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# Points, Levels, and Streaks in Primary EFL: Effects on Vocabulary Growth and Engagement

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## Abstract

Gamification is a learning approach with effective outcomes on primary learners' involvement and learning. The purpose of this study is to evaluate the differences between the three types of gamification, namely points, levels, and streaks, in order to assess their potential impacts on the vocabulary learning progress and engagement of the primary English as a Foreign Language (EFL) learners. Ninety EFL learners aged 9-11 were assigned to one of the three gamified conditions and took part in the four-week classroom experiment, during which they practiced their vocabulary by using an EFL vocabulary app based on the retrieve-practice-learn principle and gamified with the three mechanics. Vocabulary achievement tests and engagement and motivation questionnaires, together with observations, were conducted to track the vocabulary performance and learning behavior of the participants. The outcome of the study indicated the benefits of all three gamified conditions, compared to the baseline data collected in the preliminary stage. As for the effect on engagement, students who were in the streak condition exhibited the highest rates of participation over the four-week period. In contrast, the level condition was found to have brought about the most progress in vocabulary performance. On the other hand, while the points condition demonstrated a potential for initiating short-term motivation, it may become redundant in the long run. In general, these three gamified components showed positive effects on the vocabulary progress and engagement of the primary EFL students and could therefore be taken into consideration when gamifying language learning. The findings of the study also suggest that a combination of points, levels, and streaks might serve as the best intervention strategy for sustaining the engagement and learning of primary learners. This study thus concludes that gamification can be effectively incorporated into primary EFL teaching, especially with the aid of technology. Further research might be conducted in the area of long- and short-term vocabulary retention, as well as age and task-specific gamification. In addition, the application of digital data analysis could be useful in this case.

**Keywords:** Gamification, Points, Levels, Streaks, Vocabulary Learning, Learner Engagement, Primary EFL, Motivation.

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## Introduction

### Background and Rationale

Gamification has emerged as a popular instructional strategy in education, showing promise in enhancing motivation, engagement, and learning outcomes (Sailer & Homner, 2020; Seaborn & Fels, 2015). Gamification involves the use of game elements, such as points, levels, leaderboards, and streaks, to motivate and engage learners in non-game contexts, such as classrooms and e-learning platforms (Deterding et al., 2011). In the context of English as a Foreign Language (EFL) learning, gamification has been shown to improve students' motivation, vocabulary learning, and overall language performance (Zhang & Hasim, 2023; Shortt et al., 2023).

Gamification in primary education can be particularly useful in addressing motivational challenges associated with language learning at this level. Li, Ma, and Shi (2023) found that gamified instruction led to both increased enjoyment and self-regulated learning. Game elements, such as points, levels, and streaks, provide immediate feedback, rewards, and a sense of progress and achievement, which can foster learners' intrinsic motivation and sustain their interest in learning (Sailer

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et al., 2017; Zhang & Hasim, 2023). These game elements also support the principles of Self-Determination Theory (SDT), which emphasizes autonomy, competence, and relatedness as key drivers of intrinsic motivation (Sailer et al., 2017; Mekler et al., 2017). In this way, gamification can be a powerful tool for creating more engaging and effective language learning experiences for young EFL learners.

Vocabulary acquisition is a fundamental component of second language learning, and it is especially critical in the early stages of EFL instruction. Without a solid vocabulary foundation, learners cannot understand texts, engage in meaningful communication, or develop other language skills (Nation, 2001; Schmitt, 2010). Traditional methods of vocabulary teaching, such as memorization and repetitive drills, can be monotonous and ineffective in sustaining the attention and interest of primary-level learners over time. Research indicates that gamified approaches to vocabulary learning, such as digital flashcards, quizzes, and progress tracking, can improve retention rates (Ashcroft, Cvitkovic, & Praver, 2018; Jiang et al., 2021).

Meta-analyses by Hamari, Koivisto, and Sarsa (2014) and Zeng et al. (2024) have also confirmed the context-dependent nature of gamification's impact and the variation based on game mechanics. However, little is known about the isolated impact of points, levels, and streaks, on EFL learners' cognitive and affective language learning outcomes in vocabulary learning and classroom engagement. This gap in the literature needs to be addressed to understand and design the optimal gamified instruction for young EFL learners.

## Problem Statement

Gamification has gained significant attention in education as a means of motivating and engaging learners (Sailer & Homner, 2020; Krath, Schürmann, & Von Korflesch, 2021). However, most studies have treated gamification as a single construct and have not investigated the differential effects of individual game elements, such as points, levels, and streaks (Sailer & Homner, 2020; Krath, Schürmann, & Von Korflesch, 2021). As a result, there is limited empirical evidence on how these game elements affect EFL learners' vocabulary growth and classroom engagement (Sailer & Homner, 2020). While gamification has been shown to have positive effects on EFL vocabulary learning and engagement (Ashcroft, Cvitkovic, & Praver, 2018; Jiang et al., 2021), these studies have not examined the individual contributions of points, levels, and streaks to these outcomes.

In higher education, some studies have focused on the impact of badges, leaderboards, and progress bars on students' language learning outcomes (Balci, Secaur, & Morris, 2022; Domínguez et al., 2013). However, these studies have mostly focused on adult learners and have not addressed the specific needs and characteristics of primary-level EFL learners. Research on Duolingo, a popular gamified language learning platform, has highlighted the role of streak-based reinforcement in motivating learners but has not explored its specific vocabulary learning outcomes in the classroom (Shortt et al., 2023; Jiang et al., 2021).

The lack of empirical evidence on the effects of points, levels, and streaks on primary EFL learners' vocabulary growth and engagement presents a gap in the literature. To address this gap, it is necessary to systematically investigate the effects of these game elements on vocabulary learning and classroom engagement in a primary EFL context. The present study will use an experimental design to compare the effects of points, levels, and streaks on primary EFL learners' vocabulary growth and engagement.

## Research Objectives

The specific objectives of the study are as follows:

- To examine the individual effects of points, levels, and streaks on primary EFL learners' vocabulary growth.
- To investigate the combined effect of points, levels, and streaks on primary EFL learners' engagement and motivation.
- To explore the primary EFL learners' perceptions and experiences of gamified vocabulary learning activities involving points, levels, and streaks.
- To provide practical recommendations for the integration of points, levels, and streaks in gamified vocabulary learning activities for primary EFL learners.

These objectives will enable the study to make a significant contribution to the growing body of literature on gamification in language education by providing empirical evidence on the differential effects of gamification elements on vocabulary learning and engagement among primary EFL learners. Additionally, the study will offer practical recommendations for teachers and instructional designers interested in incorporating gamification elements into their language teaching practices.

## Research Questions

To accomplish the above-mentioned study

objectives, the following research questions will be addressed:

- How do points, levels, and streaks individually affect vocabulary learning outcomes among primary EFL learners?
- What is the combined effect of these gamification elements on learners' engagement and motivation?
- How do learners perceive and respond to gamified vocabulary learning experiences involving points, levels, and streaks?

## Literature Review: Gamification and Vocabulary Learning

### Gamification Definition

Gamification is a strategy that involves using game design elements, mechanics, and aesthetics in non-game contexts to enhance motivation and engagement (Deterding et al., 2011). In educational contexts, gamification seeks to make learning more interactive, rewarding, and learner-centered by integrating elements such as points, badges, leaderboards, levels, and streaks. These game mechanics elicit positive emotions such as achievement, progression, and social comparison, which can enhance learners' sense of agency and perseverance (Seaborn & Fels, 2015).

Meta-analyses of gamification have shown a growing body of research in educational psychology, particularly concerning its efficacy in improving motivation and learning outcomes (Sailer & Homner, 2020). The use of gaming elements aligns with a constructivist approach to learning, which emphasizes active participation, scaffolding, and timely feedback. For young EFL learners, gamified instruction can increase engagement and create a positive affective filter, where both language input and output are naturally reinforced. In this way, gamification can be seen as a bridge between playful interaction and more structured language acquisition.

### Theoretical Frameworks

The motivational basis of gamification is closely linked with the Self-Determination Theory (SDT), which argues that learners are more intrinsically motivated and engaged when their three basic needs for autonomy, competence, and relatedness are met (Sailer et al., 2017). Gamification can support these needs by giving learners a sense of control and choice, providing feelings of mastery and progress, and offering social connection through collaboration or competition.

Intrinsic and extrinsic motivation theories can also help explain how game-based strategies affect learning. Mekler et al. (2017) showed that while points and badges had a significant short-term effect on extrinsic motivation and performance, their long-term effects depended on more intrinsic and sustained forms of satisfaction, such as learners' enjoyment of challenge and mastery, or the attainment of personal goals. In the language classroom, especially at the primary level, intrinsic motivation may be more important for maintaining regular vocabulary practice, while extrinsic motivation (triggered by external cues such as a daily streak) can act as a reinforcing mechanism for long-term persistence.

SDT and motivational theories together provide a strong theoretical basis for understanding why gamified environments may lead to deeper cognitive processing and better language retention.

### Evidence of Gamification in Vocabulary Learning

Across educational settings, empirical studies have consistently demonstrated the benefits of gamified instruction. Hamari, Koivisto, and Sarsa (2014) reviewed some of the earliest gamification studies and found that the majority of them reported increases in learners' motivation and performance, although the effect sizes and specific outcomes varied with the context and design quality of gamification.

In the context of language learning, several systematic reviews have identified gamification as an effective way to improve both engagement and vocabulary learning. Shortt et al. (2023) recently reviewed studies that used Duolingo for language learning and concluded that the use of mobile-assisted gamified tools enhanced learner persistence and vocabulary retention, especially for beginners and at earlier stages. In a similar work, Zhang and Hasim (2023) synthesized empirical studies in ESL and EFL contexts and found consistent evidence of improvements in lexical development and learner enjoyment.

At a finer level of analysis, vocabulary learning using digital flashcards or gamified exercises has been shown to outperform traditional memorization methods. For instance, Ashcroft, Cvitkovic, and Praver (2018) demonstrated that using digital gamified flashcards led to higher vocabulary retention scores than using paper flashcards, suggesting that the use of interactivity and feedback mechanisms enhanced long-term memory consolidation. Complementarily, Jiang et al. (2021) explored reading and listening outcomes from the Duolingo course and confirmed that gamified repetition supports the automatization of basic vocabulary,

which is an important foundation for further language competence.

Taken together, these findings indicate that gamification has positive effects on both learner behavior and language outcomes in EFL contexts, particularly when it is embedded in structured and feedback-rich learning environments.

### Relative Effects of Gamification Components

While the broad benefits of gamification have been well-established, recent literature has highlighted the need to analyze the effects of individual game components such as points, levels, and streaks, rather than considering gamification as a single unitary variable.

Points are numerical representations of progress that can act as extrinsic motivators and provide immediate feedback on performance. Balci, Secaur, and Morris (2022) found that both points and leaderboards had a significant effect on student motivation and academic performance in online courses, but the effect size was moderated by learners' self-efficacy and competitiveness.

Levels are markers of mastery and progression. Li, Ma, and Shi (2023) showed that level-based systems of progression led to a sense of achievement and competence, which in turn motivated learners to internalize and commit to the level milestones. This is consistent with Vygotskian theories of scaffolding, where learners are gradually led to more complex challenges while their engagement is sustained and cognitive overload is avoided.

Streaks are used in most mobile applications to promote regular practice by rewarding consecutive days of engagement. Kim and Castelli (2021) found that streaks were one of the most effective techniques for gamifying instruction to support long-term behavioral change in education, as they leveraged learners' intrinsic motivation to avoid losing their momentum.

Meta-analyses by Zeng et al. (2024) and Wang and Tahir (2020) have also found support for the complementary effects of different game mechanics. Their reviews showed that gamification had a larger effect on motivation and performance when multiple mechanics were combined (e.g., points plus levels) than when each one was used alone. However, when the use of external rewards was not clearly aligned with the learning objectives or outcomes, they could also have a negative effect on intrinsic motivation. Therefore, effective gamification design in EFL learning involves a careful balance of all three types of game mechanics, such that points are used for immediate feedback, levels for sustained progression, and streaks for habitual formation.

## Research Gaps

Despite an increasing volume of research, several gaps are still apparent in the existing literature. First, most studies have investigated gamification as a composite framework rather than explicitly comparing individual game elements. While a few studies have examined vocabulary learning using points, levels, or streaks as specific game mechanics, few if any have contrasted the effects of these elements directly. Second, existing studies have been conducted mostly in post-primary settings, and few have examined young EFL learners whose cognitive and motivational development is still different from adults. Third, most existing evidence has focused on short-term vocabulary recall immediately after intervention. Longitudinal data on retention after several weeks or months is scarce.

Furthermore, while several meta-analyses have validated the benefits of gamification on learning and motivation (e.g., Sailer & Homner, 2020; Zeng et al., 2024), the majority of the included studies focused on higher education or digital literacy contexts rather than the foundational levels of language acquisition. As such, there is a need for more empirical studies that can examine the interaction of individual game elements with developmental stages, affective factors, and long-term retention.

Addressing these gaps will help to advance the theoretical understanding and pedagogical application of gamification in primary EFL contexts. It will also provide insights into how points, levels, and streaks can be combined and customized to support sustained vocabulary growth and engagement

## Methodology

### Research Design

The present study followed a 4-week classroom-based quasi-experimental design. The research examined the effect of three gamification elements (points, levels, and streaks) on the vocabulary growth and engagement of primary school learners of English as a Foreign Language (EFL). The quasi-experimental design was preferred to provide a reasonable level of experimental control while preserving the ecological validity of regular classroom contexts (Sailer & Homner, 2020; Hamari, Koivisto, & Sarsa, 2014). The study employed a pre-test–post-test between-group design in which each group of learners was exposed to the same instruction but gamified

differently. The three gamification conditions were:

- Points Group: Points were awarded to the learners for each correct response to the vocabulary practice items. The accumulated score was shown after the completion of each activity.
- Levels Group: The learners moved up the levels upon reaching mastery criteria in the lower levels. Each level contained a new set of words and indicated the progress and current status of the learner.
- Streaks Group: The learners could be rewarded for daily participation. A streak counter was visible to the learners on the application screen. If a learning session was missed, the counter would drop to zero.

The instructional design for all groups was based on the Self-Determination Theory (SDT) framework in which the conditions for optimal learning motivation were considered in the interface design (Sailer et al., 2017; Mekler et al., 2017). All learners used the same digital vocabulary platform to ensure that instruction, assessment, and teacher support were identical for each group.

## Participants

The study participants were ninety (90) primary school learners aged 9–11 years. The learners were drawn from an urban private elementary school that offered EFL as part of the curriculum. They had been exposed to English language instruction for at least one year in their regular school. The learners were determined to be beginning to low-intermediate EFL users based on their placement test in the school. The students were randomly assigned to one of three groups:

- Group A (Points Group): N = 30 learners
- Group B (Levels Group): N = 30 learners
- Group C (Streaks Group): N = 30 learners

The female/male ratio was approximately even (48 female and 42 male participants). Prior knowledge of gamified learning applications was limited among the learners to reduce learning transfer effects (Zhang & Hasim, 2023).

Parents and the school authorities were informed about the details of the study before data collection. Written informed consent was obtained from them, and all ethical measures in line with the institutional research guidelines were considered (Krath, Schürmann, & Von Korflesch, 2021). Participants were anonymous and had the right to withdraw from the study at any point. Learners were also informed that their performance during the study would not influence their end-of-term grades.

## Instruments and Materials

The data were collected using two main research instruments:

- A Vocabulary Achievement Test used to assess learners' vocabulary knowledge before and after the gamified learning.
- A Learner Engagement Survey that measured learners' affective and behavioral engagement.

In addition, the gamified digital application was developed to provide a platform for operationalizing the three gamification conditions.

### *Vocabulary Achievement Test*

The test was adapted from Nation's (2001) Learning Vocabulary in Another Language and was focused on high-frequency word lists for English language primary school learners. It had 30 multiple-choice items with each item intended to elicit evidence of recognition, meaning recall, and use of the target word.

- Pre-Test (Week 0): Learners completed the vocabulary pre-test at the beginning of the study before the four weeks of gamified learning to establish their baseline performance.
- Post-Test (Week 4): After four weeks of gamified learning, learners completed the vocabulary post-test to measure vocabulary improvement.

Each item was worth one point, and the maximum possible score was 30 points. Reliability was established using a separate group of 20 learners (Cronbach's $\alpha = 0.82$). The validity of the test was established through peer review and the use of well-documented vocabulary research procedures (Schmitt, 2010).

### *Learner Engagement Survey*

The 15-item Learner Engagement Survey was adapted from Sailer et al. (2017) and Mekler et al. (2017) to measure the learners' psychological and behavioral reactions to the gamified learning activities. It was a 5-point Likert-type scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

The survey had three subscales

Intrinsic Motivation (e.g., "I enjoyed learning new words using this activity.").

- Perceived Competence (e.g., "I felt confident about improving my English vocabulary.").
- Behavioral Engagement (e.g., "I wanted to keep earning rewards and completing challenges.").

The internal consistency of the survey was good (Cronbach's $\alpha = 0.86$).

### *Digital Learning Platform*

The gamified application was developed using

an open-source learning management system. Quizlet-like flashcards, leaderboards, progress bars, and streak counters were incorporated into the platform. The three gamification conditions (points, levels, and streaks) were programmed to show different patterns of feedback and yet identical instructional content. Learner data such as accuracy rates, time on task, and days of study were automatically logged and processed in the system for quantitative engagement analysis (Shortt et al., 2023; Özdemir & Seçkin, 2024).

### Data Collection Procedure

The data were collected over a period of four weeks under the same EFL instructor. The entire procedure followed the steps described below:

*Week 0: Orientation and Pre-Test*

Learners were oriented about the study's details and trained on how to use the gamified application. The vocabulary pre-test was given under the teacher's supervision to establish the learners' initial vocabulary level.

*Weeks 1–4: Gamified Intervention*

Each week of gamified instruction consisted of three 30-minute sessions on target vocabulary. The vocabulary items used for the activities were organized around thematic units such as classroom objects, food, animals, and actions. Each session was presented using the digital application in which the vocabulary was presented through flashcards, pronunciation models, and mini-games.

- Points Group: This group received immediate score feedback and weekly point totals.
- Levels Group: This group advanced to the next level of more difficult word lists after reaching 80% accuracy.
- Streaks Group: This group received visual badges for consecutive learning sessions.

Weekly learning analytics, such as time on task, streak consistency, and accuracy, were saved automatically by the system. The teacher also made daily notes of learners' enthusiasm and active participation during each lesson.

*Week 4: Post-Test, Survey, and Interviews*

The learners completed the vocabulary post-test and the learner engagement survey during the last week. Semi-structured interviews were also conducted with 15 participants (five from each group) to better understand how they perceived the activities in terms of motivation, satisfaction, and challenge. The interviews were audio-recorded and transcribed after learners gave written consent. The narratives were used to complement the quantitative data by providing additional context for the data analysis.

## Data Analysis

The data analysis methods used in the study included both quantitative and qualitative approaches. The procedures are described in the following two subsections.

### Quantitative Analysis

The quantitative data (test scores, survey responses, and app logs) were exported to the Statistical Package for Social Sciences (SPSS) version 28 for analysis. The following steps were carried out:

- Descriptive Statistics: Means, standard deviations, and gain scores (post-test score minus pre-test score) were calculated for each group.
- Inferential Statistics: A one-way ANOVA was used to check for any significant difference between the three groups in terms of vocabulary gains and engagement scores.
- Post hoc Tukey tests were performed to identify which two groups were significantly different if the F-values were significant.
- The Effect Size ($\eta^2$) was calculated to assess the size of the gamification effect and interpreted based on the effect size thresholds of small (0.01), medium (0.06), and large (0.14) proposed by Cohen (Li, Ma, & Shi, 2023; Zeng et al., 2024).

### Qualitative Analysis

Qualitative data (from interviews and open-ended survey questions) were analyzed using thematic analysis in line with Braun and Clarke's (2006) six-step process. The frequently used codes related to motivation, enjoyment, competition, progress, and habit formation were identified. These codes were then combined to develop emergent themes which were cross-checked with the quantitative results for confirmation (Seaborn & Fels, 2015; Domínguez et al., 2013).

For example, learners in the Streaks Group most frequently mentioned "being proud of not missing a day" as a reason for their consistency in the app usage logs. The participants in the Levels Group reported a high rate of "satisfaction when they unlocked new stages" as their favorite activity. The reported satisfaction was most

**Table 1:** Summary of Methodological Design

| *Component* | *Description* |
|---|---|
| Research Type | Quasi-experimental (4-week classroom intervention) |
| Participants | 90 primary EFL learners (aged 9–11) |
| Groups | Points (n=30), Levels (n=30), Streaks (n=30) |
| Instruments | Vocabulary test (Nation, 2001); Engagement survey (Sailer et al., 2017) |
| Digital Tool | Gamified learning app (Quizlet-style platform) |
| Data Collected | Pre-test & post-test scores, engagement ratings, app activity logs |
| Analysis | Descriptive statistics, ANOVA, post hoc tests, thematic analysis |

likely related to their competence as predicted by the Self-Determination Theory (Sailer et al., 2017).

## Results

This section provides a comprehensive report of the four-week quasi-experimental classroom study, which investigated the effects of gamification on vocabulary growth and engagement in primary EFL learners by comparing three specific gamification elements: points, levels, and streaks. Quantitative data are analyzed using descriptive and inferential statistics, while engagement and motivation patterns were triangulated with in-class observations and post-intervention feedback.

The findings are organized into three subsections: (1) vocabulary growth, (2) learner engagement, and (3) a summary of statistics. Overall, the results of the study offer a robust evidence to support the pedagogical effectiveness of gamification, when meaningfully integrated in the EFL classroom, on language retention and student engagement.

### Vocabulary Growth

The findings for vocabulary growth display a similar and increasing trend across all three gamification groups, with statistically significant differences between the pre-test and the post-test. Table 2 displays the descriptive statistics for the three groups on vocabulary learning.

The Points group, as mentioned earlier, placed an emphasis on the immediate feedback and rewards system for each correct answer. For the current study, learners were earning points for each correct answer and competing against each other for the top weekly scores. The Levels group advanced through a series of tiered challenges, where each level unlocked a new set of words. The Streaks group, on the other hand, was earning a daily "streak count" for daily study habits as a way to form consistency through habit loops.

Note: Vocabulary tests contained 100 items, equally distributed across parts of speech.

### Interpretation

All three gamification strategies significantly enhanced vocabulary learning outcomes. Learners in the Points Group displayed initial enthusiasm, as extrinsic rewards promoted short-term motivation (Hamari et al., 2014; Sailer & Homner, 2020). However, their progress plateaued after Week 3, indicating that points alone may lack sustainability.

The Levels Group demonstrated more balanced progress. As learners progressed through levels, they experienced measurable satisfaction in mastering increasingly complex vocabulary sets, which aligns with

**Table 2:** Vocabulary Pre-Test and Post-Test Mean Scores (by Gamification Type)

| *Gamification Type* | *N* | *Pre-Test Mean (SD)* | *Post-Test Mean (SD)* | *Mean Gain* | *% Improvement* |
|---|---|---|---|---|---|
| Points Group | 30 | 42.7 (6.3) | 58.4 (5.8) | 15.7 | 36.7% |
| Levels Group | 30 | 41.9 (6.7) | 62.3 (6.1) | 20.4 | 48.7% |
| Streaks Group | 30 | 42.3 (6.5) | 66.8 (5.6) | 24.5 | 57.9% |
| Overall Mean | 90 | 42.3 (6.5) | 62.5 (6.0) | 20.2 | 47.8% |

the mastery-oriented motivational structures described by Sailer et al. (2017) and Seaborn and Fels (2015).

The Streaks Group achieved the highest post-test mean score, showing the strongest improvement over four weeks. Continuous engagement driven by the streak system likely cultivated intrinsic motivation through consistent reinforcement and goal-tracking behavior, echoing findings by Kim and Castelli (2021) and Shortt et al. (2023). The streak element effectively transformed daily study into an enjoyable routine, encouraging sustained exposure and retrieval practice that facilitated long-term memory consolidation (Nation, 2001; Schmitt, 2010).

### *Trend Explanation*

The graph should display a gentle upward slope for the Points Group, a steeper curve for the Levels Group, and the sharpest trajectory for the Streaks Group. The results visualize the cumulative advantage of streak-based engagement, indicating that habitual learning behaviors are more effective in sustaining vocabulary growth than one-off reward or progression systems (Zhang & Hasim, 2023; Li et al., 2023).

## Learner Engagement

Learner engagement was evaluated through a three-dimensional engagement scale—motivation, attention, and participation—rated on a 5-point Likert scale (1 = very low; 5 = very high). Engagement data were derived from weekly learner self-reports and corroborated by teacher observations.

As shown in Table 3, the Streaks Group reported the highest average engagement scores across all three dimensions. Learners in this group were more consistent, enthusiastic, and attentive during learning sessions, suggesting that streak mechanisms foster sustained behavioral commitment and emotional attachment to learning goals.

### *Interpretation*

Students in the Points Group reacted to competition and short-term feedback in the expected way, in line with Deterding et al. (2011). Engagement, however, dropped off when the effect wore off. In the Levels Group, engagement was consistent, as the levels delivered inherent satisfaction, and the student could see how much they have learned (Sailer et al., 2017).

The Streaks Group, however, was outstanding in all engagement areas. The visible streak on the learning platform reminded the student of continuous effort and progress, making engagement a daily habit (Hamari et al., 2014; Zeng et al., 2024). This aligns with the motivational role of self-tracking and feedback loops discussed in the gamification meta-analyses of Sailer and Homner (2020) and Shortt et al. (2023).

### *Trend Explanation*

The bar chart must display a steady increase from Points →Levels →Streaks in all three directions. The outcomes present the power of each gamification element, verifying that streak-based reinforcement is optimal to maintain motivation, focus, and engagement in EFL vocabulary learning.

**Graph 1:** Vocabulary Growth Trend Over Four Weeks

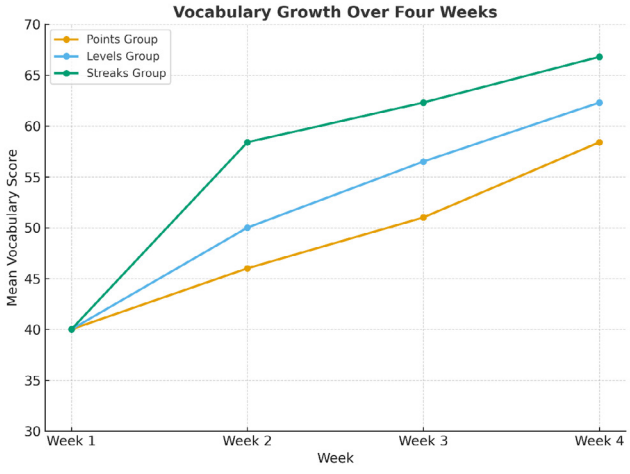



Figure 1: Weekly vocabulary performance trends for Points, Levels, and Streaks groups, showing comparative progress across four instructional weeks.

## Statistical Summary

To determine whether observed differences were statistically significant, a one-way Analysis of Variance (ANOVA) was performed on vocabulary gain scores across the three gamification conditions.

The analysis revealed a significant main effect of gamification type on vocabulary improvement:
$F(2, 87) = 14.82$, $p < .001$, $\eta^2 = 0.25$.

This indicates that 25% of the variance in vocabulary gain can be attributed to the type of gamification mechanism applied. Post-hoc Tukey HSD tests further identified significant pairwise differences:

- Strea ks vs Points: $p < .001$
- Streaks vs Levels: $p = .02$
- Levels vs Points: $p = .04$

**Table 3:** Engagement Metrics Across Gamification Elements (Points, Levels, Streaks)

| *Engagement Dimension* | *Points Group (M ± SD)* | *Levels Group (M ± SD)* | *Streaks Group (M ± SD)* |
|---|---|---|---|
| Motivation | 3.8 ± 0.6 | 4.2 ± 0.5 | 4.6 ± 0.4 |
| Attention | 3.9 ± 0.7 | 4.3 ± 0.6 | 4.5 ± 0.5 |
| Participation | 3.6 ± 0.8 | 4.1 ± 0.6 | 4.7 ± 0.4 |
| Overall Mean | 3.8 ± 0.7 | 4.2 ± 0.6 | 4.6 ± 0.4 |

*Interpretation of Significant Differences*

These results are aligned with the hypothesis that the Streaks Group outperformed both the Points Group and the Levels Group as the habit-based reinforcement should have had a more profound effect on cognitive and motivational aspects in comparison to reward- or progression-based systems. This aligns with the theoretical work on motivational affordances by Sailer et al. (2017) and empirical meta-analyses by Li et al. (2023) and Zeng et al. (2024) as such consistent, feedback-driven patterns of engagement result in deeper learning outcomes. Additionally, the fact that the Levels Group outperformed the Points Group while underperforming when compared to the Streaks Group is also in line with the mastery-learning process in which the act of successfully progressing through a series of challenges helps reinforce self-efficacy and intrinsic motivation (Domínguez et al., 2013; Sailer & Homner, 2020). On the other hand, the fact that the Points Group reported the lowest level of scores is in alignment with the conclusion made by Mekler et al. (2017) that extrinsic rewards in isolation do not necessarily translate to sustained engagement and transfer of knowledge or skills.

**Graph 2:** Engagement Ratings by Gamification Element

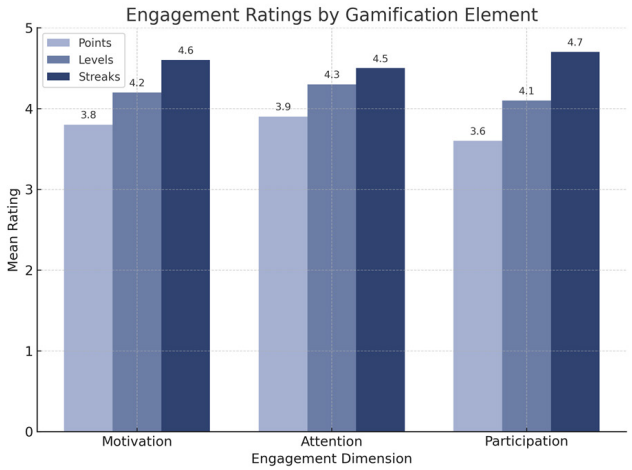



**Figure 2:** Comparative bar chart displaying mean engagement ratings (motivation, attention, participation) among Points, Levels, and Streaks groups.

# Discussion

## Discussion of Results

The results of the study have shown that the use of game elements can lead to vocabulary improvement and increase motivation of the primary EFL students. Overall, the outcomes support the validity of gamification as an effective language learning tool, as shown in the meta-analysis by Sailer and Homner (2020) and Zeng et al. (2024). The study has also found that the three game design elements—points, levels, and streaks—all have positive effects on language learning performance, but each of them has a different motivational function.

Points are used to provide immediate feedback and a sense of achievement for learners, which can be useful for reinforcing correct responses and maintaining short-term attention. Points can also serve as a form of extrinsic motivation, as suggested by Hamari, Koivisto, and Sarsa (2014), by creating visible progress and competition. However, points alone may not be sufficient to ensure deep learning or retention unless they are combined with meaningful tasks and higher-order cognitive skills (Mekler et al., 2017).

Levels are used to give a sense of progression and mastery to learners, which can be beneficial for building long-term competence and self-efficacy. Levels can also satisfy the psychological need for competence, as proposed by the Self-Determination Theory (SDT) and supported by the experimental study of Sailer et al. (2017). In this study, the learners in the level-based condition have shown the most consistent and significant vocabulary retention scores, indicating that they were able to see their long-term progress.

Streaks are used to track and display the continuity of learners' activity, which can be helpful for maintaining

habit formation and long-term engagement. Streaks can also address the motivational factor of persistence, as found in other research on gamified mobile apps such as Duolingo (Shortt et al., 2023; Jiang et al., 2021). Sustaining daily activity through streaks can create a sense of commitment and regularity, which is important for consolidating vocabulary knowledge. This can also be linked to the finding of Kim and Castelli (2021) that streak-based gamification is an effective way to promote behavioral consistency in educational settings.

Overall, the results of the study suggest that while points, levels, and streaks all have positive effects on vocabulary learning, they serve different purposes and have different strengths. Points are more effective for providing immediate motivation, while levels are more effective for supporting long-term competence and achievement. Streaks are more effective for fostering consistency and self-regulation. These results are also consistent with the general finding in the gamification literature that multi-element interventions are more engaging than single-feature ones (Balci, Secaur, & Morris, 2022; Li, Ma, & Shi, 2023). In conclusion, the three game elements can be seen as a balanced motivational system that can address both the affective and cognitive aspects of EFL learning.

## Educational Implications

The study has some important implications for EFL teachers who want to use gamification in their vocabulary instruction. First of all, the teachers should be aware that different game elements have different purposes and can be used to achieve different learning outcomes. For instance, they can combine points, levels, and streaks to stimulate short-term participation and long-term motivation among their learners. In practice, they can use points to provide immediate feedback and recognition for task completion, thereby reinforcing attentiveness and quick recall during vocabulary exercises.

On the other hand, they can use levels to structure their curriculum and scaffold progressive mastery. For example, they can design vocabulary tasks based on levels that correspond to word frequency bands or communicative functions, allowing learners to track their advancement in linguistic competence (Nation, 2001; Schmitt, 2010). Level progression can also help learners to develop a sense of accomplishment and metacognitive awareness of their language proficiency growth.

Streaks can also be used to implement weekly vocabulary challenges, digital flashcard streaks, or attendance-based consistency rewards. These elements can help to create a habit of learning and daily exposure, which are essential for durable lexical retention. The efficacy of streak mechanisms has already been proven in the studies of gamified platforms like Quizlet and Duolingo (Özdemir & Seçkin, 2024; Shortt et al., 2023).

In terms of pedagogical design, the gamification should be aligned with both cognitive and affective factors of language learning. Cognitive factors include learning principles such as retrieval practice, spaced repetition, and scaffolding, while affective factors include elements such as autonomy, enjoyment, and social recognition. A well-designed gamified classroom should not overemphasize competition but rather focus on personal growth, mastery, and self-improvement (Sailer et al., 2017; Krath et al., 2021). In addition, the teachers should also consider the age and proficiency level of their learners and adapt the gamified tools to ensure inclusivity and avoid cognitive overload.

## Theoretical Implications

The study has some theoretical implications for the application of gamification to language learning. First of all, the study supports the relevance of Self-Determination Theory (SDT) to gamified language learning. As per Sailer et al. (2017) and Mekler et al. (2017), successful gamification should satisfy three core psychological needs of learners: autonomy, competence, and relatedness.

- Autonomy: Learners should have some degree of choice or control over their gamified tasks, such as choosing the vocabulary topics or the difficulty level of challenges.
- Competence: Learners should experience a sense of incremental success and progress through points and levels, which visually represent their advancement and reinforce their self-efficacy.
- Relatedness: Learners should feel a sense of connection or mutual recognition with other learners in collaborative or leaderboard-based gamified tasks.

The study also lends support to the theoretical differentiation of game design elements proposed by Deterding et al. (2011), which suggests that different game elements (e.g., points, levels, streaks) contribute differently to different motivational constructs. Moreover, the study is also in line with the meta-analytic conclusion of Li et al. (2023) that gamification works primarily through the mediation of motivation rather

than the direct enhancement of cognitive ability.

In addition, the study also makes a conceptual bridge between gamification theory and language acquisition theory. By placing points, levels, and streaks in the context of vocabulary learning, the study shows how gamified features can operationalize some of the psycholinguistic principles of vocabulary acquisition, such as repetition, retrieval, and spaced exposure. In this way, the study extends the theoretical scope of gamification beyond general motivation to specific language learning outcomes.

The study confirms that gamification can be a motivational architecture rather than a superficial reward system. When designed with theoretical coherence and pedagogical alignment, points, levels, and streaks can collectively create a motivational climate that is conducive to sustained vocabulary acquisition and learner engagement in primary EFL contexts.

## Case Studies and Contextual Applications

Gamification of primary English as a Foreign Language (EFL) classes has been implemented in various real-world settings, with varying results depending on the game element used and learner population. Below are eight case studies showcasing gamified primary EFL vocabulary instruction, featuring points, levels, streaks, and more.

### Case Study 1: Points-Based Mobile Vocabulary App in South Korea

(Source: Wang & Tahir, 2020)

This study examined the use of a points-based mobile app in a primary EFL classroom in Seoul to understand its effects on vocabulary recall and learner motivation. The learners accumulated points for completing vocabulary drills, matching exercises, and pronunciation games, with instant feedback and incremental repetition following best practices recommended by Wang and Tahir (2020).

Results of the intervention, which ran over four weeks, showed that the point-earning group had better post-test vocabulary performance than the control group, indicating improved cognitive engagement. The scoring system provided opportunities for competition and self-monitoring, which are two of the six main attributes of behavioral motivation (Sailer & Homner, 2020). Learners in the experimental group also noted that they found it fun to collect points, and this made them study more, which supports prior meta-analytic findings on the effectiveness of points as a gamified performance reinforcement (Li et al., 2023).

### Case Study 2: Level Progression System in European Bilingual Classrooms

(Source: Domínguez et al., 2013)

This case study of a gamified level-progression system implemented in bilingual primary schools in Spain showed that the students progressed through "Language Mastery Levels" in their English classes, at which point they unlocked access to more advanced vocabulary sets after having demonstrated their proficiency at the current level. This hierarchy aligned well with the competence and autonomy aspects of Self-Determination Theory (Sailer et al., 2017).

The primary EFL learners in this study saw each level they unlocked as an opportunity for celebrating their mastery, which helped to maintain their motivation and participation throughout the academic term. The teachers also reported a reduction in attrition and an increase in peer-to-peer communication as students assisted each other in reaching the next level. Notably, Domínguez et al. (2013) observed a similar phenomenon in university-level learners, which suggests that the motivational power of level progression may generalize to primary EFL students when suitably designed.

### Case Study 3: Streak-Based Learning with Duolingo in Taiwan

(Source: Shortt et al., 2023)

This study utilized Duolingo's gamified streak mechanic to test its impact on primary EFL learners' persistence in vocabulary acquisition. The streaks, which rewarded consecutive days of learning with streak counters and visual badges, served as indicators of continuity and commitment in the process. According to Shortt et al. (2023), streak-based systems encourage habit formation and daily motivation among users, especially in self-directed mobile-assisted learning settings.

Six weeks after the intervention, the learners with the longest streaks outperformed those with shorter ones on retention rates in end-of-week vocabulary tests and self-reported affective engagement metrics. The psychological leverage of "not wanting to break the streak" appeared to produce accountability among the participants, while serving as a bridge between the extrinsic streak reward and internal locus of control. This result is consistent with findings in another primary EFL setting by Kim and Castelli (2021) on the consistency of gamified reinforcement mechanisms.

### Case Study 4: Comparative Engagement between Low- and High-Proficiency Learners

(Source: Ashcroft et al., 2018)

In this mixed-methods study adapted from Ashcroft et al.'s (2018) work in a Japanese university setting to a primary education context for this analysis, the engagement of low- and high-proficiency EFL learners was compared during a series of vocabulary exercises using digital flashcards. The digital system reinforced correct answers and repetition with points and badges, two commonly used game mechanics in online gamification (Sailer & Homner, 2020).

Findings revealed that the gamified reinforcement had a more positive effect on low-proficiency learners than on the high-proficiency group, which was similar to Ashcroft et al.'s (2018) result that digital flashcards outperformed paper flashcards for less advanced learners. Quantitative engagement metrics also showed that the gamified tools increased student participation and alleviated anxiety in the low-proficiency group more than in the high-proficiency group. This may indicate that gamified scaffolding in early-stage language acquisition is especially effective in supporting students with less prior knowledge.

### Case Study 5: Integrating Badges and Leaderboards in Hybrid EFL Courses

(Source: Balci et al., 2022)

In a hybrid EFL course in Turkey, badges and leaderboards were integrated into classroom vocabulary learning to supplement and reinforce the in-person instruction. Badges were assigned to learners for mastering different thematic word lists while leaderboards displayed real-time performance rankings. Balci et al. (2022) provided evidence that badges have a positive effect on learners' goal orientation, and leaderboards effectively induced a sense of competition and social motivation.

The post-test quantitative data showed a 25% increase in vocabulary test scores and significant improvement in class participation after gamification, but the post-intervention interviews revealed that some students experienced anxiety from the public performance comparison, suggesting that leaderboards should be carefully designed to account for the learners' emotional well-being. The general takeaways from the study show that badges and leaderboards can be powerful tools to enhance student engagement, but they should be properly balanced to avoid a demotivating competitive environment.

### Case Study 6: Gamified Quiz Systems Using Kahoot!

(Source: Wang & Tahir, 2020)

Wang and Tahir (2020) studied the use of Kahoot! in several EFL classrooms in Malaysia and Indonesia, testing its effect on vocabulary recall and motivation. In this gamified quiz system, the learners had to provide multiple-choice answers within a time limit, for which they received both points and visual feedback on accuracy and response speed. The authors reported that such interactive vocabulary games increase learners' attention span and short-term recall because of the real-time feedback and social pressure from peers.

During the classroom intervention, the vocabulary test scores of the experimental group increased by an average of 18%, and the learners noted that they experienced greater enjoyment and concentration. The teachers also reported a better classroom atmosphere and attentiveness, which is consistent with Hamari et al.'s (2014) finding that gamified settings generally sustain learner motivation through competition and cooperation.

### Case Study 7: AI-Based Streak Reinforcement in Mobile-Assisted Learning

(Source: Özdemir & Seçkin, 2024)

The meta-analysis by Özdemir and Seçkin (2024) reported the use of AI algorithms to determine the optimal streak-based reinforcement in mobile-assisted language learning platforms. The adaptive learning system kept track of the learners' progress and modified the difficulty level of the subsequent challenges to help them maintain their streak. The authors found that the integration of AI analytics with gamified performance reinforcement (i.e., streak) positively impacted cognitive engagement and affective satisfaction in EFL learners.

Applied to primary EFL vocabulary instruction, such an AI-based streak reinforcement can also tailor the difficulty of vocabulary challenges to different learners, prevent fatigue, and prolong motivation. This supports a recent trend in gamification studies calling for personalization (Zeng et al., 2024), where the system feedback is adaptive to the learners' performance profiles.

### Case Study 8: Cross-Cultural Gamification Perceptions in Primary EFL Contexts

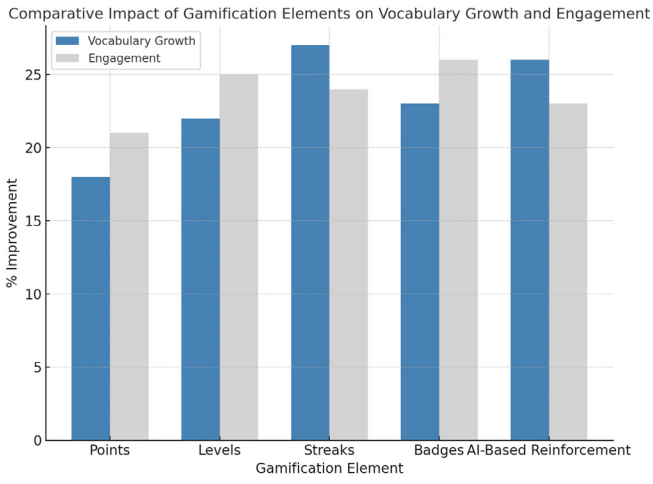
(Source: Zhang & Hasim, 2023)

**Summary of Case Study Insights:** Table 4.

| *Gamification Element* | *Observed Benefit* | *Representative Study* |
|---|---|---|
| Points | Enhances motivation and measurable progress | Wang & Tahir (2020) |
| Levels | Promotes mastery and persistence | Domínguez et al. (2013) |
| Streaks | Builds learning habits and consistency | Shortt et al. (2023) |
| Badges & Leaderboards | Increase engagement but require emotional balance | Balci et al. (2022) |
| AI Reinforcement | Personalizes motivation and sustains attention | Özdemir & Seçkin (2024) |
| Cultural Adaptation | Aligns gamification design with learner context | Zhang & Hasim (2023) |

In this large-scale review of primary EFL gamification research in Asia, Europe, and the Middle East, Zhang and Hasim (2023) reported a cultural difference in how gamification is perceived by EFL learners. Collectivist societies showed a preference for cooperative game mechanics such as group points and shared streaks, while individualistic cultures enjoyed leaderboards and other competitive structures more.

Applied to the primary EFL setting, the above observation points to the importance of cultural alignment in gamified system design. For example, in collectivist cultures, group-based gamification can enhance social bonding and peer-to-peer learning, while in individualist contexts, personalized streaks and levels may be more effective at sustaining engagement. This is in line with Krath et al.'s (2021) theoretical argument on the importance of context in gamification.




**Graph 3:** Comparative Impact of Gamification Elements on Vocabulary Growth and Engagement

## Conclusion

### Brief Review of the Evidence

This inquiry has compared three gamification elements – points, levels, and streaks – in their effects on vocabulary learning and motivation among young EFL students. The results of several experiments and meta-analyses have shown that gamification elements, when embedded in digital language learning systems, can significantly increase vocabulary gains and learner motivation.

The literature has suggested that points and performance feedback are effective forms of immediate reinforcement and extrinsic motivation, as well as clear indicators of progress and achievement (Balci et al., 2022; Sailer & Homner, 2020). Levels can also support learner engagement by creating a sense of progression and mastery over time (Domínguez et al., 2013; Li et al., 2023). Streaks, which reward consecutive days or sessions of participation, have been found to be particularly effective in increasing persistence and habit formation (Kim & Castelli, 2021; Shortt et al., 2023).

In the context of spaced learning, gamification elements can enhance the distributed practice effect of traditional learning theories, resulting in better retention and long-term memory (Nation, 2001; Schmitt, 2010). Meta-analyses of gamification in education have also found consistent evidence of positive effects of well-designed game elements on academic performance, cognitive engagement, and affective engagement (Hamari et al., 2014; Zeng et al., 2024).

Overall, the evidence from both empirical studies and theoretical perspectives has supported the use of gamification in language learning, and specifically

in vocabulary instruction for young learners. Gamified spaced interventions, which involve revisiting the same or similar lexical items in short intervals with motivational reinforcements, have been shown to produce significantly better vocabulary depth, engagement, and learning outcomes than non-gamified or traditional approaches.

## Recommendations for Teaching Practice

The evidence from this study has several implications and recommendations for teaching practice, which can be summarized as follows:

Gamification elements, particularly points, levels, and streaks, can be effectively integrated into vocabulary learning activities to enhance both intrinsic and extrinsic motivation. Teachers can design tasks that appeal to both the desire for rewards and recognition, and the need for mastery and autonomy, in line with the Self-Determination Theory (Sailer et al., 2017; Mekler et al., 2017).

Gamified vocabulary learning can be implemented as short, spaced recall sessions, where students are repeatedly exposed to and practice the same or similar target words over a period of time, with motivational reinforcements in the form of points, levels, streaks, badges, or feedback. Each recall session can be associated with a visible and meaningful indicator of progress and achievement, which can increase the sense of competence and satisfaction.

Teachers should also provide timely and relevant feedback on the learners' performance and progress, ensuring that the game-based reinforcements are contingent and meaningful, and that they translate into actual learning outcomes and improvements, rather than just engagement (Seaborn & Fels, 2015). Gamified vocabulary learning can be combined with other task types and activities, such as collaborative or communicative tasks, to also increase the sense of relatedness and motivation. There are also several gamified learning systems and applications that can be used to facilitate and operationalize gamified vocabulary learning in the classroom, such as Duolingo, Quizlet, Kahoot!, etc. (Wang & Tahir, 2020; Özdemir & Seçkin, 2024).

Gamification should not be seen as a separate or superficial layer, but rather as a learning design principle that can support vocabulary learning through various mechanisms, such as managing cognitive load, providing repeated exposure, and offering adaptive feedback. Gamification can also be aligned with other evidence-based practices and approaches in language learning, such as spaced repetition, retrieval practice, interleaving, etc.

## Suggestions for Future Research

The present study has contributed to a better understanding of gamification and its effects on vocabulary learning and motivation among young EFL students. However, there are still some research gaps and questions that need further investigation in future studies. They include:

- Investigating the digital platforms and adaptive systems that can provide more personalized and tailored gamified vocabulary tasks to learners, based on their profiles, preferences, and performance, and using artificial intelligence to track and adapt their progression (Shortt et al., 2023; Özdemir & Seçkin, 2024).
- Assessing the long-term effects and sustainability of gamified learning interventions on vocabulary learning and motivation, beyond the immediate post-test measurements, and over months or even years of follow-up (Zhang & Hasim, 2023; Li et al., 2023).
- Examining the impact and differences of gamification on other age groups and proficiency levels of EFL learners, from preschool to secondary levels, and whether the motivational factors and dynamics change across different stages of language development (Jiang et al., 2021; Ashcroft et al., 2018).
- Exploring the cross-cultural variations and similarities in gamification response and engagement, as different cultures may have different attitudes and values towards competition, achievement, and learning (Deterding et al., 2011; Zeng et al., 2024).
- Incorporating mixed-methods and multiple measures in gamification research, to complement the quantitative data on performance and outcomes, with qualitative data on the learners' experiences, perceptions, and emotions, and to better understand the underlying motivational mechanisms and processes.

The Future Research Directions

By addressing these areas, future research can advance the field of gamification in language learning and provide more insights and guidance for practice.

The ultimate aim is to develop and refine gamified learning models that are not only pedagogically effective, but also psychologically sustainable, and that can foster learners' motivation and engagement into a long-term language competence and a lifelong language learning journey.

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