

Assessing the Effectiveness of a Game-Based Educational Package for the Tenth-Grade English Language Course on Students' Higher-Order Cognitive Levels

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ABSTRACT

The present study was conducted to assess the effectiveness of a game-based educational package for the tenth-grade English language course on students' higher-order cognitive levels. A quasi-experimental method with a pretest-posttest design and a control group was employed. The statistical population consisted of all tenth-grade students in Rafsanjan during the 2024–2025 academic year. For the screening phase, a sample of 384 students who experienced difficulties in learning English (i.e., obtained scores below 14 in each of the higher-order cognitive levels—analysis, evaluation, and creation—on a researcher-developed English language test) and were willing to cooperate with the researcher was selected. The students were then randomly assigned to two groups of 20 participants each. Subsequently, one group was designated as the experimental group and received English language instruction based on the developed game-based educational package for eight weeks, three sessions per week (from January 4 to March 5, 2025). During the same period, members of the control group received traditional English language instruction and did not participate in any supplementary educational programs or extracurricular instructional activities. Upon completion of the intervention, the English language test was administered to both groups. Data were analyzed using Multivariate Analysis of Covariance (MANCOVA) in SPSS version 25. The findings indicated that the game-based English language educational package had a simultaneous effect on the linear combination of analysis, evaluation, and creation in the tenth-grade English language course. The effect size of the game-based educational package on the combined linear construct of analysis, evaluation, and creation among students was 0.819. Furthermore, the effect sizes for analysis, evaluation, and creation were 0.448, 0.643, and 0.658, respectively.

Keywords: Educational package, gamification, English language course, tenth grade.

1. Introduction

The rapid transformation of educational systems in the twenty-first century has shifted the primary objective of schooling from the simple transmission of knowledge to the development of higher-order cognitive skills. Contemporary educational paradigms emphasize learners' ability to analyze information, evaluate evidence, solve complex problems, and generate innovative ideas rather than merely memorize factual content. These competencies are increasingly recognized as essential for academic success, lifelong learning, and effective participation in knowledge-based societies. Within this context, language education occupies a unique position because language learning not only facilitates communication but also serves as a medium through which critical thinking, reasoning, and creativity can be cultivated. Consequently, English language teaching has increasingly moved beyond the mastery of vocabulary and grammar toward the promotion of higher-order cognitive processes among learners (Taherkhani & Gholizadeh, 2024; Tuxtayevich et al., 2024).

Higher-order cognitive skills are commonly conceptualized through the revised Bloom's Taxonomy, which places analysis, evaluation, and creation at the highest levels of cognitive functioning. Analysis involves the ability to break information into meaningful components and identify relationships among them. Evaluation requires learners to judge information, arguments, or solutions based on specific criteria. Creation, the highest cognitive level, involves generating original ideas, products, or solutions through the synthesis of acquired knowledge and experiences. Educational researchers have increasingly argued that effective English language instruction should intentionally target these advanced cognitive processes because language learning provides numerous opportunities for interpretation, critique, argumentation, and creative expression (Dallashah, 2024; Ulum, 2021). Nevertheless, evidence suggests that many English language classrooms continue to focus primarily on lower-order cognitive outcomes such as memorization, repetition, and procedural language use, thereby limiting students' opportunities to develop sophisticated thinking skills (Hasnah et al., 2023; Ng & Jeyaraj, 2023).

The growing emphasis on critical thinking in language education has led researchers to investigate the relationship between cognitive development and language proficiency. A meta-synthesis conducted by Taherkhani and Gholizadeh demonstrated that critical thinking significantly contributes

to improvements across multiple language skills, including reading, writing, speaking, and listening (Taherkhani & Gholizadeh, 2024). Similarly, Tuxtayevich and colleagues highlighted that digital educational environments can effectively support the development of critical thinking when instructional activities are deliberately designed to engage learners in analytical and evaluative processes (Tuxtayevich et al., 2024). These findings suggest that language learning and higher-order thinking are mutually reinforcing processes, making English classrooms an appropriate context for fostering advanced cognitive abilities.

Despite these theoretical advances, classroom implementation remains challenging. Several textbook evaluation studies have reported insufficient attention to higher-order cognitive skills in English language instructional materials. A systematic review by Soe indicated that although many contemporary English language textbooks claim to promote critical thinking, the actual proportion of activities targeting analysis, evaluation, and creation remains relatively limited (Soe, 2024). Similar findings were reported by Ng and Jeyaraj, who identified a predominance of lower-level cognitive tasks in secondary school English textbooks (Ng & Jeyaraj, 2023). Hasnah and colleagues likewise concluded that locally produced English language textbooks often provide inadequate opportunities for learners to engage in critical and creative thinking activities (Hasnah et al., 2023). These observations underscore the need for innovative instructional approaches capable of compensating for the limitations of traditional educational materials.

One promising approach is gamification, which refers to the integration of game elements and mechanics into non-game educational contexts to enhance learner engagement, motivation, and performance. Gamification typically incorporates elements such as points, badges, levels, challenges, feedback systems, narratives, and rewards to create meaningful and enjoyable learning experiences. Unlike entertainment-oriented games, educational gamification seeks to leverage motivational principles associated with gameplay while maintaining a clear instructional focus. Recent years have witnessed growing interest in the application of gamification within language education due to its potential to transform passive learners into active participants in the learning process (Charunin et al., 2024; Temel & Cesur, 2024).

Research has consistently demonstrated the motivational benefits of gamified learning environments. Temel and

Cesur found that gamification supported by Web 2.0 tools significantly improved learners' motivation and academic achievement in online English learning environments (Temel & Cesur, 2024). Similarly, Ahmed and colleagues reported that game-based learning reduced language anxiety while simultaneously increasing learner motivation among English as a Foreign Language (EFL) students (Ahmed et al., 2022). Inayati and Waloyo also observed positive effects of online gamification platforms on student engagement and learning outcomes in English language instruction (Inayati & Waloyo, 2022). These findings suggest that gamification can create psychologically supportive environments that encourage active participation and sustained engagement with learning tasks.

Beyond motivation, gamification has shown considerable promise in enhancing language-related academic outcomes. Research has documented positive effects on vocabulary acquisition, reading comprehension, speaking skills, and overall language proficiency. Sayed demonstrated that competitive digital games significantly improved vocabulary retention among primary school learners (Sayed, 2022). Similarly, Qiao and colleagues reported that a gamified morphological awareness intervention positively influenced students' cognitive, motivational, and affective outcomes (Qiao et al., 2022). More recently, Li and colleagues found that playful pedagogical activities produced superior vocabulary learning outcomes compared to traditional instructional methods (Li et al., 2025). Additional studies have shown that innovative language learning activities can strengthen reading comprehension and inferential reasoning skills, both of which are closely associated with higher-order cognitive functioning (Shafie et al., 2024; Zakaria et al., 2023).

The effectiveness of gamification may be explained through several theoretical perspectives. Self-determination theory suggests that game elements support learners' needs for autonomy, competence, and relatedness, thereby enhancing intrinsic motivation. Cognitive engagement theories further propose that well-designed game-based activities encourage deeper information processing and active knowledge construction. From a constructivist perspective, gamified learning environments provide authentic contexts in which learners can explore, experiment, collaborate, and reflect, leading to richer cognitive development. Consequently, gamification is increasingly viewed not merely as a motivational tool but also as a pedagogical strategy capable of promoting complex

cognitive processes (Kaur et al., 2025; Shafiei Sarvestani et al., 2025).

Recent evidence supports the notion that gamification can contribute directly to the development of higher-order thinking skills. Shafiei Sarvestani and colleagues reported that gamification significantly enhanced creative thinking and research tendencies among university students in virtual learning environments (Shafiei Sarvestani et al., 2025). Likewise, Kaur and colleagues found that AI-enhanced gamification improved learning outcomes through increased cognitive engagement and deeper interaction with educational content (Kaur et al., 2025). These findings indicate that gamification may provide learners with opportunities to analyze information, evaluate alternatives, and create original responses, all of which correspond to the upper levels of Bloom's Taxonomy.

In English language education, the promotion of higher-order cognitive skills is closely linked to instructional practices that encourage active learning. Duresa emphasized the importance of learner-centered approaches that position students as active participants in constructing knowledge rather than passive recipients of information (Duresa, 2023). Similarly, Rutkienė and colleagues demonstrated that flipped learning environments enhanced student engagement and satisfaction by encouraging greater responsibility for learning (Rutkienė et al., 2022). Brain-based and technology-supported instructional approaches have also been shown to improve language learning outcomes through increased cognitive involvement and meaningful interaction with learning materials (Abdolmaleki & Saeedi, 2024; Muthmainnah et al., 2022).

Another important consideration is the role of instructional content and teaching strategies in stimulating analytical and evaluative thinking. Studies have shown that questioning techniques, graphic organizers, content-based instruction, and oral communication activities can promote deeper cognitive engagement in language learning contexts. Doğan and colleagues highlighted the importance of effective questioning strategies in encouraging reflective and analytical thinking among learners (Doğan et al., 2023). Shahid and colleagues demonstrated that graphic organizers supported vocabulary development through structured cognitive processing (Shahid et al., 2024). Lo and Shi found that content-based English instruction encouraged students to engage more deeply with texts and develop sophisticated interpretive skills (Lo & Shi, 2024). Likewise, Mahdi reported significant improvements in oral communication abilities through learner-centered English language activities

that required active participation and higher-level cognitive processing (Mahdi, 2024).

The relationship between critical thinking and language learning has also been extensively documented. Du and Zhang found that university students perceived critical thinking activities as valuable opportunities for enhancing language proficiency and intellectual development (Du & Zhang, 2022). Işıklı argued that English language instruction should explicitly incorporate critical approaches to support the development of learners' reasoning and evaluative capacities (Işıklı, 2021). Furthermore, Hastuti and colleagues emphasized that instructional planning should intentionally incorporate activities that stimulate reflection, analysis, and problem-solving within language classrooms (Hastuti et al., 2022). These findings collectively support the argument that language instruction should move beyond linguistic competence alone and address broader cognitive development goals.

Teacher preparedness also plays a crucial role in the successful implementation of innovative instructional approaches. Kshetree emphasized the importance of pedagogical content knowledge in enabling teachers to integrate effective teaching strategies into language instruction (Kshetree, 2023). Likewise, Charunin and colleagues reported that teachers generally perceived digital gamification positively but highlighted the need for appropriate training and instructional design support to maximize its effectiveness (Charunin et al., 2024). Therefore, the development of structured and empirically validated game-based educational packages may help teachers implement gamification more systematically and effectively in English language classrooms.

Although previous studies have documented the benefits of gamification for motivation, engagement, vocabulary learning, reading comprehension, and creativity, relatively few investigations have focused specifically on its impact on higher-order cognitive levels among secondary school students learning English as a foreign language. Furthermore, much of the existing research has concentrated on isolated language skills rather than integrated cognitive outcomes corresponding to the analysis, evaluation, and creation levels of Bloom's Taxonomy. This gap is particularly important because educational systems increasingly emphasize the development of critical and creative thinking as essential competencies for future academic and professional success. Accordingly, there is a need for empirical research examining whether structured game-based educational interventions can effectively

enhance higher-order cognitive learning outcomes in secondary-level English language education.

Therefore, the present study was conducted to examine the effectiveness of a game-based educational package for the tenth-grade English language course on students' higher-order cognitive levels, including analysis, evaluation, and creation.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a quasi-experimental research design with a pretest–posttest control group structure. The independent variable was the game-based educational package for the tenth-grade English language course, and the dependent variable was students' learning at higher-order cognitive levels, including analysis, evaluation, and creation. The statistical population consisted of all tenth-grade students in Rafsanjan during the 2024–2025 academic year. Initially, a researcher-developed 30-item English language test was administered to 384 tenth-grade students to identify students who had difficulty learning English at higher-order cognitive levels. From this group, 40 students who scored below 14 out of 20 in each of the three cognitive levels of analysis, evaluation, and creation, and who were willing to participate in the study, were selected. These students were then randomly assigned to an experimental group and a control group, with 20 students in each group. The experimental group received English language instruction through the game-based educational package for eight weeks, three sessions per week, from January 4 to March 5, 2025. During the same period, the control group received traditional English language instruction and did not receive any supplementary instructional program or extracurricular educational support. At the end of the intervention period, both groups were assessed again using the posttest to determine the effectiveness of the game-based educational package on students' higher-order cognitive learning in English.

2.2. Measures

The instrument used to assess the dependent variable was a researcher-developed 30-item English language test specifically designed for the tenth-grade English language course. The test was developed to measure students' learning at higher-order cognitive levels, namely analysis, evaluation, and creation. The structure of the test included 10 items for

each cognitive level. The analysis section assessed students' ability to identify complex grammatical structures, infer logical relationships between sentences, and interpret vocabulary use in different communicative contexts. The evaluation section measured students' ability to make critical judgments about linguistic content, compare the effectiveness of different writing styles, determine the appropriateness of expressions in specific communicative situations, and critique arguments presented in textual dialogues. The creation section assessed students' ability to produce new linguistic outputs, such as writing a short story based on visual prompts, designing dialogues for hypothetical situations, and rewriting texts using advanced grammatical structures. The psychometric properties of the test were examined through item difficulty and discrimination indices. The difficulty coefficients ranged from 0.45 to 0.55 for analysis items, from 0.40 to 0.50 for evaluation items, and from 0.35 to 0.45 for creation items, indicating an appropriate progression of difficulty across the three levels. The discrimination index for most items was above 0.30, and the items related to evaluation and creation generally showed higher discrimination coefficients, mostly between 0.35 and 0.45. These findings indicated that the test had acceptable sensitivity for distinguishing students with different levels of higher-order cognitive performance and was suitable for assessing changes resulting from the educational intervention.

2.3. Intervention

The intervention consisted of a researcher-developed game-based educational package for the tenth-grade English language course. The package was implemented in the experimental group over eight weeks, with three instructional sessions per week. Its overall purpose was to transform English language learning from a primarily teacher-centered and traditional process into an interactive, motivational, and cognitively challenging learning experience. The intervention was designed around five major components: structural game elements, educational content, psychological-motivational features, technical-executive requirements, and evaluation and monitoring procedures. Through this structure, students were encouraged to participate actively in learning tasks, engage with English content at deeper cognitive levels, and improve their ability to analyze, evaluate, and create linguistic outputs.

The first component of the intervention focused on structural game elements. These elements included points, badges, levels, challenges, narrative scenarios, immediate feedback, timing, competition, and visible progress. Students received points for completing learning tasks, participating in classroom activities, solving language challenges, and contributing to group performance. Badges were used as symbolic rewards for skill acquisition, progress, participation, creativity, and completion of learning stages. Activities were organized into different levels of difficulty, and students were able to unlock more advanced stages by gaining points and demonstrating mastery. Individual, group-based, timed, surprise, and optional challenges were used to stimulate engagement and promote healthy competition. Narrative elements, such as storylines, characters, missions, and problem situations, were integrated into the lessons to increase emotional and cognitive involvement. Immediate corrective, encouraging, comparative, and written feedback was provided after activities so that students could identify their errors and improve their learning strategies.

The second component addressed the instructional content of the English language course. English vocabulary, grammar, listening, speaking, reading, writing, pronunciation, and situational language use were presented through game-based activities. Vocabulary learning was supported through word-building games, lexical puzzles, vocabulary contests, and categorization games. Grammar was taught through sentence-building games, fill-in-the-blank activities, timed grammar challenges, and rule-based games. Listening skills were strengthened through auditory recognition games, group dictation, listening competitions, and conversation simulations. Speaking skills were practiced through role-play, picture-based conversations, group interviews, and collaborative storytelling. Reading skills were developed through reading comprehension contests, speed-reading games, textual puzzles, and interactive reading tasks. Writing skills were reinforced through collaborative story writing, picture-based sentence construction, creative writing with cards, and group letter-writing activities. Pronunciation was practiced through listen-and-repeat games, pronunciation contests, sound imitation, and phonological games. Situational language use was strengthened through simulations, practical role-play, situational problem solving, cultural role-play, and everyday interactions.

The third component emphasized psychological and motivational features of learning. The package was designed

to increase autonomy, competence, relatedness, curiosity, self-efficacy, emotional engagement, and meaningfulness while reducing language-learning anxiety. Students were allowed to choose learning paths, select levels of difficulty, regulate their pace of progress, and personalize some aspects of their learning environment. Competence was promoted by presenting challenges appropriate to students' ability levels, providing positive feedback, and making progress visible. Relatedness was supported through pair work, small-group activities, cooperative tasks, and positive peer interactions. Curiosity was stimulated through unexpected challenges, language puzzles, unfinished stories, and hidden-rule discovery tasks. To reduce anxiety, the classroom climate was designed to be safe, supportive, and nonjudgmental, with greater emphasis on encouragement than punishment. Small successes, peer modeling, and repeated opportunities for successful task completion were used to strengthen students' beliefs in their English learning ability. The intervention also attempted to make learning more meaningful by linking English tasks to real-life situations, personal goals, everyday communication, and students' perceived needs.

The fourth component concerned the technical and executive requirements necessary for implementing the package effectively. Both digital and non-digital games were used, including individual games, pair activities, small-group games, and multiplayer tasks. Students were organized in pairs and groups of three to five members, with both homogeneous and heterogeneous grouping used depending on the purpose of each activity. Some groups remained stable across activities, while others changed rotationally to increase interaction among students. The physical classroom arrangement was adapted to support movement-based games, group interaction, individual tasks, and the use of game stations. Instructional tools included flashcards, game cards, dice, tokens, tablets or smartphones where available, whiteboards, colored markers, projectors, speakers, and headphones. Simple and transparent rules were introduced before each activity, and in some tasks, students participated in defining or modifying the rules. Digital platforms and applications such as Kahoot, Wordwall, Quizlet, local educational applications, Lingonix, and Duolingo were used when appropriate to support interactive language learning. Accessibility was also considered through the use of low-cost, simple, and device-compatible activities.

The fifth component focused on evaluation and monitoring during the intervention. Assessment was

conducted continuously and multidimensionally to monitor both learning outcomes and learning processes. Formative evaluation included staged scoring, descriptive feedback, performance-based assessment, learning-path tracking, and skill checklists. Final evaluation included comprehensive game-like assessments, leveled final tasks, final projects, accumulated scores, and adaptive testing activities. Self-assessment was encouraged through self-evaluation forms, personal learning profiles, post-game reflection, personal goal setting, and comparison with previous individual performance. Peer assessment was implemented through group scoring, constructive criticism, selection of best performances, reciprocal feedback, and two-way evaluation. Reward systems included symbolic rewards, group rewards, surprise rewards, and progress-based rewards. Scoreboards, weekly and monthly progress displays, anonymous score tables, group score tables, and progress charts were used to make learning development visible. Student participation was monitored through daily participation records, participation charts, qualitative observation, and self-reported engagement. Feedback from students and performance data were also used to help the teacher improve the instructional process and adjust the game elements during implementation.

2.4. Data Analysis

Data analysis was conducted using both descriptive and inferential statistical methods in SPSS version 25. Descriptive statistics, including mean and standard deviation, were used to summarize students' scores in the variables of analysis, evaluation, and creation at the pretest and posttest stages. To test the research hypothesis and determine the effectiveness of the game-based educational package on the combined dependent variables, Multivariate Analysis of Covariance (MANCOVA) was applied. The pretest scores were controlled as covariates, and the posttest scores of the experimental and control groups were compared across the three higher-order cognitive levels. The significance level for hypothesis testing was set at $p < .05$.

3. Findings and Results

The findings presented in Table 1 show that the mean scores of higher-order cognitive levels, including analysis, evaluation, and creation, were relatively similar in the control and experimental groups at the pretest stage, indicating the relative homogeneity of the two groups before the implementation of the educational intervention.

Specifically, the mean score for analysis was 10.30 in the control group and 10.97 in the experimental group; the mean score for evaluation was 9.97 in the control group and 10.17 in the experimental group; and the mean score for creation was 9.15 in the control group and 9.60 in the experimental group. However, considerable changes were observed in the experimental group at the posttest stage. The mean score for analysis increased from 10.97 to 14.25, the mean score for evaluation increased from 10.17 to 13.72, and the mean score for creation increased from 9.60 to 13.15. In contrast, the increases in the control group were very limited, with the mean score for analysis increasing from 10.30 to 11.12,

evaluation from 9.97 to 10.55, and creation from 9.15 to 9.80. This pattern indicates that the implementation of the developed educational package had a positive effect on improving students' higher-order cognitive levels and led to a considerable increase in analytical, evaluative, and creative abilities among students in the experimental group compared with the control group. Therefore, descriptively, it can be stated that the educational package based on purposeful learning activities provided a suitable context for strengthening higher-order thinking among tenth-grade students.

Table 1

Descriptive Statistics of the Variables in the Control and Experimental Groups at Pretest and Posttest

Variable	Group	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation
Analysis	Control	10.30	2.238	11.12	3.012
Analysis	Experimental	10.97	2.764	14.25	3.218
Evaluation	Control	9.97	2.572	10.55	2.655
Evaluation	Experimental	10.17	2.267	13.72	2.881
Creation	Control	9.15	2.300	9.80	2.142
Creation	Experimental	9.60	1.832	13.15	2.611

The results presented in Table 2 show that the control and experimental groups differed significantly in the posttest scores of analysis, $F(1, 39) = 28.44$, $p = .001$, $\eta^2 = .448$; evaluation, $F(1, 39) = 62.92$, $p = .001$, $\eta^2 = .643$; and creation, $F(1, 39) = 67.25$, $p = .001$, $\eta^2 = .658$. These findings indicate the significant effect of the game-based English

language educational package on each dependent variable. The effect size of the game-based English language educational package was .448 for analysis, .643 for evaluation, and .658 for creation among tenth-grade students.

Table 2

Results of MANCOVA for Comparing Posttest Scores of Analysis, Evaluation, and Creation in the Control and Experimental Groups

Source	Dependent Variable	Sum of Squares	df	Mean Square	F	p	η^2
Group	Analysis	54.788	1	54.788	28.44	.001	.448
Group	Evaluation	80.085	1	80.085	62.92	.001	.643
Group	Creation	78.828	1	78.828	67.25	.001	.658

4. Discussion

The present study aimed to investigate the effectiveness of a game-based educational package for the tenth-grade English language course on students' higher-order cognitive levels, including analysis, evaluation, and creation. The findings revealed that students who participated in the game-based instructional program demonstrated significantly higher posttest scores in all three higher-order cognitive dimensions compared with students who received traditional instruction. The multivariate analysis further indicated

substantial effect sizes for analysis, evaluation, and creation, suggesting that the intervention was not only statistically significant but also educationally meaningful. These results indicate that integrating gamification principles into English language instruction can enhance learners' ability to engage in deeper cognitive processing and support the development of advanced thinking skills.

One of the most important findings of the study was the significant improvement in students' analytical abilities following participation in the game-based educational package. Analysis, as a higher-order cognitive process,

requires learners to identify relationships, distinguish components, recognize patterns, and interpret information within meaningful contexts. The structure of the intervention package provided numerous opportunities for students to engage in these processes through problem-solving activities, language puzzles, vocabulary classification tasks, grammatical challenges, and contextual language interpretation exercises. Unlike traditional approaches that often emphasize memorization and repetition, the game-based activities required students to actively interact with linguistic content and make sense of complex language structures. This finding is consistent with previous research emphasizing the role of active and cognitively engaging instructional approaches in developing analytical thinking skills among language learners (Du & Zhang, 2022; Hastuti et al., 2022). Similarly, studies examining critical-thinking-oriented language instruction have reported that learners demonstrate greater analytical competence when instructional activities require interpretation, comparison, and reasoning rather than simple recall (Işıklı, 2021; Taherkhani & Gholizadeh, 2024).

The improvement in analysis can also be interpreted through the motivational mechanisms embedded within the gamified environment. The use of points, levels, challenges, and immediate feedback likely increased students' cognitive engagement and sustained attention during learning activities. When learners become more engaged with instructional content, they tend to invest greater mental effort in processing information, leading to deeper understanding and stronger analytical performance. This explanation aligns with findings indicating that gamified environments increase cognitive engagement and facilitate meaningful learning experiences (Inayati & Waloyo, 2022; Temel & Cesur, 2024). Furthermore, the incorporation of digital and interactive learning experiences has been shown to stimulate learners' active participation and improve their ability to process complex information (Abdolmaleki & Saeedi, 2024; Rutkienė et al., 2022).

The results also demonstrated a significant positive effect of the game-based educational package on students' evaluative abilities. Evaluation represents the capacity to judge the quality, appropriateness, or effectiveness of information based on established criteria. In the present intervention, students frequently engaged in activities requiring them to compare language structures, assess alternative responses, critique communicative choices, and provide feedback to peers. Such experiences likely enhanced their ability to make reasoned judgments regarding language

use and communicative effectiveness. These findings support the growing body of literature suggesting that instructional environments promoting active decision-making and reflection contribute to the development of evaluative thinking skills (Soe, 2024; Tuxtayevech et al., 2024).

The significant gains in evaluation are particularly noteworthy because many traditional English language classrooms provide limited opportunities for students to engage in evaluative reasoning. Previous textbook analyses have revealed that instructional materials often focus predominantly on lower-level cognitive activities, leaving little room for judgment, critique, and evidence-based reasoning (Dallashah, 2024; Ng & Jeyaraj, 2023). By contrast, the game-based educational package intentionally integrated challenges that required students to assess alternatives, justify decisions, and reflect on outcomes. Such activities align closely with recommendations made by scholars advocating for the incorporation of critical thinking within language education (Du & Zhang, 2022; Taherkhani & Gholizadeh, 2024). The present findings therefore provide empirical support for the argument that gamified instruction can serve as an effective vehicle for promoting evaluative thinking within English language learning contexts.

Another important finding was the substantial improvement in students' creative abilities. Creation occupies the highest level of Bloom's revised taxonomy and involves generating novel ideas, producing original responses, and synthesizing knowledge in innovative ways. The intervention included multiple activities designed specifically to stimulate creativity, including collaborative storytelling, dialogue construction, role-playing, creative writing tasks, scenario development, and problem-solving challenges. These activities required students not only to apply existing linguistic knowledge but also to produce original language outputs and adapt their responses to new situations. The significant gains observed in the creation dimension suggest that the game-based educational package successfully created conditions conducive to creative language use and expression.

The positive impact on creativity is consistent with recent evidence highlighting the relationship between gamification and creative thinking development. Research has shown that game-based learning environments encourage experimentation, exploration, and risk-taking, all of which are important foundations for creativity (Kaur et al., 2025; Shafiei Sarvestani et al., 2025). Similarly, playful pedagogical approaches have been associated with increased

originality, flexibility, and creative problem-solving among learners (Li et al., 2025). The narrative and challenge-based structure of the intervention likely contributed to these outcomes by providing students with authentic opportunities to generate ideas and express themselves creatively in English. Moreover, the supportive and low-anxiety nature of the gamified environment may have reduced students' fear of making mistakes, thereby encouraging greater creative experimentation and language production (Ahmed et al., 2022).

The findings of the present study also support broader theories of learning and motivation. According to self-determination theory, learners are more likely to engage deeply with learning tasks when their needs for autonomy, competence, and relatedness are satisfied. The game-based educational package incorporated all three of these motivational components. Students were provided with opportunities to make choices regarding tasks and learning pathways, which enhanced autonomy. Progressive challenges, visible achievements, and immediate feedback supported perceptions of competence. Collaborative activities and team-based challenges strengthened social interaction and relatedness. These motivational conditions likely contributed to the observed improvements across all higher-order cognitive dimensions. Previous studies have similarly reported that gamification enhances learner motivation, engagement, and persistence, which in turn facilitate stronger academic outcomes (Ahmed et al., 2022; Inayati & Waloyo, 2022; Temel & Cesur, 2024).

The current findings are further supported by research emphasizing the importance of active learning in English language education. Active learning approaches position learners as active constructors of knowledge rather than passive recipients of information. The game-based package employed in this study embodied many principles of active learning through collaborative problem-solving, interactive challenges, discussion-based activities, and learner-centered tasks. Previous investigations have demonstrated that active learning strategies improve students' engagement, comprehension, and critical thinking abilities in language classrooms (Duresa, 2023; Mahdi, 2024). Therefore, the positive outcomes observed in the present study may be attributed not only to the gamified elements themselves but also to the active and participatory nature of the learning experiences they facilitated.

The findings also have important implications for curriculum development and instructional design in English language education. Several researchers have expressed

concern regarding the limited representation of higher-order cognitive skills within English language textbooks and instructional materials (Dallashah, 2024; Hasnah et al., 2023; Ng & Jeyaraj, 2023). The present study demonstrates that intentionally designed educational packages can supplement existing curricula and provide meaningful opportunities for higher-order thinking development. Through the integration of game mechanics with language-learning objectives, educators can create instructional environments that simultaneously support language acquisition and cognitive growth. This is particularly important in contemporary educational contexts where learners are expected to possess not only linguistic competence but also critical thinking, creativity, and problem-solving skills (Taherkhani & Gholizadeh, 2024; Tuxtayevich et al., 2024).

Another noteworthy aspect of the findings concerns the role of technology-supported learning environments. Although the intervention included both digital and non-digital activities, many of its features reflected current trends in educational technology and digital gamification. Previous studies have highlighted the effectiveness of technology-enhanced language instruction in promoting engagement, interaction, and cognitive development (Abdolmaleki & Saeedi, 2024; Muthmainnah et al., 2022). Research on digital gamification and AI-supported learning has further demonstrated positive effects on learning outcomes and higher-order cognitive skills (Charunin et al., 2024; Kaur et al., 2025). The present findings therefore contribute to the growing evidence base supporting the integration of innovative technologies and gamified methodologies into language education.

Furthermore, the results align with studies examining the effectiveness of specific game-based and interactive instructional techniques in language learning. Vocabulary games, reading comprehension innovations, inferencing activities, and communicative language tasks have all been shown to enhance various dimensions of language performance and cognitive engagement (Sayed, 2022; Shafie et al., 2024; Shahid et al., 2024; Zakaria et al., 2023). The current study extends these findings by demonstrating that a comprehensive and systematically designed game-based educational package can influence not only discrete language skills but also broader cognitive capacities associated with analysis, evaluation, and creation.

5. Conclusion

Taken together, the findings indicate that the game-based educational package constituted an effective instructional intervention for promoting higher-order cognitive learning in the tenth-grade English language course. The significant improvements observed across all three cognitive dimensions suggest that gamification can serve as a powerful pedagogical approach capable of transforming traditional language instruction into a more engaging, intellectually stimulating, and cognitively demanding educational experience. By combining motivational game elements with meaningful language-learning activities, the intervention successfully fostered deeper cognitive engagement and contributed to the development of analytical, evaluative, and creative thinking skills among students.

Despite the promising findings, several limitations should be acknowledged. First, the study was conducted with a relatively small sample of students from a single city, which may limit the generalizability of the findings to other educational settings and populations. Second, the duration of the intervention was limited to eight weeks, making it difficult to determine whether the observed effects would be maintained over longer periods. Third, the study relied on a researcher-developed assessment instrument, and although its psychometric properties were carefully evaluated, the use of additional standardized measures could provide stronger evidence of effectiveness. Finally, the study focused exclusively on higher-order cognitive outcomes and did not examine other potentially important variables such as learner attitudes, self-efficacy, classroom engagement, or long-term language proficiency development.

Future studies should examine the effectiveness of game-based educational packages using larger and more diverse samples across different educational levels and geographical regions. Longitudinal research is needed to investigate the durability of cognitive gains over time and to determine whether improvements in higher-order thinking are maintained after the completion of the intervention. Researchers may also compare different forms of gamification, including digital, non-digital, and AI-supported approaches, to identify the most effective design features for promoting higher-order cognition. Additionally, future investigations could explore the mediating roles of motivation, engagement, self-efficacy, and collaborative learning in explaining the relationship between gamification and cognitive development.

Educational policymakers and curriculum developers should consider integrating structured game-based learning activities into English language curricula to promote higher-order thinking skills alongside language proficiency. Teachers should receive professional development opportunities that equip them with the knowledge and skills required to design and implement effective gamified learning environments. Schools should provide the technological and instructional resources necessary to support innovative teaching approaches. Finally, classroom instruction should increasingly emphasize analytical reasoning, evaluative judgment, and creative production through engaging, learner-centered activities that encourage active participation and meaningful interaction with language content.

Authors' Contributions

Authors equally contributed to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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