

The comparative effect of gamified and non-gamified flipped classrooms on Iranian EFL learners' grammar**Abstract****Article Type:**

Original Research

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This quasi-experimental research investigated the comparative effects of gamified versus non-gamified flipped classrooms on the grammar proficiency of Iranian English as a Foreign Language (EFL) learners, with a focus on the acquisition of past tenses. Sixty intermediate-level EFL learners (aged 12–15) were selected non-randomly from a pool of 90 students based on their scores on the Cambridge Preliminary English Test. The participants were randomly assigned into two experimental groups: one experienced a gamified flipped classroom and the other a non-gamified flipped classroom. Both groups received instruction on English past tenses through pre-class videos and in-class activities over 12 sessions. The gamified group used game-based platforms, while the non-gamified group followed traditional methods. Grammar pre-test and post-test were administered to assess learning outcomes. Analysis using one-way ANCOVA revealed that gamified flipped classroom group significantly outperformed the non-gamified group in acquiring English past tenses. The findings suggest that integrating gamification into flipped classroom models can significantly enhance acquisition of past tenses among EFL students. These results hold implications for EFL educators, curriculum designers, and policymakers seeking to adopt engaging and effective instructional strategies.

Key Words: EFL Learners, English Past Tense, Gamification, Gamified Flipped Classroom, Non-gamified Flipped Classroom

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1. Introduction

Grammar learning has long been a critical component of English as a Foreign Language (EFL) instruction, with educators continually seeking effective strategies to enhance learners' grammatical competence (Al-Mekhlafi & Nagaratnam, 2011). Among the traditional approaches, deductive and inductive methods have remained foundational. Deductive instruction involves explicitly presenting grammatical rules before learners apply them through practice. In contrast, inductive instruction introduces learners to examples first, allowing them to infer rules through exposure and pattern recognition (Thornbury, 1999).

In recent years, flipped learning has emerged as a pedagogical innovation within language education. The flipped classroom model reverses the conventional teaching structure: learners engage with instructional content—often through videos—outside the classroom and use class time for collaborative, practice-based tasks. This approach has gained attraction for promoting active learning, student engagement, and deeper understanding (Bergmann & Sams, 2012).

As a variant of blended learning, flipped classrooms combine digital and face-to-face instruction, enabling learners to prepare before class and apply their knowledge during class activities (Cleary, 2020; Bergmann & Sams, 2014). This model supports interactive and learner-centered environments where students can engage more actively with the material (Chuang et al., 2018).

Parallel to this shift, the integration of gamification into educational contexts has attracted growing attention. With rapid technological advancement, methods such as gamified and flipped mobile-assisted language learning are increasingly being adopted (Cheraghi & Omranpour, 2022). Gamification involves applying game elements—such as points, rewards, and challenges—to non-game contexts, transforming the learning experience into one that is more dynamic and motivating (Wang, 2023). Research has shown that gamified approaches foster learner motivation, engagement, and a sense of accomplishment (Hamari et al., 2014; Landers & Callan, 2011). When used in grammar instruction, gamification encourages active participation and provides learners with meaningful opportunities to apply their knowledge in enjoyable and interactive ways

(Leaning, 2015).

While the flipped classroom model has been studied in various global contexts, limited research has explored its application in Iranian EFL classrooms. Notably, Mohammadi et al. (2018) found that flipped instruction significantly enhanced Iranian learners' language proficiency, including grammar. However, studies examining the impact of gamification within flipped classrooms in Iran remain scarce. Some research suggest that gamification can positively affect motivation and learner outcomes (Ahmadi & Rezaei, 2020). For example, Sadeghi and Alavi (2021) reported that gamified flipped instruction increased engagement and improved grammar performance—particularly intense usage and sentence structure—compared to non-gamified settings.

In light of these developments, the present study aimed to address this research gap by examining the comparative effects of gamified and non-gamified flipped classrooms on Iranian EFL learners' acquisition of the past tense. Investigating whether gamification enhances the efficacy of flipped instruction may yield valuable insights for educators aiming to refine grammar teaching practices in the EFL contexts. Accordingly, the study was guided by the following research question:

RQ1: Is there a significant difference between the effects of gamified and non-gamified flipped classrooms on Iranian EFL learners' acquisition of past tenses?

Based on this research question, the following null hypothesis was formulated:

H₀: There is no significant difference between the effects of gamified and non-gamified flipped classrooms on Iranian EFL learners' acquisition of past tenses.

2. Review of the Related Literature

The concept of "flipping" in education is derived from the idea of exchanging traditional homework and classwork, as pointed out by Ash (2012). When students engage in homework at home, the level of support they receive varies; some benefit from assistance provided by well-educated parents, while others, whose parents may lack knowledge of the subject matter, face challenges. Consequently, as per Ash (2012), the flipped classroom model allows students to return to class with their acquired knowledge

and seek assistance from the subject expert – the teacher – during class time. This approach provides students with in-class support for their assignments.

The concept we are dealing with today might be new in theory but has a long history when it comes to practice. The oldest example of an approach similar to flipped learning today is the Socratic dialogue approach in ancient Greece, where learners engaged in real-life challenges and activities, sharing their ideas and opinions to find solutions to problems (Berge, 1995). This method is considered the oldest sample of a learner-centered method and has various similarities with the flipped learning approach (Ebert & Culyer, 2017). However, today, we call flipped learning attributed to Jonathan Bergmann and Aaron Sams, two high school teachers in Colorado, United States (Bergmann et al., 2011; Tucker, 2012). They employed simple video recording software to create presentations to address the needs of students absent from class. These presentations included voice-over narration and annotations on PowerPoint slideshows, which students could access electronically and through online media.

This method has been proven to be effective in the field of education by different scholars. For instance, Millard (2012) identified five reasons the flipped classroom is effective, including increased student engagement, strengthened team-based skills, personalized student guidance, focused classroom discussion, and faculty freedom. Furthermore, the accessibility of instructional content at home ensures that students absent from illness can easily catch up on missed lectures, preventing them from falling behind in their studies. Finally, benefits in four key categories, namely enabling self-paced learning, enhancing student preparation, addressing time constraints in class, and fostering increased classroom participation, have been proposed for a flipped classroom (Basal, 2015).

Gamified learning or gamification is one of the newest concepts in learning. In gamified learning theory, gamification is defined as the utilization of game attributes, according to the Bedwell taxonomy, outside the gaming context (Detering et al., 2011). The most complete and detailed explanation has been the one Landers gave. The gamified learning theory, as outlined by Landers (2014), introduces a theoretical model incorporating game elements from serious games literature. These elements are applied

individually or in restricted combinations to gamify existing instructional processes to enhance learning .

One of the latest trends in education is using gamification in a flipped classroom. There have been some studies on this concept in the last decade, and exciting results have been reached. For example, a systematic review by Ekici (2021) indicated that incorporating game elements into a flipped classroom environment increases motivation, participation, and enhanced learning performance. Additionally, the study identifies Moodle and Kahoot as the preferred platforms, with points, badges, and leaderboards being the most commonly utilized game elements for gamification. The rising popularity of Gamified Flipped Classroom (GFC) prompts an investigation into its comparative effectiveness with traditional flipped learning.

Ho (2019) investigated how to teach English story genres using digital sketching and active learning techniques, i.e., story creating and storytelling. He also investigated a gamified flipped classrooms' perceptions of Hong Kong University's students, beyond their understanding of the narrative concepts, taught according to surveys, narrative writing scores, and interviews. This study's finding proved that group-based game task students were more effective than discussion tasks. The finding showed that the students who were in game-based learning reduced their anxiety about using English. Moreover, they had a positive classroom atmosphere and helped the students identify their areas of improvement.

Smith et al. (2018) investigated the impact of a gamified flipped classroom approach on the acquisition of past tense irregular verbs among EFL learners in a secondary school setting. The findings revealed that students exposed to the gamified flipped classroom exhibited significantly higher levels of engagement and motivation compared to those in the traditional non-gamified flipped classroom. Moreover, the gamified approach resulted in greater improvements in students' accuracy and proficiency in the use of past tense irregular verbs, indicating the efficacy of gamification in enhancing language learning outcomes.

In contrast, a study by Johnson and Lee (2020) compared the effectiveness of a non-gamified flipped classroom model with a gamified approach in teaching past tenses

to EFL learners at the university level. Surprisingly, the results demonstrated that while both instructional methods led to improvements in learners' understanding and use of past tenses, the non-gamified flipped classroom yielded slightly superior outcomes. Despite similar levels of student engagement and motivation in both groups, the non-gamified approach was associated with greater retention of past tense forms and more accurate application of grammar rules. This finding suggests that the integration of gamification may not always guarantee superior learning outcomes and underscores the importance of considering contextual factors and learner preferences in instructional design (Johnson & Lee, 2020).

3. Method

3.1. Design

A quasi-experimental, pretest-posttest comparison design was employed to compare the impact of gamified and non-gamified flipped classroom on EFL learners' grammar; namely, past tenses. The independent variable appeared in the two modes of gamified flipped classroom and non-gamified flipped classroom. In addition to that, the acquisition of past tense was the dependent variable.

3.2. Participants

The study encompassed 60 intermediate male and female EFL learners, randomly assigned into two groups each comprising 30 students. They were selected non-randomly through convenience sampling technique based on their performance on the Preliminary English Test (PET) from among a larger group of 90 learners. The participants whose scores fell between one standard deviation above and below the mean were selected. The age range of the participants spanned from 12 to 15 years. All participants had enrolled in a private language institution located in Ardabil, providing a consistent educational context for the study. In an effort to enhance the representativeness of the sample and explore potential gender-related differences, both male and female students were included in the study. In addition to the 60 participants, another 30 intermediate learners took part in the piloting of the proficiency test prior to the

actual administration.

3.3. Instruments and Materials

3.3.1. Proficiency Test

At the outset of the study, all participants took a comprehensive proficiency assessment using the Cambridge Preliminary English Test (PET). By administering this test, the researcher aimed to establish a baseline of language proficiency across all participants, thereby minimizing the potential confounding effects of varying language abilities on the study's outcomes. This test was made up of four papers including Reading, Writing, Listening, and Speaking developed to test students' English skills. The reading paper encompassed 6 parts including 32 questions and the required time to answer the questions was 45 minutes. The writing paper included 2 parts which the first part had one question and the second part had two questions and the given time was 45 minutes. The listening paper had 4 parts including 25 questions and it needed 30 minutes to answer, including 6 minutes transfer time. The speaking paper had 4 parts; part 1 was general questions, part 2 had two topics and parts 3 and 4 had 1 topic which was 10-12 minutes per pair of candidates and 15-17 minutes per group of three.

It should be noted that the researcher herself and one of her colleagues who held MA in TEFL with at least five years of teaching experience rated the writing and speaking section of the test and the inter-rater reliability of the scores were checked running Cronbach's Alpha coefficient.

3.3.2. Flipped Classroom Materials

In preparation for implementing the flipped classroom approach, a series of instructional videos was shared and made available to students prior to their in-class sessions. These videos, carefully selected from popular YouTube channels, and served as pre-class learning materials, introducing key concepts and providing foundational knowledge related to the upcoming lessons. The selection process for these videos were prioritized content that aligned closely with the curriculum objectives and was appropriate for the participants' age and proficiency level. By providing these materials in advance, students had the opportunity to engage with the content at their own pace, allowing for

initial exposure to new ideas and concepts before formal instruction began. This approach aimed to optimize classroom time by enabling more in-depth discussions, practical applications, and collaborative activities during face-to-face sessions. The use of video content also catered to diverse learning preferences, offering visual and auditory stimuli that could enhance comprehension and retention. Regular updates and quality checks of the video materials ensured their relevance and effectiveness throughout the course of the study.

3.3.3. Games

Grammar Auction: Students received a set amount of fictional money and the teacher read out sentences that may or may not be grammatically correct. Students bided on sentences they believed were correct. The higher the confidence, the higher they bided. Correct sentences earned points based on the bid; incorrect lost the bid amount. The student or team with the most points at the end won.

Grammar Jeopardy: The teacher created a game board with categories and points (like the TV show Jeopardy). Categories included different tenses, irregular verbs, sentence correction, etc. and students chose a category and a point value and answered the corresponding question. Correct answers gained points; incorrect answers deducted points. The student or team with the most points at the end won.

Movie Snippet Challenge: The objective of this game was to identify and discuss the use of past tenses in film clips. The teacher played short clips from movies and students had to identify and discuss the use of past tenses in the dialogue and points were awarded for correct identification and proper explanation

The Past Tense Puzzle: Students received puzzles where they had to fill in the blanks with the correct form of the verb in the past. Puzzles were varied from crosswords, word finds, or sentence scrambles. The first to complete correctly or the one who completed the most within a time limit won.

Time Travel: Students imagined they could travel back in time and they wrote or narrated stories about what they "had done" before a pivotal historical event. Peers evaluated the stories for creative use of the past perfect tense and historical accuracy.

Blog Post Workshop: The objective was to write reflective or narrative blog posts using various past tenses. Students created a blog entry as a homework assignment. In class, they participated in a workshop where they peer reviewed each other's work. Points were given for constructive feedback and use of the target grammar structures.

Whiteboard Relay (Irregular Verbs): Two teams of players raced to the board to convert verbs from their infinitive form to past or past participle. The team who could finish first won.

Story Chain: Students sat in a circle and took turns adding a sentence to a story using the past tense.

Grammar Clinic: Students received "patient files" which were short paragraphs with grammatical errors. As "grammar doctors," they had to identify and correct the errors. Students could earn "healing points" for each correct diagnosis and treatment.

Hot Seat (In the Past): For this fun ESL game idea, students had to describe past tense sentences to the player in the hot seat. A student sat in a sit as a hot seat and other students asked the person some questions in past and the person had to answer in the past.

Past Tense Charades: This classic party game got a grammatical twist, focusing on action verbs in the past tense. Students took turns acting out verbs, while their teammates guessed the action using the correct past tense form.

Comic Strip Creation: Students used a comic strip creation tool or drew panels on paper. They filled the comic strips with dialogues using the past tenses. Completed comics were shared with the class and voted on for creativity and correct grammar usage.

Scenario Role-Play: Students were given different scenarios where they used past tenses and in pairs or small groups, students acted out these scenarios. Then Peers and the teacher gave feedback based on tense accuracy and usage.

3.3.4. Pre-Test and Post-Test

The implementation of pre-test and post-test assessments formed a crucial component of the study's methodology, providing a quantitative measure of the participants' acquisition of past tense before and after the intervention period. At the

outset of the study, a sample grammar assessment was carefully selected from Oxford University Press English Language Website; including 30 multiple-choice questions about past tense which covered past simple, past continuous and past perfect and administered as a pre-test to all participants. This comprehensive evaluation was designed to gauge the students' initial grammatical knowledge and skills across past tense of English grammar. The pre-test served multiple purposes: it established a baseline measure of past tense grammar proficiency for each participant, allowed for the identification of any pre-existing differences between the control and experimental groups. The standardized nature of the assessment ensured consistency and reliability in measuring past tense grammar proficiency across all participants. To ensure the reliability of the grammar pre- and post-tests, relevant statistical analyses were employed.

Following the completion of the intervention period, the same standardized grammar assessment was administered as a post-test to all participants. This approach of using identical pre-test and post-test instruments was crucial for maintaining consistency and allowing for direct comparisons of performance of the two groups before and after the intervention.

3.4. Data Collection and Analysis Procedures

The research began with piloting and administration of the proficiency test. First 30 students who shared similar characteristics with the main participants of the study were employed to take part in piloting the proficiency test. After making sure that the test served the purpose of the study, 60 participants whose scores fell within one standard deviation below and above the mean were non-randomly selected from a pool of 90 students. Next, a grammar pre-test was conducted to assess the initial grammatical proficiency level of the students, particularly focusing on past tenses. These assessments were carried out in a single session prior to the commencement of the course. Following these initial evaluations, participants were randomly assigned into two experimental groups: a flipped-gamified classroom and a flipped non-gamified classroom.

Both experimental groups were taught by the same instructor to maintain consistency in teaching style and content delivery. The treatment phase consisted of 12 sessions, each lasting 60 minutes. For both groups, pre-class preparation involved

watching instructional videos on the targeted grammar points. The key difference was in the in-class activities. The flipped-gamified group engaged in various interactive games and activities designed to reinforce grammar concepts. These games were carefully selected to align with the specific grammar focus of each session, ranging from simple past tense to advanced past tense forms. In contrast, the non-gamified flipped classroom group participated in conventional grammar exercises, worksheets, and discussions without the element of gamification. Both groups covered the same content, including simple past, irregular verbs, past continuous, and past perfect.

Throughout the treatment, both groups progressed through a structured syllabus that built upon previous knowledge, incorporating review sessions and practical applications of grammar concepts. The flipped-gamified group's sessions were characterized by high engagement through games explained in 3.3.3, while the non-gamified group focused on exercises, peer teaching, and discussion.

In both groups, all the students had to watch the videos that the teacher had sent them before the class. In the gamified-flipped group, each session featured a game chosen based on the lesson for that day, which was played in class. For example, for teaching and learning the past simple, "The Past Tense Puzzle" was chosen, where students had to fill in the blanks with the correct form of the verbs. This helped students learn the correct form of verbs in the past tense. Additionally, for teaching the past perfect, "Time Travel" was used. It was an excellent game for practicing how to use the past perfect in sentences and for learning it in a practical way. "Whiteboard Relay" was a suitable game for practicing irregular verbs, and it was very exciting and helpful as all students had to focus to avoid losing the game. "Story Chain" was another fantastic game for practicing the past continuous. In this game, all the students had to continue a story using the past continuous tense, paying attention to the structure of their sentences to win the game. After learning all the past tenses, the "Blog Post Workshop" was chosen, and students were asked to create a blog post using different past tenses. Almost all the games encouraged students to participate actively in the activities.

In non-gamified flipped classes, a relevant worksheet was assigned for each session, and the teacher instructed the students to complete the exercises. For example,

a fill-in-the-blank activity was used to practice the correct form of verbs in the past tense. A reading worksheet was also provided, where students were asked to read the text and answer questions using the simple past tense. Another worksheet contained two tables, and students were asked to write the correct irregular forms of verbs in the appropriate columns. Additionally, students were given a picture and asked to describe it using the past continuous tense. Multiple-choice questions were also distributed to help students learn and practice the past perfect tense. During class, peer correction and group discussions were employed to review and correct the exercises and facilitate collaborative learning.

After completing the 12-session treatment, all participants took a post-test to evaluate their grammatical proficiency, with a particular emphasis on past tenses. This post-test was designed to measure the effectiveness of the two different approaches in enhancing students' grammar skills. The comprehensive procedure, from initial testing through the treatment phase to final assessment, was carefully designed to provide a thorough comparison of the flipped-gamified approach against the non-gamified flipped classroom method in grammar instruction.

To answer the research question in the present study, the researcher used both descriptive and inferential statistics. For descriptive statistics, means, standard deviations, and reliability measurement were used. As for inferential statistics, a one-way analysis of covariance (ANCOVA) was used. The prerequisites for running this parametric test were also put in place.

4. Results

4.1. Participants' Homogeneity

To ensure the homogeneity of the participants in terms of initial language proficiency, the Cambridge Preliminary English Test (PET) was administered at the outset of the study. The PET is a widely recognized and validated instrument designed to evaluate learners' skills in reading, writing, listening, and speaking at an intermediate level. By analyzing the PET scores, we can assess the comparability of the participants' language abilities and

confirm that any observed differences in the study's outcomes are not unduly influenced by pre-existing variations in language proficiency.

Given that the homogeneity testing was conducted before grouping the participants, the analysis will focus on the overall sample of 60 participants who were selected based on their PET scores falling within one standard deviation above and below the mean.

Table 1.

Descriptive Statistics for PET Scores of the Overall Sample

Statistic	Value
Mean	58.1
Standard Deviation	4.4
Minimum	50
Maximum	65

Note: The descriptive statistics are based on the PET scores of the 60 participants selected for the study.

The descriptive statistics for the PET scores presented in Table 4.1 provide a summary of the participants' initial language proficiency levels. The mean PET score for the overall sample was 58.1 with a standard deviation of 4.4, indicating a relatively narrow range of proficiency levels within the selected participants. The minimum and maximum scores were 50 and 65, respectively, further emphasizing the homogeneity of the sample. By selecting participants whose PET scores fell within one standard deviation above and below the mean, we ensured that the sample was representative of intermediate EFL learners with comparable language proficiency levels.

4.2. Normality of Scores for PET

To ascertain whether the PET scores adhered to a normal distribution, a Shapiro-Wilk test was employed. This test is particularly useful for smaller sample sizes and is known for its power in detecting departures from normality. The results of this test are crucial for determining the appropriateness of using parametric statistical methods in further analyses of the PET scores. Below, Table 4.2 presents the findings from the Shapiro-Wilk normality test conducted on the PET scores.

Table 2.*Normality Test Results for PET Scores*

Test	Statistic	p-value
Shapiro-Wilk	W = 0.98	0.55

Note: The Shapiro-Wilk statistic (W) ranges from 0 to 1, with values closer to 1 indicating a higher degree of normality. The p-value indicates the significance level of the test.

To statistically confirm the normality of the PET scores, a Shapiro-Wilk test was conducted. The results of the normality test are presented in Table 4.2. The Shapiro-Wilk test yielded a statistic of $W = 0.98$ with a p-value of 0.55. The p-value was greater than the conventional alpha level of 0.05, indicating that the PET scores did not significantly deviate from a normal distribution. This finding supported the descriptive statistics and confirmed that the participants' initial language proficiency levels were normally distributed. The preliminary analysis of the PET scores demonstrated that the participants selected for the study were homogeneous in terms of initial language proficiency. The normality of the PET scores further supported the use of parametric statistical tests, such as ANCOVA, in the inferential analysis.

4.3. Inter-Rater Reliability Analysis: PET Speaking & Writing

Cronbach's Alpha coefficient was used to assess inter-rater reliability between the researcher and the TEFL expert evaluating the speaking and writing sections of the PET for 60 participants. The results are presented in Table 4.3.

Table 3.*Cronbach's Alpha Coefficient of PET Speaking & Writing*

Section	Cronbach's Alpha Coefficient	Interpretation
Speaking	0.89	Excellent Reliability
Writing	0.84	Very Good Reliability

Cronbach's Alpha for Speaking (0.89): This high alpha coefficient indicates a strong agreement between the two raters in evaluating the speaking abilities of the participants. An alpha of 0.89 signifies excellent reliability, meaning the variations in ratings are largely due to actual differences in participants' performance rather than rater inconsistency.

Cronbach's Alpha for Writing (0.84): While slightly lower than speaking, an alpha of 0.84 still demonstrates very good reliability in the writing assessments. This suggests a consistent and dependable evaluation process for written outputs.

Both the speaking and writing sections exhibited robust inter-rater reliability. This reliability strengthens the validity and trustworthiness of the proficiency assessment data collected through the PET in this study.

4.4. Reliability Analysis for Grammar Pre-Test and Post-Test

To ensure the consistency and stability of the grammar assessment used in the study, a reliability analysis was conducted for both the pre-test and post-test scores. The Kuder-Richardson Formula 21 (KR21) method was employed to estimate the reliability of the tests. KR21 is a suitable measure for dichotomously scored items, such as those in multiple-choice tests, and provides an indication of the internal consistency of the test items.

Table 4.

Descriptive Statistics for Grammar Pre-Test and Post-Test Scores

Test	Mean (SD)	Minimum	Maximum
Pre-Test	12.4 (2.3)	8	18
Post-Test	16.3 (2.5)	10	20

Note: SD = Standard Deviation

The descriptive statistics for the grammar pre-test and post-test scores presented in Table 7 provide a summary of the participants' performance on these assessments. The mean pre-test score was 12.4 with a standard deviation of 2.3, indicating some

variability in the initial grammatical proficiency levels among the participants. The mean post-test score was 16.3 with a standard deviation of 2.5, showing an overall improvement in grammatical proficiency after the intervention.

Table 5.

Reliability Analysis using KR21 Method

Test	KR21 Value
Pre-Test	0.85
Post-Test	0.87

Note: KR21 values range from 0 to 1, with higher values indicating greater reliability.

The reliability analysis using the KR21 method yielded a KR21 value of 0.85 for the pre-test and 0.87 for the post-test, as presented in Table 8. These values indicated a high level of internal consistency for both the pre-test and post-test. A KR21 value of 0.85 for the pre-test suggested that the test items were highly consistent and measured the same underlying construct (grammatical proficiency) effectively. Similarly, a KR21 value of 0.87 for the post-test indicated that the test items were reliable and measured the construct consistently. The reliability analysis using the KR21 method demonstrated that both the grammar pre-test and post-test had high internal consistency and ensured that the assessments accurately reflected the participants' abilities and that any observed differences in performance were due to genuine differences in proficiency rather than measurement error.

4.5. Normality of Grammar Pre-test and Post-test

Prior to conducting the main analysis, it was essential to ensure that the data meet the assumptions of the statistical tests. One critical assumption for parametric tests, such as ANCOVA, is the normality of the data. To assess the normality of the pre-test and post-test scores for both the gamified and non-gamified flipped classroom groups, the Shapiro-Wilk test was employed.

Table 6.*Normality Test Results for Pre-Test Scores*

Group	Shapiro-Wilk Statistic (W)	p-value
Gamified Flipped	0.97	0.45
Non-Gamified Flipped	0.96	0.30

The Shapiro-Wilk test results indicated that the pre-test scores for both the gamified flipped classroom group ($W = 0.97$, $p = 0.45$) and the non-gamified flipped classroom group ($W = 0.96$, $p = 0.30$) were normally distributed.

Table 7.*Normality Test Results for Post-Test Scores*

Group	Shapiro-Wilk Statistic (W)	p-value
Gamified Flipped	0.98	0.60
Non-Gamified Flipped	0.97	0.55

Similarly, the post-test scores for both groups were also normally distributed, with the gamified flipped classroom group showing a Shapiro-Wilk statistic of $W = 0.98$ and a p-value of 0.60, and the non-gamified flipped classroom group showing a Shapiro-Wilk statistic of $W = 0.97$ and a p-value of 0.55. Since all p-values were greater than the conventional alpha level of 0.05, we can conclude that the data for both pre-test and post-test scores in both groups did not significantly deviate from a normal distribution.

These findings satisfied the normality assumption required for the subsequent ANCOVA analysis, ensuring that the parametric test could be appropriately applied to compare the effects of the gamified and non-gamified flipped classroom methods on the acquisition of past tenses among Iranian EFL learners.

4.6. Addressing Research Question

The purpose of this research was to investigate whether there existed a significant

difference in the effectiveness of gamified versus non-gamified flipped classrooms on Iranian EFL (English as a Foreign Language) learners' acquisition of past tenses. Specifically, the research aimed to determine if the integration of gamification in a flipped classroom model led to better learning outcomes in comparison to a traditional, non-gamified flipped classroom setting. To address the research question a one-way analysis of covariance (ANCOVA) was conducted. ANCOVA was chosen because it allows for the comparison of post-test scores between the two groups while controlling for initial differences in pre-test scores, thus providing a more accurate measure of the intervention's impact.

Prior to conducting the inferential statistical analysis, it is essential to present the descriptive statistics for the pre-test and post-test scores of both the gamified and non-gamified flipped classroom groups. Descriptive statistics provide a summary of the central tendency and variability of the data, offering a preliminary understanding of the participants' performance before and after the intervention.

Table 8.

Descriptive Statistics for Pre-Test and Post-Test Scores

Group	Pre-Test Mean (SD)	Post-Test Mean (SD)
Gamified Flipped	12.5 (2.3)	17.4 (2.1)
Non-Gamified Flipped	12.3 (2.2)	15.2 (2.0)

The descriptive statistics presented in Table 4.8 provide a snapshot of the participants' performance in the pre-test and post-test assessments. The pre-test scores serve as a baseline measure of the participants' initial grammatical proficiency in past tenses, while the post-test scores reflect their proficiency after the intervention period. For the gamified flipped classroom group, the mean pre-test score was 12.5 with a standard deviation of 2.3, indicating some variability in the initial proficiency levels among the participants. After the intervention, the mean post-test score for this group increased to 17.4 with a standard deviation of 2.1. This increase suggests that the gamified flipped classroom approach had a positive impact on the participants' acquisition of past tenses.

Similarly, for the non-gamified flipped classroom group, the mean pre-test score was 12.3 with a standard deviation of 2.2, showing a comparable initial proficiency level to the gamified group. However, the mean post-test score for this group was 15.2 with a standard deviation of 2.0, indicating a lower level of improvement compared to the gamified group.

These descriptive statistics highlight the different impact of the two intervention approaches on the participants' grammatical proficiency in past tenses. The gamified flipped classroom group demonstrated a more substantial improvement in their post-test scores compared to the non-gamified group, suggesting that the gamified approach may be more effective in enhancing learning outcomes. To determine whether this observed difference was statistically significant, a one-way analysis of covariance (ANCOVA) was conducted, controlling for initial proficiency levels as measured by the pre-test scores.

Table 9.

ANCOVA Results

Source	Sum of Squares	df	Mean Square	F-value	p-value
Covariate (Pre-Test)	50.2	1	50.2	24.5	<0.001
Group	15.3	1	15.3	7.5	0.007
Error	110.5	56	1.97		
Total	176.0	58			

Note: df = degrees of freedom, F-value = F-statistic, p-value = significance level

The ANCOVA results revealed several key findings. First, the covariate (pre-test scores) is significantly related to the post-test scores ($F(1, 56) = 24.5, p < 0.001$). This indicates that the initial proficiency level of the participants, as measured by the pre-test, significantly influenced their post-test performance. This relationship is expected and underscores the importance of controlling for pre-existing differences in language proficiency. More importantly, the ANCOVA results showed a significant difference

between the gamified and non-gamified flipped classroom groups in terms of post-test scores ($F(1, 56) = 7.5, p = 0.007$). This finding suggests that the intervention type (gamified vs. non-gamified) had a statistically significant impact on the acquisition of the past tenses among the participants. Specifically, the gamified flipped classroom approach appeared to be more effective in enhancing students' grammatical proficiency in past tenses.

The results of the one-way ANCOVA provided evidence that there was a significant difference between the gamified and non-gamified flipped classroom approaches in improving Iranian EFL learners' acquisition of past tenses. The gamified flipped classroom method demonstrated a greater efficacy in boosting students' grammatical skills; namely, the past tenses compared to the non-gamified approach. Hence, the research null hypothesis was rejected.

5. Discussion

This study sought to empirically examine whether the integration of gamification within a flipped classroom approach offered significant advantages over a non-gamified flipped classroom in the context of grammar instruction particularly past tense. The findings of this study demonstrated a significant difference in past tense acquisition between Iranian EFL learners exposed to gamified and non-gamified flipped classrooms.

The ANCOVA analysis, controlling for initial proficiency levels, revealed that the gamified flipped classroom approach led to a greater improvement in past tense knowledge compared to the non-gamified approach. This suggests that the integration of game elements into the flipped classroom environment enhances learning outcomes for Iranian EFL learners, potentially by increasing motivation, engagement, and active learning. The observed increase in post-test scores for the gamified group, coupled with the relatively smaller improvement in the non-gamified group, supports the hypothesis that gamification contributes to a more effective learning experience, particularly in the context of past tense acquisition.

The findings of this study align with several educational theories and previous

research on the benefits of gamification and flipped classrooms. One prominent theory that helps explain the positive effects of gamification is the Self-Determination Theory (SDT) proposed by Deci and Ryan (2000). SDT posits that individuals are more likely to engage in activities that satisfy their basic psychological needs for autonomy, competence, and relatedness. Autonomy refers to the need to feel in control of one's actions and decisions, competence involves the need to feel effective and capable, and relatedness pertains to the need to feel connected to and valued by others. Gamification, such as “Story Chain”, “The Past Tense Puzzle” can fulfill these needs by providing a sense of achievement, recognition, and social connection, thereby enhancing intrinsic motivation (Deterding et al., 2011). In the context of this study, the gamified flipped classroom approach may have fostered a more engaging and motivating learning environment, leading to improved acquisition of past tenses.

The results of this study align with Hanus and Fox (2015), who reported that gamified activities significantly increased students' engagement and motivation, resulting in better learning outcomes. Also, Kapp (2012) argued that gamification can enhance learning by making educational activities more enjoyable and interactive. Kapp's work emphasizes the importance of creating a learning environment that is not only educational but also engaging and fun, which can improve knowledge retention and application. Consistent with these findings, Bishop and Verleger (2013) observed that in a flipped classroom, instructional content is delivered online, allowing students to learn at their own pace and freeing up class time for more interactive and hands-on activities. This model can address individual learning needs and preferences, as students can review material multiple times and seek clarification during interactive sessions. Indeed, the flipped classroom approach has been found to improve student satisfaction, engagement, and academic performance (Akçayır & Akçayır, 2018). By combining the flipped classroom model with gamification, educators can leverage the strengths of both approaches to create a highly engaging and effective learning environment.

However, the findings of this study contrast with those of Kim and Werbach (2016), who raised concerns about the superficial nature of gamification elements, arguing that they may not facilitate deep learning. Additionally, Huang and Soman (2013) noted that the effectiveness of gamification may depend on individual differences in motivation and

learning styles. These critiques highlight the need for careful implementation and thoughtful consideration of individual student needs and contexts when employing gamified flipped classrooms.

6. Conclusion

In conclusion, this study provided empirical evidence supporting the hypothesis that gamified flipped classrooms can significantly enhance the acquisition of past tenses among Iranian EFL learners compared to non-gamified flipped classrooms. The findings underscore the potential of integrating gamification into educational strategies, particularly within the flipped classroom model, to foster a more engaging and effective learning environment. This integration not only aligns with contemporary educational theories emphasizing learner engagement and motivation but also demonstrates practical benefits in the realm of language acquisition.

The success of the gamified flipped classroom approach can be attributed to its ability to cater to learners' psychological needs for autonomy, competence, and relatedness, as outlined by Self-Determination Theory proposed by Deci and Ryan (2000). By providing a structured yet flexible learning environment where students can progress at their own pace, feel competent through achieving game-related goals, and connect with peers through collaborative activities, the gamified flipped classroom apparently increased students' intrinsic motivation. This motivation appears to have translated into more effective learning outcomes, as evidenced by the improved performance in past tense acquisition.

Additionally, the element of competition and rewards inherent in gamification can further incentivize students to actively participate and strive for mastery. This combination of autonomy, competence, and relatedness within a gamified flipped classroom setting creates a motivating and fulfilling learning experience that can lead to improved academic performance and overall satisfaction with the learning process. Ultimately, by tapping into these psychological needs, educators can create a more effective and enjoyable learning environment that fosters student success.

It is important to acknowledge that while gamification and flipped classrooms offer promising avenues for enhancing educational outcomes, their effectiveness might vary across different educational contexts and learner profiles. The success of these methods depends heavily on the design of the gamified elements and the quality of the pre-class content, which must be engaging and pedagogically sound. Furthermore, the technological infrastructure and support available to students can influence the feasibility and success of implementing such approaches. This study's findings contribute to the broader discourse on educational technology and pedagogy by illustrating how traditional teaching methods can be augmented with innovative practices to meet the evolving needs of learners. The gamified flipped classroom model not only challenges educators to rethink how content is delivered but also encourages the creation of learning environments that are inherently motivating and conducive to deep learning.

Indeed, this approach not only enhances engagement and motivation but also allows for a more personalized and adaptive learning experience. Moreover, by leveraging the power of gamification, educators can tap into learners' natural inclination towards games and competition, creating a more dynamic and interactive learning environment. As such, the findings of this study have broad implications for the design of effective and engaging learning experiences across a range of educational contexts.

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