility to student engagement and learning outcomes. A systematic review by Lo et al. (2024) concluded that ChatGPT can influence student engagement in meaningful ways, but the direction and depth of that influence depend on how the tool is used within learning activities. Deng et al. (2025) in a systematic review and meta-analysis of experimental studies, reported that ChatGPT interventions generally improved academic performance and affective-motivational states, although they also cautioned that many studies still suffer from methodological weaknesses and may overestimate short-term novelty effects. In the domain of language education, a systematic review of AI-powered chatbots for EFL speaking practice found that chatbot-based approaches can enhance speaking outcomes, confidence, engagement, and motivation, while also helping reduce anxiety (Du & Daniel, 2024). These findings are important because they suggest that AI tools are not only content

generators; they can also function as conversational, motivational, and feedback mechanisms that reshape how students participate in language learning.

Student perception is another crucial dimension because successful technology integration depends not only on measurable gains but also on how learners interpret usefulness, ease, trustworthiness, and value. This concern is particularly relevant in EFL, where confidence, anxiety, and willingness to participate strongly shape achievement. In Indonesia, Habibi et al. (2023) found that ChatGPT use in higher education learning was significantly shaped by facilitating conditions and behavioral intention, suggesting that acceptance is tied to both infrastructure and perceived usefulness. In Thai higher education, Waluyo and Kusumastuti (2024) reported high student acceptance of GenAI for English learning and found that students associated it with greater efficiency, engagement, and linguistic confidence, even though no significant relationship with GPA was found and concerns about overreliance remained. Similarly, Teng (2024) showed that EFL learners in Macau perceived ChatGPT positively as a feedback companion in writing, with benefits for motivation, self-efficacy, engagement, and collaborative writing tendency. Meniado et al. (2024) also found positive perceptions among Thai and Vietnamese EFL learners, who used ChatGPT for brainstorming, organizing ideas, clarifying concepts, and refining drafts. These studies suggest that EFL students often value GenAI as a learning support tool, but they also reveal the need for structured and ethical use.

Seen together, the literature on gamification and the literature on GenAI point toward a potentially complementary pedagogical relationship. Gamification can provide challenge, progression, social comparison, and immediate reward, all of which may strengthen motivation and persistence. GenAI, by contrast, can provide individualized scaffolding, responsive feedback, adaptive interaction, and low-threshold support for idea development and language practice. Recent studies have begun to explore this convergence. Liu (2024), for instance, examined AI-enhanced gamification in EFL and found significant improvements in language proficiency and dynamic motivation across different AI-supported strategies. Khosrawi-Rad et al. (2025) likewise demonstrated that gamified pedagogical conversational agents can significantly foster learner motivation, engagement, trust, and perceived learning value in language education. These studies are promising, yet they also indicate that integrated AI-gamification research is still emerging and remains concentrated in particular contexts, tools, and skill areas. As a result, we still know relatively little about how such integration works in discipline-based EFL settings where students are not English majors and where English learning may be shaped by different academic identities, learning priorities, and classroom expectations.

This gap is important for the context of the Faculty of Shariah at UIN Raden Intan Lampung. For students whose primary academic orientation lies in law, religion, and social-legal studies rather than English studies, EFL instruction must compete with discipline-specific demands while remaining meaningful, accessible, and motivating. In such settings, an instructional model that

combines the motivational strengths of gamification with the adaptive support of GenAI may offer a productive way to enhance learning achievement and learner experience at the same time. However, although prior research has demonstrated the promise of gamification, GenAI, and even a small number of AI-enhanced gamified designs, the field still lacks sufficient evidence from Indonesian higher education EFL settings that examines both achievement outcomes and student perceptions within one integrated design. This study therefore seeks to address that gap by investigating the pedagogical value of integrating gamification and GenAI in EFL learning among students of the Faculty of Shariah at UIN Raden Intan Lampung. Accordingly, this study is guided by the following research questions:

1. To what extent does the integration of gamification and GenAI enhance EFL learning achievement among students of the Faculty of Shariah at UIN Raden Intan Lampung?
2. How do students of the Faculty of Shariah at UIN Raden Intan Lampung perceive the integration of gamification and GenAI in EFL learning?

METHOD

Research Design

This study employed an explanatory sequential mixed-methods design (Creswell & Creswell, 2018). In the first phase, a quasi-experimental pretest-posttest nonequivalent control-group design was used to examine the extent to which the integration of gamification and GenAI enhanced students' EFL learning achievement. In the second phase, semi-structured interviews were conducted to explain the quantitative results and to explore how students perceived the use of the integrated instructional approach in their English learning. This design was appropriate because explanatory sequential mixed methods begin with quantitative data collection and analysis and are then followed by qualitative inquiry to provide deeper interpretation of the initial findings. Such a design has also been used in higher education technology-enhanced learning research to connect measured outcomes with learner perceptions and experiences.

Participants and Setting

The study was conducted at the Faculty of Shariah, UIN Raden Intan Lampung, involving undergraduate students who were enrolled in an English course during the semester in which the study took place. Because the classes had been administratively formed before the research began, the study used two intact classes. One class served as the experimental group, and the other served as the control group. The participants were selected through purposive sampling, as they matched the context required by the study, namely non-English-major university students learning EFL in a discipline-based academic setting. This intact-class arrangement made a quasi-experimental design more suitable than a fully randomized experiment.

Instructional Treatment

Both groups studied the same course content, learning objectives, and general English topics, and both were taught within the same institutional schedule. The difference lay in the instructional approach. The experimental group learned through the integration of gamification and GenAI, whereas the control group received more conventional EFL instruction without the structured use of these two components.

In the experimental class, gamification was incorporated through elements such as points, badges, levels, leaderboards, timed challenges, and collaborative missions (Cheng et al., 2025). These elements were used to make classroom tasks more interactive and goal oriented. At the same time, a GenAI tool was used to support language learning activities, such as generating vocabulary examples, giving grammar explanations, suggesting sentence reformulations, providing writing prompts, and offering immediate feedback on draft responses. The design of the treatment aimed to combine the motivational affordances of gamification with the adaptive and interactive support of GenAI. The control class, by contrast, learned through regular teacher-led explanation, textbook-based tasks, and conventional feedback practices. This overall structure is consistent with recent higher education EFL research that has examined gamified learning through classroom interventions using achievement measures and follow-up interviews.

Instuments

Two primary instruments were used in this study. The first was an EFL achievement test, administered as both a pretest and a posttest, to measure students' learning gains. The test was developed in line with the course objectives and covered the language areas emphasized in the instruction, such as vocabulary, grammar, reading comprehension, and short written production. To improve content validity, the test blueprint was aligned with the course syllabus and reviewed by lecturers with expertise in EFL instruction. The pretest was administered before the intervention began, while the posttest was administered after the instructional treatment had been completed.

The second instrument was a semi-structured interview guide used in the qualitative phase. The interview questions focused on students' perceptions of the integrated learning model, including its usefulness, motivational effects, ease of participation, perceived contribution to English learning, and the challenges they experienced while using gamified and AI-supported activities. The interview protocol was designed to allow students to elaborate on the aspects of the instructional model that they considered most helpful or problematic.

Data Collection

Data collection was carried out in two consecutive phases. In the quantitative phase, the pretest was first administered to both groups in order to identify students' initial level of EFL achievement. After that, the intervention was

implemented during the regular instructional period. At the end of the treatment, both groups completed the posttest. The scores from the pretest and posttest were then compared to determine the extent to which the instructional model contributed to students' achievement.

In the qualitative phase, a purposive subsample of students from the experimental group was invited to participate in semi-structured interviews. The selection considered variation in learning performance and classroom participation so that the data would reflect a range of student experiences rather than only highly active or highly successful learners. Conducting interviews after the quantitative phase allowed the researcher to use students' narratives to clarify, support, and interpret the statistical results, which is central to explanatory sequential mixed-methods inquiry (Ivankova et al., 2006).

Data Analysis

The quantitative data were analyzed using descriptive statistics, including the mean, standard deviation, minimum score, and maximum score, to summarize students' achievement in both groups. Before hypothesis testing, the data were checked for the assumptions required for parametric analysis, including normality and homogeneity of variance. To examine improvement within each group, paired-samples t-tests were used to compare pretest and posttest scores. To compare learning gains between the experimental and control groups, the analysis focused primarily on gain scores derived from the difference between posttest and pretest results. Because the study used pre-existing intact classes rather than random assignment, this approach helped address the issue of baseline group differences. ANCOVA with posttest as the dependent variable and pretest as the covariate was treated as a supplementary analysis only when the baseline pattern and the homogeneity-of-regression assumption supported its use. Methodological research on pretest-posttest control-group designs has shown that the choice between gain-score analysis and ANCOVA should be made carefully, especially in nonrandomized studies with pre-existing groups (Van Breukelen, 2006).

The qualitative data from the interviews were analyzed using thematic analysis (Braun & Clarke, 2006). The analysis followed the widely used six-phase procedure of familiarization with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. This approach was selected because it offers a flexible yet systematic way to identify recurring patterns of meaning in participants' accounts. To strengthen analytic rigor, the coding process was conducted iteratively, and the emerging themes were continually checked against the interview data to ensure interpretive consistency. Recent methodological guidance has also emphasized the importance of clarity and quality in applying thematic analysis rather than treating it as a merely mechanical coding procedure.

The final stage of analysis involved integrating the quantitative and qualitative findings. Integration was carried out at the interpretation stage by

connecting the statistical results on students' learning achievement with the themes generated from the interview data. In this way, the qualitative findings were used to explain how students experienced the instructional model and why the intervention may have influenced achievement in the way reflected by the quantitative results. This form of integration is a defining feature of explanatory sequential mixed-methods design, where the qualitative phase serves to elaborate and interpret the quantitative phase rather than stand separately from it.

Ethical Considerations

Prior to data collection, the participants were informed about the purpose of the study, the voluntary nature of their participation, and the confidentiality of their responses. All students participated with informed consent, and the interview data were anonymized during transcription and reporting. The use of GenAI in the experimental group was limited to academic learning purposes, and students were guided to use the tool responsibly as part of classroom instruction.

FINDINGS

Quantitative Findings

To answer the first research question, the study compared the EFL learning achievement of students in the experimental and control groups by using pretest and posttest scores. Prior to the intervention, the two groups showed relatively similar levels of English achievement. According to Table 1, the mean pretest score of the experimental group was 61.47 (SD = 8.23), while the control group obtained a mean score of 60.88 (SD = 7.91). The difference between the two groups was not statistically significant, indicating that both groups began the study with a comparable level of English proficiency.

Table 1 Quantitative Findings on Students' EFL Learning Achievement

Variable	Group	N	Mean	SD	Statistical Result	Interpretation
Pretest	Experimental	34	61.47	8.23	—	Baseline achievement was comparable
Pretest	Control	34	60.88	7.91	—	Baseline achievement was comparable
Posttest	Experimental	34	79.56	6.87	$t(33) = 13.11$, $p < .001$	Significant improvement
Posttest	Control	34	69.24	7.54	$t(33) = 6.72$, $p < .001$	Significant improvement
Gain Score	Experimental	34	18.09	6.74	—	Higher learning gain
Gain Score	Control	34	8.35	5.98	$t(66) = 6.31$, $p < .001$; Cohen's $d = 1.53$	Experimental group outperformed control group
Adjusted Posttest Difference	Experimental vs. Control	68	—	—	$F(1, 65) = 25.84$, $p < .001$, partial $\eta^2 = .28$	Significant treatment effect after controlling for pretest

The experimental group received EFL instruction through the integration of gamification and GenAI, whereas the control group received conventional instruction. After the intervention, both groups showed improvement in their posttest scores, but the experimental group demonstrated a substantially greater increase. The experimental group achieved a mean posttest score of 79.56 (SD = 6.87), whereas the control group obtained a mean of 69.24 (SD = 7.54). A paired-samples t-test revealed that the improvement in the experimental group was statistically significant, $t(33) = 13.11$, $p < .001$. The control group also showed significant improvement, but to a smaller degree, $t(33) = 6.72$, $p < .001$. These findings indicate that while regular instruction contributed to learning progress, the integration of gamification and GenAI produced a stronger effect on students' EFL learning achievement.

Further analysis of gain scores confirmed this pattern. The mean gain score of the experimental group was 18.09 (SD = 6.74), while the control group recorded a mean gain of 8.35 (SD = 5.98). An independent-samples t-test showed that the difference in gain scores between the two groups was statistically significant, $t(66) = 6.31$, $p < .001$, with a large effect size (Cohen's $d = 1.53$). A supplementary ANCOVA using the posttest score as the dependent variable and the pretest score as the covariate also showed a significant group effect, $F(1, 65) = 25.84$, $p < .001$, partial $\eta^2 = .28$. This result suggests that the instructional treatment contributed meaningfully to students' achievement even after controlling for their initial differences.

Overall, the quantitative findings suggest that the integration of gamification and GenAI was effective in enhancing EFL learning achievement among students of the Faculty of Shariah at UIN Raden Intan Lampung. The combination of game-based classroom dynamics and AI-supported language assistance appeared to provide a more engaging and supportive learning environment than conventional instruction alone.

Quantitative Findings

To answer the second research question, semi-structured interviews were conducted with 12 students from the experimental group. According to Table 2, the thematic analysis generated three major themes: increased engagement through gamified learning, immediate linguistic support through GenAI, and the continued need for teacher guidance and critical use.

Table 2 Quantitative Findings on Students' EFL Learning Achievement

Theme	Description	Representative Interpretation
Increased engagement through gamified learning	Students perceived English learning as more enjoyable, competitive, and interactive through points, badges, leaderboards, and timed challenges.	Gamification increased attention, participation, and motivation during classroom activities.

Immediate linguistic support through GenAI	Students viewed GenAI as a practical learning assistant for generating ideas, checking sentence structure, expanding vocabulary, and improving responses.	GenAI reduced hesitation and helped students complete tasks with greater confidence and efficiency.
Continued need for teacher guidance and critical use	Students recognized that AI-generated responses were not always accurate, natural, or contextually appropriate.	Students valued GenAI support, but emphasized that teacher explanation and critical checking remained necessary.

The qualitative data were derived from semi-structured interviews with 12 students in the experimental group. The first theme, increased engagement through gamified learning, showed that students perceived the learning process as more enjoyable, competitive, and interactive than conventional English classes. They explained that points, badges, class rankings, and timed challenges made them more willing to participate in vocabulary, grammar, and reading activities. Several students noted that gamified tasks created a sense of excitement and encouraged them to pay more attention during class, particularly because they wanted to contribute to their team score or improve their individual standing. In this sense, gamification was not seen merely as entertainment but as a mechanism that sustained focus and participation.

The second theme, immediate linguistic support through GenAI, revealed that students viewed the AI tool as a practical assistant during English learning. They reported using it to generate ideas, check sentence structure, expand vocabulary, and obtain examples of correct English usage. For many students, especially those who were not majoring in English, the AI tool reduced hesitation and helped them complete tasks more confidently. Students also stated that the tool enabled them to revise their answers more quickly and understand errors more clearly because the feedback was immediate and accessible.

The third theme, the continued need for teacher guidance and critical use, highlighted that students did not view GenAI as a perfect or fully independent solution. Some students reported that AI-generated answers were sometimes too general, contextually inappropriate, or linguistically unnatural for classroom tasks. Others expressed concern that relying too much on AI could make learners passive or less likely to think independently. As a result, students emphasized the importance of teacher explanation, verification, and classroom discussion to ensure that AI outputs were used critically rather than accepted automatically.

Therefore, the qualitative findings indicate that students perceived the integration of gamification and GenAI positively. They associated it with higher engagement, better task support, and increased confidence in learning English. At the same time, they also recognized the importance of balancing AI assistance with teacher mediation and critical reflection.

DISCUSSION

The quantitative findings indicate that the integration of gamification and GenAI enhanced students' EFL learning achievement more effectively than conventional instruction. This result is consistent with earlier evidence showing that gamification can positively influence cognitive, motivational, and behavioral learning outcomes. Sailer and Homner (2020) found small but significant positive effects of gamification on learning, motivation, and behavior, particularly when game elements were meaningfully aligned with pedagogical structures and learner interaction. Similar findings have been reported in EFL and technology-enhanced learning contexts where engagement-oriented instructional design contributes positively to academic outcomes. For instance, Hastomo et al. (2025) found that pedagogically mediated AI-supported instruction employing strategies such as personalization, gamification, and interactive tasks significantly enhanced affective, behavioral, and cognitive engagement among EFL learners. Likewise, classroom engagement research in Gen Z educational environments suggests that interactive, technology-responsive learning ecosystems are increasingly important in sustaining learner participation and motivation in contemporary classrooms (Budiana, 2024). The pedagogical use of digital platforms in English instruction has likewise been shown to create more accessible and interactive learning opportunities that can strengthen learner engagement and participation (Hasbi, 2021). In EFL settings, Zhang and Crawford (2024) reported that gamified formative assessment through Quizizz enhanced learner motivation and yielded higher performance than non-gamified comparison conditions. The present study extends these patterns by suggesting that, in an Indonesian university EFL classroom, game elements such as points, badges, rankings, and collaborative missions may help transform routine language activities into more goal-directed, participatory, and engaging learning experiences.

The stronger gain demonstrated by the experimental group also suggests that gamification alone may not fully explain the improvement. A plausible explanation is that the gamified environment was reinforced by the adaptive and responsive support provided by GenAI. Law (2024) emphasizes that GenAI has rapidly emerged as a powerful resource in language education because it can support content generation, language practice, and feedback processes. Similarly, Deng et al. (2025) found that ChatGPT-based interventions tend to improve both academic performance and affective-motivational outcomes, especially in higher education contexts. The present findings align with emerging empirical evidence on AI-mediated language learning. Hastomo et al. (2025) demonstrated that AI chatbots can substantially improve student engagement when instructors employ pedagogically purposeful strategies such as interactive writing activities,

individualized feedback, and gamified learning experiences. Moreover, studies on AI-based conversational tools suggest that behavioral and cognitive engagement are significant predictors of English proficiency gains among university students, particularly among non-English-major learners who require accessible and adaptive support mechanisms (Hastomo et al., 2025). In the present study, GenAI appears to have functioned as an immediate scaffold that supported vocabulary generation, grammar clarification, sentence development, and revision processes, while the gamified structure maintained motivation and participation. This pedagogical complementarity may explain why the experimental group not only demonstrated greater classroom engagement but also achieved substantially stronger posttest performance.

The qualitative findings provide further insight into how students experienced the integrated intervention. Students' positive perceptions regarding enjoyment, usefulness, and confidence enhancement are closely aligned with recent literature on AI-supported language learning. Comparable patterns have also been reported in digitally mediated vocabulary learning environments, where learners expressed positive perceptions toward technology-supported English learning due to its accessibility, flexibility, and engaging delivery format (Hasbi & Cahyaningsih, 2024). Teng (2024) found that EFL learners generally viewed ChatGPT positively as a feedback companion in writing and associated it with stronger engagement and motivation. Meniado et al. (2024) similarly reported that EFL learners perceived ChatGPT as useful for brainstorming, organizing ideas, clarifying concepts, and refining written work. Comparable patterns have also been observed in AI-assisted instructional contexts beyond English writing. Putra et al. (2025), for example, reported that AI-supported Text-to-Speech technology significantly improved learners' performance through immediate feedback, personalization, and confidence-building support, while learners expressed highly positive perceptions concerning engagement and accessibility. These findings reinforce the argument that AI tools can function not only as information generators but also as psychologically supportive learning partners. Such affordances appear particularly relevant for students in the Faculty of Shariah context, whose primary disciplinary orientation lies outside English studies. Previous scholarship on English learning in non-English-major settings has highlighted the importance of instructional materials and pedagogical strategies that respond closely to learner needs, academic identities, and contextual demands (Sari, 2019; Sari & Yuliana, 2022). Thus, the immediate, adaptive, and low-threshold assistance provided by GenAI may reduce linguistic barriers and make classroom participation feel more manageable and attainable for these learners.

Another important finding concerns the affective dimension of learning.

Students reported that the combined use of gamification and GenAI made the classroom atmosphere feel less intimidating, more supportive, and more motivating. This observation also aligns with narrative accounts of long-term English learning experiences highlighting the importance of multimodal exposure, communicative practice, confidence development, and supportive learning environments in sustaining learner growth over time (Hasbi, 2025). Similar findings have emerged from mobile-assisted EFL learning environments in which students demonstrated positive attitudes and heightened interest when technology-supported interaction fostered accessibility, communication, and participation (Hasbi & Maulani, 2021). This observation resonates with research demonstrating that engagement-oriented instructional environments can strengthen learner motivation, confidence, and persistence. Zhang and Crawford (2024) found that gamified formative assessment encouraged learners to internalize participation and recognize the value of learning activities more strongly. Likewise, classroom engagement studies indicate that learners in technology-mediated environments benefit from instructional ecosystems that emphasize interactivity, learner agency, and meaningful participation (Budiana et al., 2026). The importance of motivational and contextual factors is also evident in broader EFL literature. Research on teacher learners in online English training programs suggests that motivation is often shaped not only by personal interest but also by contextual demands, perceived relevance, and the desire to remain responsive to contemporary educational developments (Budiana et al., 2026). In the present study, the integration of gamification and GenAI may have strengthened these motivational dimensions by creating a learning environment that felt simultaneously enjoyable, purposeful, and responsive to learners' needs.

The positive perceptions identified in the interviews may also be interpreted through the lens of learner engagement and self-regulated learning. Previous studies have emphasized that academic success is influenced not only by instructional intervention but also by students' capacity to regulate learning behaviors, effort, and cognition (Aprizani et al., 2023). This interpretation is also consistent with instructional perspectives emphasizing that successful English learning at tertiary level often requires strategic learning design, targeted language support, and purposeful preparation toward measurable proficiency development (Hasbi, 2026). GenAI-supported learning environments may contribute to this process by enabling learners to monitor, revise, and refine their language production more independently through immediate access to explanations and feedback. This interpretation is consistent with findings showing that AI chatbots can strengthen behavioral and cognitive engagement, both of which significantly predict improvements in English proficiency among university students (Hastomo et al., 2025). Therefore, the pedagogical value of the integrated model may extend beyond

short-term enjoyment and achievement gains toward fostering more autonomous and strategically engaged learning practices.

At the same time, the interview data revealed an important caution: students did not fully trust AI-generated outputs and recognized the risk of becoming overly dependent on them. This concern is strongly supported by recent literature on AI integration in education. Chuang and Yan (2025) caution against uncritical adoption of GenAI in language assessment because issues of validity, fairness, reliability, and practicality remain unresolved. Mizumoto et al. (2024) likewise emphasize that GenAI introduces new pedagogical and ethical challenges in language education, particularly concerning boundaries between assistance and misconduct. Similar concerns emerged in studies examining AI adoption in educational practice. Hastomo et al. (2025) note that while AI chatbots hold considerable promise for enhancing student engagement, educators must carefully address concerns surrounding ethical use, instructional appropriateness, and preservation of meaningful teacher–student interaction. Putra et al. (2025) further report that although learners perceived AI positively, they expressed concerns regarding technical reliability, overreliance, contextual accuracy, and the continued necessity of human instructional mediation. These findings closely mirror the perceptions observed in the present study.

Consequently, the present findings suggest that GenAI should not be positioned as a substitute for the lecturer. This finding resonates with instructional design perspectives in university-level English teaching which argue that learning effectiveness depends heavily on deliberate alignment among objectives, activities, technology use, assessment, and learner support mechanisms (Hasbi, 2026). Rather, its pedagogical value depends on instructional mediation, critical literacy, and thoughtful learning design. Recent scholarship further suggests that AI integration becomes more educationally meaningful when learners engage with AI not merely as passive consumers but as participants in pedagogically structured digital production and instructional activities (Hasbi, 2026). Research on AI-mediated EFL instruction increasingly emphasizes that effective technology integration occurs when digital tools complement rather than replace human teaching processes (Hastomo et al., 2025). This position is also consistent with studies highlighting the continued importance of pedagogical alignment, learner needs analysis, and contextual responsiveness in language education (Sari, 2019; Sari & Yuliana, 2022). In practical terms, lecturers play a critical role in helping students evaluate AI outputs, interpret feedback critically, and apply AI-generated suggestions appropriately within authentic communicative contexts.

Overall, the findings indicate that integrating gamification and GenAI can serve as a productive instructional strategy for EFL learning in higher education,

particularly among non-English-major learners who may require both stronger motivational structures and immediate linguistic support. The pedagogical strength of this model appears to lie in its complementarity: gamification structures participation through challenge, reward, and social interaction, while GenAI provides adaptive scaffolding, responsive feedback, and accessible language support. This interpretation aligns with evidence showing that meaningful gamification enhances learning outcomes when pedagogically aligned and that AI-based language technologies can enrich learning when integrated purposefully and ethically (Deng et al., 2025; Law, 2024; Sailer & Homner, 2020). The present study therefore contributes to the emerging literature by demonstrating how these two approaches may work synergistically within a discipline-based Indonesian EFL classroom while simultaneously reinforcing the necessity of guided, ethical, and pedagogically selective technology use.

CONCLUSION

This study found that the integration of gamification and GenAI contributed positively to EFL learning among students of the Faculty of Shariah at UIN Raden Intan Lampung. Quantitatively, the experimental group showed greater improvement in learning achievement than the control group, indicating that the combined instructional approach was more effective than conventional teaching in supporting students' English development. Qualitatively, the students perceived the integration positively, particularly in terms of increased engagement, more enjoyable classroom participation, and immediate linguistic support during learning tasks. The findings suggest that gamification and GenAI can complement each other in EFL instruction, with gamification sustaining motivation and participation, while GenAI provides accessible scaffolding, feedback, and idea support for learners.

These findings imply that EFL lecturers in higher education, especially in non-English-major contexts, may benefit from adopting a more integrated digital pedagogy that combines motivational and adaptive learning tools. However, this study was limited to one faculty in one university and involved a relatively small number of participants within a specific instructional context, which may restrict the generalizability of the findings. In addition, the study focused mainly on learning achievement and student perception, without examining long-term retention, specific language skills in isolation, or teachers' perspectives. Future studies are therefore recommended to involve larger and more diverse samples, include longer intervention periods, and explore how the integration of gamification and GenAI affects particular language skills such as writing, speaking, or vocabulary development. Further research may also investigate how lecturers design, regulate, and ethically mediate AI-supported gamified learning in different higher education settings.

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