Effectiveness of a Gamified Scaffold-to-Autonomy Framework for Teaching English Tenses in an EFL School Context

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Abstract

This study examines the effectiveness of the Gamified Scaffold-to-Autonomy Framework (GSAF) in improving secondary-school learners' mastery and retention of English present tense forms in resource-constrained English as a Foreign Language (EFL) classroom. In many such contexts, traditional grammar instruction often leads to short-term learning with limited retention, making it difficult for learners to apply grammatical knowledge in meaningful communication. Addressing this challenge is important for both teachers and learners, as ineffective grammar instruction can hinder language development and require repeated reteaching. To address this issue, the study proposes an integrated instructional approach that combines inductive grammar learning, structured cognitive scaffolding, low-tech gamified activities, and a systematic reduction of instructional support to promote learner autonomy. A quasi-experimental design was used, involving 68 Grade 9 students divided into a GSAF group (n = 32) and a conventional Present–Practice–Produce (PPP) group (n = 36). Learners were assessed through pre-test, immediate post-test, and delayed post-test measures to evaluate both learning outcomes and retention over time. The findings indicate that while both groups showed improvement, the GSAF group achieved higher immediate post-test scores and demonstrated stronger retention after two weeks. The results suggest that combining scaffolded support with gamified retrieval opportunities helps learners internalize grammatical structures more effectively and sustain their learning over time. Beyond the immediate classroom context, this study highlights the potential of structured scaffold fading and low-tech gamification as practical and scalable strategies for grammar instruction in low-resource educational settings. The findings have important implications for curriculum design and teacher practice, particularly in promoting long-term language development and learner autonomy.

Keywords: scaffold fading; learner autonomy; gamified instruction; grammar pedagogy; EFL secondary education; tense acquisition

1. Introduction

Grammar is widely recognized as a central component of second-language proficiency, as it enables learners to communicate accurately and effectively across a range of contexts (Larsen-Freeman, 2015). In English as a Foreign Language (EFL) classroom, particularly at the secondary-school level, grammatical competence plays an important role in supporting both written and spoken communication. However, learners often have trouble applying grammatical forms accurately in meaningful contexts and may struggle to retain learned grammatical structures over time (Nassaji & Fotos, 2004; DeKeyser, 2003).

These challenges are particularly evident in resource-constrained EFL settings, where exposure to English outside the classroom is limited and learning depends largely on formal instruction. Traditional approaches to grammar teaching, such as rule-based explanation followed by controlled practice, may support initial understanding but often appear to result in mechanical use of forms with limited transfer to independent language use (Harmer, 2007). Consequently, learners may find it difficult to internalize grammatical structures in a way that supports sustained and flexible application.

This issue has important implications for both learners and teachers. Limited retention can restrict learners' ability to use grammatical forms effectively in real communication, while for teachers, it may lead to repeated reteaching and reduced instructional efficiency. In classrooms with limited resources, the need for effective and sustainable instructional strategies becomes particularly important.

Recent developments in language pedagogy suggest that inductive learning, instructional scaffolding, and game-based activities may support deeper engagement and improved learning outcomes. Inductive approaches encourage learners to identify patterns and construct grammatical understanding from contextualized input (Ellis, 2002; Nassaji & Fotos, 2004). Scaffolding, grounded in the concept of the Zone of Proximal Development, provides structured support that enables learners to perform tasks beyond their current ability. As this support is gradually withdrawn, learners may develop the capacity to perform independently. (Vygotsky, 1978).

In addition, gamified activities can enhance motivation, participation, and opportunities for repeated practice (Deterding et al., 2011; Hamari et al., 2014). From a cognitive perspective, such activities may promote repeated retrieval, which appears to support memory

consolidation and longer-term retention.

However, these approaches have largely been examined independently, and their combined potential within a unified instructional framework remains underexplored. While scaffolding theory emphasizes the gradual reduction of instructional support, the process of scaffold fading is often discussed conceptually, with limited empirical operationalization in classroom contexts (Wood, Bruner, & Ross, 1976). As a result, learners may remain dependent on external support and may not fully develop the ability to use grammatical forms autonomously.

Addressing this gap is important, as the absence of structured support reduction may limit learners' progression from assisted performance to independent language use. There is therefore a need for an instructional approach that integrates inductive learning, structured cognitive support, and engaging practice within a systematically staged framework that promotes learner autonomy, particularly in resource-constrained EFL contexts where practical and scalable teaching strategies are required.

The present study aims to examine whether the Gamified Scaffold-to-Autonomy Framework (GSAF), which integrates inductive noticing, structured scaffolding, low-tech gamified practice, and systematic scaffold fading, can enhance both immediate learning outcomes and retention of English present tense forms among secondary-school learners.

Background of the Study

In many English as a Foreign Language (EFL) context particularly in government school settings in India, learners have limited exposure to English outside the classroom. As a result, formal instruction becomes the primary means through which learners develop grammatical competence. This places considerable responsibility on classroom teaching to support not only understanding but also effective use of language.

In practice, however, grammar instruction in such settings often relies heavily on traditional rule-based approaches, typically following a Presentation–Practice–Production sequence (Harmer, 2007). While this approach may help learners grasp grammatical forms at a basic level, it does not always lead to meaningful application or sustained learning. Learners may complete structured exercises successfully but still struggle to use grammatical forms independently in real communicative situations.

These challenges are further shaped by classroom conditions such as large class sizes, limited instructional time, and restricted access to technological resources. Such constraints may reduce opportunities for individualized feedback, interactive engagement, and repeated practice, all of which are important for developing grammatical accuracy and fluency. As a result, learning often remains confined to task completion rather than progressing toward independent language use.

Although alternative instructional approaches have been discussed in language education, their practical implementation in resource-constrained classrooms remains limited. Teaching practices in such contexts often prioritize syllabus completion over deeper learning, which may restrict learners' opportunities to develop sustained understanding and independent control of grammatical structures.

Given these conditions, it becomes important to consider instructional approaches that are both effective and feasible within such environments. Approaches that can support active engagement, provide structured guidance, and promote sustained learning without reliance on advanced resources are especially relevant for secondary-school EFL classrooms.

Statement of the Problem

Although grammar instruction remains an important component of English language education, many secondary school learners, particularly those in government school contexts, continue to find it difficult to use English tense forms accurately and consistently in everyday communication. Deductive approaches, such as rule explanation followed by controlled practice, may support short-term understanding; however, they often appear to lead to limited retention and reduced ability to use language independently in real contexts. In contrast, inductive instruction may encourage deeper conceptual understanding, but without sufficient guidance it may place excessive cognitive demands on learners, especially those with limited exposure to English.

Research suggests that gamified activities can enhance motivation, engagement, and opportunities for practice. Importantly, such activities may also support retrieval processes that contribute to improved retention over time. However, these strategies are not consistently integrated into structured grammar instruction and are often used as isolated activities rather than as part of a coherent learning sequence.

Similarly, while scaffolding theory emphasizes the gradual reduction of instructional support, relatively few studies have demonstrated how this process can be implemented in clearly defined stages within classroom grammar teaching. The shift from supported learning to independent use is often discussed at a conceptual level but is less frequently translated into structured classroom practice.

Taken together, these issues highlight the need for an instructional approach that integrates inductive learning, structured support, and meaningful practice within a coherent and systematic framework. The present study addresses this need by examining the Gamified Scaffold-to-Autonomy Framework (GSAF) and its potential to improve both immediate learning outcomes and retention of English tense forms among secondary school learners in resource-constrained EFL contexts.

Purpose of the Study

The purpose of this study is to examine the effectiveness of the Gamified Scaffold-to-Autonomy Framework (GSAF) in improving secondary school learners' mastery and retention of English present tense forms. Specifically, the study compares the GSAF with the conventional Present–Practice–Produce (PPP) approach to determine whether a scaffold-to-autonomy instructional model can produce

better learning outcomes in a resource-constrained EFL context. The framework integrates inductive noticing, structured scaffolding, low-tech gamified practice, and a staged reduction of instructional support to facilitate the transition from guided learning to independent language use.

The study focuses on three key outcomes: (a) immediate learning gains following instruction, (b) retention of tense knowledge over time, and (c) differences in learning progression between learners taught through scaffold-to-autonomy instruction and those receiving deductive instruction.

Objectives

1. To compare the immediate learning outcomes of the Gamified Scaffold-to-Autonomy Framework (GSAF) and the deductive Present–Practice–Produce (PPP) method in teaching English present tense forms.
2. To examine whether learners instructed through the GSAF demonstrate stronger retention of tense knowledge than those taught through the PPP method two weeks after the intervention.
3. To analyse the progression of learners' scores within each instructional group across three assessment points: pre-test, immediate post-test, and delayed post-test.
4. To compare retention loss between the GSAF and PPP groups by analysing score differences between immediate and delayed post-tests.

Research Questions

1. Does instruction through the GSAF result in higher immediate post-test performance than instruction through the PPP method?
2. Do learners taught through the GSAF demonstrate stronger retention of tense knowledge than those taught through the PPP method two weeks after instruction?
3. How do learners' scores change across the pre-test, immediate post-test, and delayed post-test within each instructional group?
4. Is there a significant difference in retention loss between the GSAF and PPP groups as measured by score decline from immediate to delayed post-test?

2. Theoretical Framework

The Gamified Scaffold-to-Autonomy Framework (GSAF) is grounded in three complementary theoretical perspectives that collectively inform its design: Cognitive Load Theory, Scaffolding Theory, and Gamification Theory. Together, these perspectives explain why integrating structured instructional support with low-tech gamified activities can enhance tense learning in secondary school classrooms.

1. Cognitive Load Theory

Cognitive Load Theory (Sweller, 1988; van Merriënboer et al., 2024) proposes that learners' working memory is limited; therefore, instructional design must minimise unnecessary processing demands. Tense structures involve multiple interacting elements such as subject–verb agreement, auxiliary forms, and morphological changes, which can overload learners, particularly in early stages of acquisition.

In the present study, the GSAF addresses this challenge through targeted cognitive supports. Visual scaffolds, colour-coded verb cues, simplified model sentences, and structured prompts are used to draw attention to essential grammatical features while limiting extraneous information. These supports enable learners to notice patterns without being overwhelmed. By reducing cognitive load during rule inference, the framework prepares learners for progressively more independent application of tense forms.

2. Scaffolding Theory

Scaffolding Theory, informed by Vygotsky's (1978) concept of the Zone of Proximal Development, emphasises that learners benefit from temporary instructional support that enables them to perform tasks beyond their current independent ability. Within the GSAF, scaffolding functions as a structured bridge between guided noticing and autonomous production.

The framework incorporates multiple forms of scaffolding, including visual highlighting of critical grammatical elements, model sentences, collaborative peer interaction, and immediate corrective feedback. As learners gain confidence and accuracy, these supports are gradually withdrawn. This planned fading strengthens internalization and promotes independent grammatical performance. In this sense, scaffolding serves not only as assistance but also as a mechanism for transitioning from supported learning to self-regulated mastery.

3. Gamification Theory

Gamification Theory (Deterding et al., 2011; Hamari et al., 2014) highlights how elements such as challenge, reward, unpredictability, and collaboration can enhance engagement and persistence in learning environments. In resource-constrained classrooms, digital gamification may not be feasible; therefore, the GSAF incorporates low-tech gamified activities that require learners to manipulate and apply tense forms actively.

Timed rounds, movement-based tasks, and team challenges encourage repeated retrieval and active participation. These activities reduce anxiety associated with rule-heavy grammar instruction and promote sustained engagement. When combined with cognitive scaffolds and inductive noticing tasks, gamified elements contribute to a learning environment that is both structured and motivating.

4. Scaffold Fading: From Assisted Performance to Autonomous Production

Scaffolding theory underscores the importance of gradually reducing instructional support as learners develop independence (Vygotsky, 1978; Wood, Bruner, & Ross, 1976). Although this principle is widely acknowledged, many studies describe scaffold fading conceptually without clearly operationalizing how support is systematically withdrawn within classroom practice. The transition from assisted performance to autonomous production often remains theoretical rather than procedurally defined.

The present study addresses this gap by embedding scaffold fading within a structured sequence of instructional stages. In the GSAF, the reduction of support is intentional and progressive, with each stage increasing learner responsibility.

The first stage involves pattern identification, where subjects and auxiliary verbs are visually highlighted in model sentences. Guided noticing prompts encourage learners to compare forms and identify subject–verb agreement patterns (e.g., "was" with singular subjects and "were" with plural subjects). At this stage, cognitive load is reduced and attention is externally guided.

In the second stage, visual highlighting is removed while model sentences remain visible. Learners engage in controlled rule-application tasks, such as selecting or completing appropriate verb forms. Structural support remains available, but learners must rely more actively on their understanding.

The third stage focuses on guided construction, where learners combine subject and verb prompts to produce complete sentences using previously observed patterns. Responsibility increasingly shifts toward the learner.

In the final stage, all visual cues and model sentences are withdrawn. Learners produce sentences independently, relying on internalized grammatical representations. At this point, regulation shifts from teacher-supported performance to learner-controlled production.

By systematically staging the reduction of instructional support, the GSAF provides a structured approach to implementing scaffold fading in a deliberate and observable manner within grammar instruction. This gradual transition is expected to support deeper grammatical internalization and facilitate movement toward autonomous language use.

The structured stages of scaffold fading implemented in the GSAF are summarized in Table 1.

Table 1. Stages of Scaffold Fading in the Gamified Scaffold-to-Autonomy Framework (GSAF)

Stage	Instructional Support	Learner Task	Cognitive Demand	Mode of Regulation
Stage 1: Pattern Identification	Subjects and verbs highlighted in model sentences	Identify and compare agreement patterns	Recognition and noticing	Teacher-guided
Stage 2: Controlled Application	Highlighting removed; model sentences visible	Select or complete appropriate verb forms	Retrieval and rule application	Shared
Stage 3: Guided Construction	Structural model available; subject and verb prompts provided	Construct sentences using prompts	Generative processing	Transitional
Stage 4: Autonomous Production	All visual cues and models removed	Produce complete sentences independently	Internalized retrieval	Learner regulated

As shown in Table 1, instructional support decreases progressively across four stages, while learner responsibility and cognitive demand increase correspondingly. The sequence reflects a structured progression from teacher-guided recognition to independent grammatical production, thereby operationalizing the scaffold-to-autonomy transition central to the GSAF model.

3. Literature Review

Research on grammar instruction highlights three key strands that inform the development of the Gamified Scaffold-to-Autonomy Framework (GSAF): inductive learning, game-based learning, and instructional scaffolding. Together, these strands support an approach that combines conceptual understanding, meaningful practice, and gradual movement toward independent language use.

1. Inductive Learning and Grammar Acquisition

Inductive instruction is widely recognized for supporting deeper conceptual understanding and learner autonomy. When learners infer grammatical rules from contextualized examples, they engage in active noticing and hypothesis formation, which are important for meaningful grammar learning (Ben ẗez-Correa et al., 2019; Rod Ellis, 1985; Mallia, 2014). This approach encourages learners to actively process language rather than passively receive rules.

However, the effectiveness of inductive learning depends on the level of instructional support provided. Research in cognitive psychology suggests that minimally guided discovery can place a high cognitive load on learners, particularly those with limited prior knowledge (Kirschner, Sweller, & Clark, 2006). Without appropriate guidance, learners may struggle to form accurate grammatical generalizations. These findings indicate that inductive learning is most effective when supported by structured instructional guidance.

At the same time, inductive approaches primarily support rule discovery and understanding and may not, on their own, ensure sustained practice or independent application in language use.

2. Game-Based Learning and Engagement

A substantial body of research supports the role of game-based learning in enhancing motivation, engagement, and participation in language classrooms. Reviews by Behnamnia et al. (2024) and Matore and Sulaiman (2023) indicate that game-based environments promote collaboration, problem-solving, and sustained involvement in learning tasks.

In EFL contexts, gamified activities can make grammar practice more meaningful and interactive (Cabrera-Solano, 2022; Singaravelu, 2008). Importantly, low-tech physical games are particularly suitable for resource-constrained classrooms, as they encourage active participation without reliance on digital tools.

From a cognitive perspective, gamified activities can support retrieval practice by requiring learners to actively recall and apply grammatical forms during tasks. Such repeated retrieval strengthens memory consolidation and improves long-term retention of grammatical structures (Roediger & Karpicke, 2006).
In this way, gamification complements inductive learning by providing opportunities for repeated practice and retrieval, helping to reinforce what learners have understood.

3. Scaffolding and Scaffold Fading in Grammar Instruction

Instructional scaffolding plays an important role in supporting learners as they apply grammatical knowledge. Strategies such as guided modelling, visual cues, prompts, and feedback can assist learners in understanding and using grammatical structures more accurately (Nassaji & Fotos, 2004).

A key principle of scaffolding is the gradual reduction of support as learners become more competent (Hammond, 2001; Vygotsky, 1978). This process allows learners to move from supported performance toward independent language use. However, while scaffold fading is widely discussed in theory, it is less often clearly structured and implemented in classroom practice, particularly in grammar instruction.

Unlike inductive learning and gamified practice, scaffolding specifically addresses the transition from guided performance to independent language use through the systematic reduction of instructional support.

Research Gap

Although substantial research supports inductive learning, game-based instruction, and scaffolding, these approaches have largely been examined in isolation. Existing studies tend to focus on rule discovery, engagement through gamification, or instructional support mechanisms separately, with limited attention to how these elements can be integrated within a unified instructional framework.

Moreover, while scaffold fading is widely recognized as a central principle of scaffolding theory, relatively few empirical studies have operationalized the transition from assisted performance to autonomous production through clearly defined and staged instructional procedures. As a result, there is limited evidence on how structured support reduction can be systematically designed, implemented, and evaluated within grammar classrooms.

In addition, research examining such integrated approaches in rural government school contexts in India remains limited. Learners in these settings often have restricted exposure to English and limited access to technological resources, which increases the need for low-tech, pedagogically grounded instructional models that are feasible in such environments.

The present study addresses these theoretical and contextual gaps by proposing and empirically evaluating the Gamified Scaffold-to-Autonomy Framework (GSAF), which integrates inductive rule discovery, structured scaffolding, low-tech gamified practice, and staged reduction of instructional support to enhance tense mastery and retention.

4. Methodology

Research Design

This study employed a quasi-experimental design to examine the effectiveness of the Gamified Scaffold-to-Autonomy Framework (GSAF) in comparison with the conventional deductive Present–Practice–Produce (PPP) method for teaching English Present tense forms. Learner performance was measured at three-time points pre-test, immediate post-test, and delayed post-test to assess both immediate learning gains and short-term retention. The ten-day instructional intervention was implemented within the regular classroom schedule, ensuring equal instructional exposure across groups while maintaining ecological validity. A mixed-design ANOVA was conducted to examine within-group and between-group differences across assessment points. Ethical approval was obtained from the participating institutions, and informed consent was secured from all students and school authorities prior to data collection.

Participants

The participants comprised 68 Grade 9 students drawn from two government secondary schools in a southern Indian context. **A** purposive sampling approach was used to select the schools from a larger pool, based on comparable baseline English performance and similar socio-educational characteristics. Within the selected schools, a convenience sampling approach was employed, whereby all students from the selected Grade 9 classroom sections were included in the study. Existing classroom groups were used without altering their composition, as reorganizing students was not feasible within the school's administrative and scheduling structure.

Of the total sample, 36 students were assigned to the PPP group and 32 students to the GSAF group. Group assignment was based on existing classroom sections, with efforts made to ensure baseline comparability between groups prior to the intervention. All participants followed the same state curriculum and had limited exposure to English outside the classroom, making formal instruction the primary source

of grammatical input.

Instructional Procedure

Both groups received instruction on four English present tense forms over a structured ten-day intervention period. Each group received equivalent instructional time to ensure comparability of treatment exposure.

The PPP group was taught using the traditional Presentation–Practice–Production approach. Instruction involved explicit explanation of grammatical rules, followed by controlled written exercises and guided production tasks.

The GSAF group received instruction through a staged scaffold-to-autonomy sequence. The instructional design integrated:

- Inductive noticing tasks using contextualized model sentences,
- Structured cognitive scaffolds such as colour-coded verb cues and prompt cards, and
- Low-tech gamified practice activities, including timed challenges and collaborative tasks.

Within each stage, a range of classroom tasks was implemented to operationalize the scaffold-to-autonomy sequence. These tasks included picture-based classification activities, structured completion exercises, guided sentence construction tasks, and independent written production. Although individual activities varied, they were systematically aligned with the level of instructional support assigned to each stage. Visual cues, model sentences, and structural prompts were progressively reduced across sessions to increase learner responsibility. Low-tech gamified elements such as timed challenges and collaborative scoring were embedded throughout the intervention to sustain engagement and encourage repeated retrieval. Importantly, the defining feature of the treatment was not the specific activities themselves but the deliberate and staged reduction of instructional support over the ten-day instructional cycle.

Instruments and Assessment

All participants completed a pre-test before instruction, an immediate post-test at the conclusion of the ten-day intervention, and a delayed post-test administered two weeks later to assess retention.

Each assessment consisted exclusively of written components designed to evaluate learners' understanding and application of English present tense forms. The test included a combination of objective items and productive tasks. Objective items comprised multiple-choice questions, fill-in-the-blank exercises, match the following, sentence transformation, sentence formation using verbs and error identification tasks, which measured recognition and controlled application of tense structures.

In addition, a picture-based sentence construction task was included to assess learners' ability to apply target tense forms in contextualized situations. Students were required to observe visual prompts and produce grammatically accurate sentences corresponding to the depicted actions or routines. This component was intended to evaluate contextualized written production beyond discrete-item recognition.

All responses were scored using a predetermined answer key. Each correct response was awarded one point, and total scores were calculated for statistical analysis. Parallel test formats were used across the three assessment points to ensure consistency while minimizing practice effects.

Validity and Reliability of the Instrument

The achievement test was constructed in alignment with the Grade 9 English curriculum and specifically targeted four present tense forms. Content validity was established through expert review by two experienced English language educators, who evaluated the clarity, appropriateness, and alignment of test items with instructional objectives. Necessary revisions were made based on their feedback.

To enhance measurement consistency, parallel test formats were administered across the pre-test, immediate post-test, and delayed post-test phases. Each test followed an identical structural blueprint, including objective items and guided sentence construction tasks, ensuring comparability across assessment points.

All items were scored using a standardized marking scheme in which each correct response was awarded one mark. The use of objective scoring criteria minimized subjectivity and ensured consistency in evaluation.

Reliability of the test was assessed using Cronbach's alpha (α), which yielded a coefficient of $\alpha = 0.85$, indicating good internal consistency of the instrument.

Data Analysis

Data were analysed using SPSS. Descriptive statistics were computed to summarise learner performance across assessment points. A mixed-design ANOVA was conducted to examine the effects of instructional method (GSAF vs. PPP) and time (pre-test, immediate post-test, delayed post-test).

Prior to conducting the mixed-design ANOVA, assumptions of normality were examined using the Shapiro–Wilk test. Pre-test scores for both the PPP and GSAF groups were normally distributed ($p > .05$). Therefore, parametric analyses were deemed appropriate.

Mauchly's Test of Sphericity was applied to verify statistical assumptions, and Greenhouse–Geisser corrections were used where violations occurred. In addition to overall learning gains, retention loss was examined by comparing score differences between immediate and delayed post-test measures to evaluate the stability of learning over time.

To control for potential extraneous variables, both groups followed the same curriculum content, received instruction over an equivalent duration, and were assessed using identical instruments and procedures. In addition, baseline comparability between groups was established through pre-test scores, ensuring that differences observed could be more confidently attributed to the instructional intervention rather than pre-existing differences.

5. Results

The results are presented in relation to the four research questions, focusing on (a) immediate learning outcomes, (b) long-term retention, (c) learning progression across assessment points, and (d) retention loss between instructional approaches.

Immediate Learning Outcomes

Table 2. Descriptive Statistics

Group	Test	Mean (M)	Standard Deviation (SD)
PPP Group	Pre-test	18.08	2.80
	Immediate post-test	21.94	4.23
GSAF Group	Pre-test	18.13	3.66
	Immediate post-test	24.66	4.52

Table 2 presents descriptive statistics for the PPP and GSAF groups in the pre-test and immediate post-test. Both groups demonstrated improvement following instruction; however, the GSAF group achieved greater gains. The GSAF group's mean score increased from M = 18.13 (SD = 3.66) at pre-test to M = 24.66 (SD = 4.52) at immediate post-test. In comparison, the PPP group improved from M = 18.08 (SD = 2.80) to M = 21.94 (SD = 4.23). This indicates that while both instructional approaches were effective, the GSAF approach resulted in greater immediate learning gains.

Table 3. Mixed-Design ANOVA Results (Pre-Test to Immediate Post-Test)

Effect	F	df	Sig (p-value)	Partial η^2
Time	247.32	1,66	<0.001	0.79
Group	2.49	1,66	.12	0.04
Time × Group	16.33	1,66	<0.001	0.20

The mixed-design ANOVA revealed a significant main effect of time, $F(1, 66) = 247.32$, $p < .001$, $\eta^2 = .79$, indicating substantial overall improvement across groups. This suggests that instruction had a strong positive impact on learners' understanding of tense forms. The main effect of instructional method was not statistically significant, $F(1, 66) = 2.49$, $p = .12$, $\eta^2 = .04$. This indicates that when considered independently of time, overall performance between groups did not differ significantly. Importantly, a significant time × group interaction emerged, $F(1, 66) = 16.33$, $p < .001$, $\eta^2 = .20$. This indicates that the rate of improvement differed between groups, with the GSAF group showing greater gains compared to the PPP group over time.

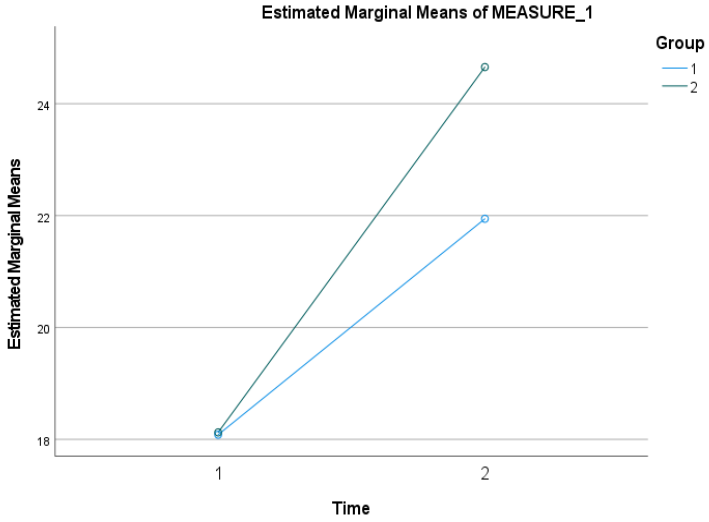

Figure 1. Estimated Marginal Average of Tenses Scores Across Pre-test and Immediate Post-test

Figure 2 illustrates the estimated marginal means across the pre-test and immediate post-test. Both groups show an upward trend; however, the GSAF group exhibits a steeper increase. This visual pattern further supports the statistical finding that GSAF led to stronger immediate learning outcomes.

Long-term Learning Outcomes

Table 4. Descriptive Statistics

Group	Test	Mean (M)	Standard Deviation (SD)
PPP Group	Pre-test	18.08	2.80
	Delayed post- test	19.19	4.53
GSAF Group	Pre- test	18.13	3.66
	Delayed post-test	23.09	4.63

Table 4 presents performance at pre-test and delayed post-test administered two weeks after instruction. The GSAF group improved from M = 18.13 (SD = 3.66) to M = 23.09 (SD = 4.63), whereas the PPP group increased from M = 18.08 (SD = 2.80) to M = 19.19 (SD = 4.53). This indicates that although both groups retained learning, the GSAF group demonstrated substantially stronger retention over time.

Table 5. Mixed-Design ANOVA Results (Pre-Test to Delayed Post-Test)

Effect	F	df	Sig (p-value)	Partial η^2
Time	65.97	1, 66	<0.001	0.50
Group	4.94	1, 66	.03	0.07
Time × Group	26.56	1, 66	<0.001	0.29

The analysis indicated a significant main effect of time, $F(1, 66) = 65.97$, $p < .001$, $\eta^2 = .50$, and a significant main effect of instructional method, $F(1, 66) = 4.94$, $p = .03$, $\eta^2 = .07$. This suggests that learning gains were maintained over time and that the type of instructional method influenced retention outcomes. The time × group interaction was also significant, $F(1, 66) = 26.56$, $p < .001$, $\eta^2 = .29$. This confirms that the GSAF group maintained significantly stronger retention compared to the PPP group.

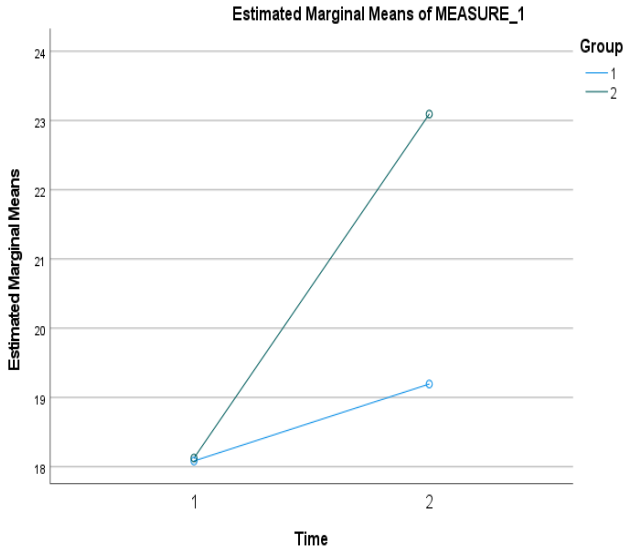

Figure 2. Estimated Marginal Average of Tenses Scores Across Pre-test and Delayed Post-test

Figure 2 displays the estimated marginal means across the pre-test and delayed post-test. While both groups show improvement, the GSAF group demonstrates a greater sustained gain. This suggests that the learning achieved through GSAF was more stable over time.

Learning Progression Across Assessment Points

Table 6. Descriptive statistics

Group	Test	Mean (M)	Standard Deviation (SD)
PPP Group	Pre-test	18.08	2.80
	Immediate post-test	21.94	4.23
	Delayed post-test	19.19	4.59
GSAF Group	Pre-test	18.13	3.66
	Immediate post-test	24.66	4.52
	Delayed post-test	23.09	4.63

Table 6 summarizes score progression across pre-test, immediate post-test, and delayed post-test for both groups.

Table 7. Mauchly's Test of Sphericity

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	0.51	44.37	2	<0.001	0.67	0.69	0.50

Mauchly's Test of Sphericity indicated a violation of the sphericity assumption, W = .51, χ^2 (2) = 44.37, p < .001. Accordingly, Greenhouse–Geisser corrections (ε = .67) were applied in subsequent analyses. This adjustment ensured the accuracy and validity of the repeated-measures analysis.

Table 8. Mixed-Design ANOVA Across Three Time Points

Effect	F	df	Sig (p-value)	Partial η^2
Time	146.37	1.34, 88.31	<0.001	0.69
Group	5.66	1, 66	.02	0.08
Time × Group	20.96	1.34, 88.31	<0.001	0.24

The mixed-design ANOVA revealed a significant main effect of time, F (1.34, 88.31) = 146.37, p < .001, η^2 = .69. This indicates substantial overall learning progression across the three assessment points. A significant main effect of instructional method was also observed, F (1, 66) = 5.66, p < .02, η^2 = .08. This suggests that the type of instruction influenced overall performance across time. Furthermore, a significant time × group interaction emerged, F (1.34, 88.31) = 20.96, p < .001, η^2 = .24. This suggests that the two groups followed different learning trajectories, with the GSAF group showing stronger improvement and better retention over time.

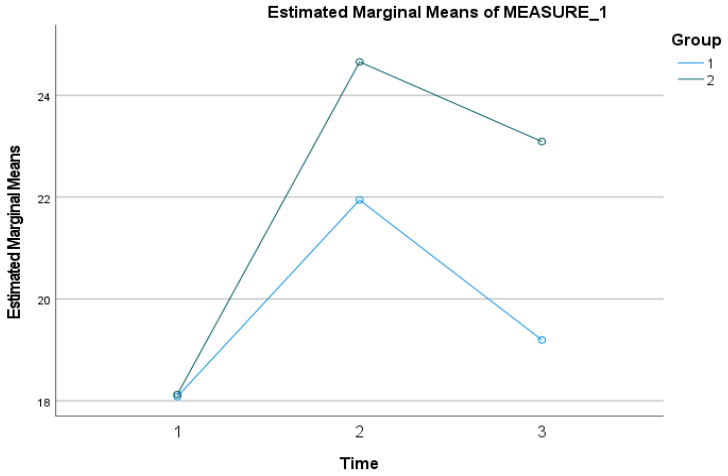

Figure 3. Estimated Marginal Average of Tenses Scores Across all assessment Times for Deductive and Inductive Groups

Figure 3 illustrates these trajectories. Both groups improved from pre-test to immediate post-test; however, the GSAF group showed greater gains and a smaller decline at delayed post-test relative to the PPP group. This pattern indicates that learning in the GSAF group was both more effective.

Retention Loss Comparison Between Deductive and Inductive Methods

Table 9: Comparison of Retention Loss Between Groups

Methods	Mean (M)	Std. deviation	t	df	p-value
PPP	2.75	1.90	8.67	35	<0.001
GSAF	1.56	0.50	17.54	31	<0.001

Paired-samples t-tests revealed significant retention loss in both groups. The GSAF group showed a mean decline of 1.56 points, t (31) = 17.54, p < .001, whereas the PPP group demonstrated a larger decline of 2.75 points, t (35) = 8.67, p < .001. The difference in mean decline indicates that the PPP group experienced a greater reduction in scores between the immediate and delayed post-test compared to the GSAF group. This pattern suggests relatively smaller retention loss in the GSAF group.

6. Discussion

The present study investigated the effectiveness of the Gamified Scaffold-to-Autonomy Framework (GSAF) in comparison with the conventional Present–Practice–Produce (PPP) approach for teaching English Present tense forms to secondary-school EFL learners. Across immediate achievement, delayed retention, overall progression, and retention loss, the findings consistently favoured the GSAF model. These results provide empirical support for integrating inductive learning, structured scaffold fading, and low-tech gamified practice within grammar instruction, particularly in resource-constrained educational contexts.

The significantly higher immediate post-test performance observed in the GSAF group suggests that inductive noticing tasks, when supported by structured cognitive scaffolds, facilitate deeper initial processing of grammatical forms. This finding aligns with Schmidt's (1990, 2001) Noticing Hypothesis, which emphasizes the central role of conscious attention in language acquisition. By visually

highlighting subject–verb relationships and guiding learners through pattern comparison tasks, the framework encouraged active engagement with form–meaning connections rather than passive rule memorization. Previous studies have similarly indicated that inductive grammar instruction can promote stronger grammatical awareness and short-term gains than purely deductive approaches (Ellis, 2002; Nassaji & Fotos, 2004).

The inclusion of low-tech gamified activities may also have contributed to enhanced immediate performance. Timed challenges, collaborative tasks, and movement-based exercises likely increased learner engagement while reducing the anxiety often associated with rule-heavy grammar instruction. These findings are consistent with research demonstrating that gamification can positively influence motivation, participation, and short-term achievement in language learning contexts (Deterding et al., 2011; Su & Cheng, 2015). Importantly, the gamified elements in this study were embedded within a structured instructional sequence rather than functioning as isolated motivational tools. From a cognitive perspective, these activities may also have supported retrieval practice by requiring learners to repeatedly recall and apply grammatical forms during tasks, thereby strengthening memory consolidation and facilitating retention.

More striking, however, were the long-term retention outcomes. The GSAF group not only outperformed the PPP group on the delayed post-test but also exhibited a smaller decline between immediate and delayed assessments. This pattern suggests that the gradual reduction of instructional support played a critical role in strengthening grammatical internalization. While scaffolding theory emphasizes the importance of fading assistance as learners gain competence (Wood, Bruner, & Ross, 1976; van de Pol et al., 2010), empirical demonstrations of how this fading can be systematically implemented within grammar instruction remain limited. The staged progression from highlighted pattern recognition to autonomous sentence production appears to have supported the development of independent grammatical control.

This progression may also reflect a shift from supported performance to proceduralized knowledge, where repeated use and reduced reliance on external cues enable more automatic language processing.

The analysis across three assessment points further reinforces this interpretation. Although both groups improved following instruction, the PPP group demonstrated a sharper decline over time, whereas the GSAF group retained a greater proportion of its gains. These findings echo earlier research suggesting that deductive instruction may yield rapid comprehension but comparatively weaker long-term retention (Erlam, 2003; Lyster, 2007). In contrast, instructional approaches requiring learners to actively construct and retrieve grammatical rules tend to promote more durable learning (DeKeyser, 2003; Norris & Ortega, 2000).

The smaller retention loss observed in the GSAF group may be attributed to the structured transition from assisted performance to autonomous production. As visual cues and prompts were progressively withdrawn, learners were required to rely increasingly on internally constructed grammatical representations. Such systematic fading likely encouraged proceduralizing and repeated retrieval, both of which are known to strengthen long-term memory consolidation (Roediger & Karpicke, 2006; Hulstijn, 2002).

Taken together, the findings suggest that the effectiveness of the GSAF lies not merely in gamification or inductive learning as isolated strategies, but in the deliberate sequencing of scaffold reduction within a motivating instructional environment. The integration of guided noticing, structured cognitive support, and systematic fading appears to create conditions conducive to both immediate understanding and sustained grammatical control. In secondary-school EFL classrooms, particularly those operating with limited technological resources, such a scaffold-to-autonomy model offers a pedagogically grounded and practically feasible alternative to traditional rule-based instruction.

7. Limitations of the Study

Despite these findings, several limitations should be acknowledged. First, the study employed a convenience sampling approach within a specific educational context, which may limit the generalizability of the results to other learner populations. Second, the use of intact classroom groups in a quasi-experimental design means that complete randomization was not possible, and therefore some uncontrolled variables may have influenced the outcomes. Third, the duration of the intervention and follow-up period was relatively short, which may not fully capture long-term retention effects. Finally, the study focused on a specific grammatical domain (present tense forms), and further research is needed to determine whether similar effects can be observed across other linguistic structures.

8. Conclusion

The present study demonstrated that the Gamified Scaffold-to-Autonomy Framework (GSAF) represents an effective instructional approach for teaching English present tense forms to secondary-level EFL learners. Across all measured dimensions, including immediate learning gains, long-term retention, learning progression, and retention loss, learners instructed through the GSAF consistently outperformed those taught through the conventional Present–Practice–Produce (PPP) method. These findings provide empirical support for the integration of inductive learning, structured scaffold fading, and low-tech gamified practice in grammar instruction.

Beyond immediate achievement, the results highlight the importance of systematically reducing instructional support to promote learner autonomy. The staged transition from visually guided pattern recognition to independent sentence production appears to facilitate deeper internalization of grammatical structures. By operationalizing scaffold fading at a micro-instructional level, this study extends existing theoretical discussions of scaffolding and demonstrates how the movement from assisted performance to autonomous production can be deliberately designed and empirically examined within classroom grammar instruction.

The findings also carry important pedagogical implications. Encouraging learners to notice patterns and infer rules supports active engagement with grammatical form and meaning. Structured cognitive supports, when gradually withdrawn, may reduce cognitive overload

while fostering independent control of language structures. Furthermore, low-tech gamified activities can enhance motivation and provide repeated retrieval opportunities without reliance on digital infrastructure. Together, these elements suggest that grammar instruction can be both cognitively structured and engaging, even in resource-constrained educational settings.

While the findings are promising, they should be interpreted with consideration of contextual and methodological limitations, particularly in relation to sample size and study duration.

Future research should examine the application of the GSAF model across different grammatical targets and educational contexts. Longitudinal investigations could explore the long-term developmental impact of scaffold-to-autonomy instructional sequencing. Further studies may also consider learner-related variables such as proficiency level, motivation, and cognitive differences, which are known to influence grammar acquisition.

In conclusion, this study contributes to the growing body of research supporting learner-centered and scaffolded approaches to grammar pedagogy. By integrating inductive noticing, structured cognitive support, and systematic scaffold fading within a gamified instructional environment, the GSAF offers a pedagogically grounded and practically feasible model for promoting both grammatical mastery and learner autonomy in secondary-school EFL classrooms.

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