



Gamification in L2 Vocabulary Acquisition for Primary Education: A Systematic Literature Review (2019-2024)

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Abstract

The acquisition of second language (L2) vocabulary in primary education faces significant hurdles due to cognitive demands and declining student engagement. This Systematic Literature Review (SLR) evaluates the effectiveness, motivational impact, and implementation challenges of integrating gamification into L2 vocabulary learning for primary students. Guided by PRISMA protocols, 25 high-impact journal articles published between 2019 and 2024 were analyzed. The results indicate that gamification significantly enhances both short-term recall and long-term retention compared to conventional methods. Key findings reveal that the "Points, Badges, and Leaderboards" (PBL) triad effectively satisfies psychological needs for competence and autonomy, while immediate feedback loops are critical for maintaining a "flow" state. Furthermore, gamification reduces "Foreign Language Anxiety" by creating a safe-to-fail environment. Despite challenges such as the "novelty effect" and infrastructure gaps, the study concludes that pedagogical integration—where teachers mediate digital tools is the primary driver of success. These findings offer a robust framework for educators to optimize early childhood language acquisition through gamified blended learning.

Keywords: Elementary School; Gamification; L2 Vocabulary Acquisition; Learning Motivation; Systematic Literature Review.

Introduction

In today's digital globalization era, mastering a second language (L2), particularly English, is a crucial competency that must be instilled from an early age. Elementary education serves as the vital initial phase for developing linguistic sensitivity. However, teaching vocabulary to students aged 6–12 is complex due to limited attention spans and the inherent boredom associated with traditional rote

memorization. Conventional methods often correlate negatively with student engagement, leading to high levels of "Foreign Language Anxiety."

Gamification—the application of game design elements in non-game contexts—offers an innovative solution. Grounded in Self-Determination Theory (SDT) and Flow Theory, this approach aims to transform cognitive tasks into engaging challenges. While empirical studies on digital gamification are increasing, a comprehensive synthesis specifically dissecting its impact on primary school students remains limited. Many previous reviews focus on broad age ranges or single applications, leaving a gap in understanding the unique dynamics of the elementary ecosystem.

This Systematic Literature Review (SLR) seeks to map the most effective gamification methods and validate the correlation between motivation and learning outcomes. Specifically, this study addresses:

- The comparative effectiveness of gamification versus traditional methods.
- The most impactful game mechanics for young learners.
- The primary barriers to sustainable implementation in diverse classroom settings.

Methodology

Research Protocol and Framework

This study utilizes a Systematic Literature Review (SLR) approach following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The research was structured using the PICOS framework (Population: Primary students; Intervention: Gamification; Comparison: Traditional methods; Outcomes: Vocabulary retention/Motivation; Study Design: Empirical research).

Search Strategy

The search was conducted across four major databases: Scopus, Web of Science, ERIC, and Google Scholar, covering the period 2019–2024. The search string utilized Boolean operators: (Gamification OR "Game-based learning") AND ("L2 Vocabulary" OR "Second Language") AND ("Elementary School" OR "Primary Education").

Inclusion and Selection Criteria

Articles were included if they: (1) Were peer-reviewed and published in the last five years; (2) Focused specifically on primary/elementary students; and (3) Measured L2 vocabulary acquisition as a primary outcome. To maintain data quality, two independent reviewers screened titles and abstracts. Discrepancies

were resolved through a consensus-based quality appraisal rubric assessing methodological clarity and instrument validity.

Data Extraction

Data Extraction Percentages used in the results were calculated based on the total corpus of selected articles ($N = 25$). For example, if 22 studies reported positive cognitive gains, the frequency is recorded as 88%. This systematic quantification ensures a transparent overview of the current literature landscape.

Results

1. Characteristics and Methodological Profile of the Included Studies

Table 1 presents a comprehensive overview of the methodological characteristics, geographical distribution, and technological focus of the 25 studies included in this systematic literature review. The table is designed to clarify dominant research patterns and contextual trends in gamified vocabulary learning research for primary-level L2 learners.

Table 1. Characteristics and Methodological Distribution of Included Studies ($N = 25$)

Dimension	Category	Number of Studies	Percentage	Representative Studies
Research Methodology	Quasi-Experimental	12	48%	Bai & Pan (2024); Waluyo (2021)
	Mixed-Methods	8	32%	Castillo-Cuesta (2020)
	Qualitative Review-Based	/ 5	20%	Kohnke (2021); Mora et al. (2020)
Geographical Region	East & Southeast Asia	14	56%	Putri & Muzakki (2022); Sun (2023)
	Europe	7	28%	Segura-Robles (2019); Kétyi (2019)
Gamification Tool Focus	Americas & Other Regions	4	16%	Shortt et al. (2021); Werbach (2020)
	Quiz-Based Platforms (e.g., Kahoot!)	15	60%	Wang & Tahir (2020); Gokaslan (2021)
	Mobile Applications (e.g., Duolingo)	6	24%	Kétyi (2019); Shortt et al. (2021)
	Immersive	4	16%	Lee (2022); Zou et al.

Dimension	Category	Number of Studies	Percentage	Representative Studies
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Technologies (AR/VR) (2021)

The methodological dominance of **quasi-experimental designs (48%)** indicates a strong emphasis on measuring causal relationships between gamified interventions and vocabulary learning outcomes. This reflects a growing demand for empirical validation within CALL research. The substantial proportion of **mixed-methods studies (32%)** further demonstrates an awareness that cognitive outcomes must be interpreted alongside affective and behavioral data, particularly when researching young learners.

Geographically, the literature shows a **clear concentration in East and Southeast Asia (56%)**, a region known for early adoption of educational technologies and exam-oriented language learning contexts. This regional skew suggests that findings may reflect specific pedagogical cultures, potentially limiting generalizability to under-resourced or non-digital learning environments.

In terms of technological focus, **quiz-based platforms such as Kahoot! dominate the field (60%)**, likely due to their low entry barrier, ease of classroom integration, and immediate feedback mechanisms. Immersive technologies remain comparatively underexplored, reflecting constraints related to cost, infrastructure, and teacher readiness.

2. Learning Outcomes and Affective Impact of Gamification

To synthesize learning-related findings, **Table 2** categorizes outcomes into cognitive, affective, and pedagogical-technical dimensions, allowing for a multidimensional understanding of gamification effects.

Table 2. Synthesis of Vocabulary Acquisition and Affective Outcomes

Outcome Dimension	Frequency of Positive Findings	Key Results	Supporting Evidence
Cognitive (Vocabulary Acquisition)	22 studies (88%)	Higher post-test scores, improved spelling accuracy, enhanced meaning recall, and stronger long-term retention compared to traditional instruction	Stable vocabulary retention up to 8 weeks post-intervention (Sun & Hsieh, 2023)
Affective (Motivation & Engagement)	25 studies (100%)	Increased enjoyment, engagement, and willingness to	Learners reported feeling relaxed, playful, and less

		participate; reduced foreign language anxiety	afraid of making mistakes (Dewaele & Li, 2021)
Pedagogical / Technical Challenges	7 studies (28%)	Effectiveness mediated by teacher digital competence; risk of novelty fatigue; infrastructure limitations	Repetitive mechanics and weak internet access reduced instructional impact (Putri & Muzakki, 2022)

The findings demonstrate that gamification delivers a dual instructional benefit, simultaneously enhancing cognitive vocabulary gains **and** affective learning conditions. The high percentage of cognitive improvement (88%) suggests that gamified environments facilitate deeper lexical processing, particularly through repetition, multimodal input, and immediate corrective feedback.

Notably, the universal improvement in motivation (100%) underscores gamification's strength in addressing affective barriers commonly faced by young L2 learners, such as anxiety, fear of error, and low confidence. Gamified learning environments reframe vocabulary practice as a low-stakes, playful activity, thereby lowering the affective filter and promoting risk-taking.

However, the presence of pedagogical and technical challenges in nearly one-third of the studies highlights that gamification is not a self-sufficient solution. Its success depends heavily on instructional design quality, teacher mediation, and sustainable integration rather than one-off novelty-driven use.

Prevalence and Pedagogical Function of Gamification Mechanics

To clarify how specific game elements contribute to learning, Table 3 summarizes the most frequently employed gamification mechanics and their pedagogical relevance for primary-level learners.

Table 3. Prevalence and Impact of Gamification Mechanics (N = 25)

Game Mechanic	Number of Studies	Percentage	Pedagogical Function
Points and Scoring Systems	23	92%	Provide immediate reinforcement and support learners' sense of competence
Feedback Loops	22	88%	Enable error correction, sustain learner engagement, and maintain flow
Leaderboards	19	76%	Encourage competition but may increase pressure for

Avatars and Identity Customization	11	44%	low-achieving learners
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Points and scoring systems emerge as the most dominant mechanic, reflecting their effectiveness in providing **clear performance indicators** and extrinsic motivation. Feedback loops are nearly as prevalent, underscoring their crucial role in preventing error fossilization and sustaining learner engagement. Leaderboards, while widely used, present a pedagogical paradox. Although they stimulate competition and excitement, multiple studies caution against overuse, particularly with heterogeneous proficiency groups. In contrast, avatar-based identity features, though less common, play a significant role in supporting autonomy and emotional investment, aligning closely with motivational learning theories.

Discussion

Theoretical Integration of Findings

The results confirm that gamification functions not merely as a motivational overlay but as a **cognitive and affective scaffolding system** that optimizes vocabulary learning conditions for young L2 learners.

Table 4. Theoretical Interpretation and Pedagogical Implications

Theoretical Lens	Interpretative Insights	Pedagogical Implications
Cognitive Theory of Multimedia Learning	Dual coding through visual-verbal integration reduces cognitive load and enhances memory retention	Teachers should select platforms that combine images, sound, and text for concrete vocabulary
Self-Determination Theory (SDT)	Points, levels, and avatars satisfy competence, autonomy, and relatedness needs	Learning design should provide meaningful choices and personalization options
Flow Theory & Affective Filter Hypothesis	Immediate feedback maintains optimal challenge levels and lowers anxiety	Gamification supports inclusive classrooms by enabling safe experimentation
Competition vs. Collaboration	Excessive competition may demotivate weaker learners	Balanced use of cooperative quests and team-based challenges is recommended
Teacher Mediation & Agency	Gamification is effective only when pedagogically	Blended gamification models mitigate the novelty

	orchestrated	effect and ensure sustainability
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From a theoretical perspective, the effectiveness of gamification lies in its alignment with established learning theories. Visual scaffolds support cognitive processing, while motivational mechanics fulfill psychological needs that are critical for sustained engagement. Importantly, the findings reinforce the central role of the teacher as a mediator who transforms game data into meaningful instructional decisions.

Conclusion

This systematic literature review examined the effectiveness of gamification in enhancing second language (L2) vocabulary acquisition among primary-level learners by synthesizing findings from 25 peer-reviewed studies published between 2019 and 2024. The results provide convergent evidence that gamification is not merely a motivational supplement but a pedagogically meaningful approach that simultaneously supports cognitive development and affective engagement in early language learning contexts.

Across the reviewed studies, gamified vocabulary instruction consistently demonstrated superior learning outcomes when compared to traditional, non-gamified methods. A substantial majority of the studies (88%) reported statistically significant improvements in learners' vocabulary mastery, including spelling accuracy, word-meaning association, and short- to medium-term retention. These gains can be attributed to the multimodal nature of gamified environments, which align with the Cognitive Theory of Multimedia Learning by integrating visual, auditory, and textual input. Such integration reduces cognitive load and supports deeper lexical processing, particularly for young learners who are still developing abstract linguistic representations.

Equally important, the review confirms that gamification exerts a powerful affective impact. All included studies reported increased learner motivation, engagement, and willingness to participate in vocabulary learning activities. Gamified tasks transform vocabulary practice into a low-anxiety, "safe-to-fail" experience, thereby lowering the affective filter that often inhibits language acquisition in young learners. This finding is especially significant in primary education, where emotional readiness and confidence play a decisive role in shaping long-term attitudes toward language learning.

From a theoretical standpoint, the effectiveness of gamification is best understood through the integration of Self-Determination Theory and Flow Theory. Core gamification mechanics—such as points, feedback loops, and avatars—consistently fulfilled learners' psychological needs for competence, autonomy, and relatedness, while immediate feedback helped maintain optimal challenge levels. However, the review also reveals that competitive elements,

particularly leaderboards, must be implemented with pedagogical sensitivity, as excessive competition may undermine motivation among lower-proficiency learners.

Importantly, this review highlights that gamification is not a self-operating instructional solution. Its success is strongly mediated by teacher agency, digital competence, and instructional design quality. Studies that reported weaker or mixed outcomes often pointed to issues such as superficial game use, overreliance on novelty, or limited technological infrastructure. These findings underscore the necessity of adopting a blended gamification approach, in which digital game elements are strategically integrated with face-to-face instruction and formative assessment practices.

Despite its contributions, this review is subject to several limitations. The geographical concentration of studies in Asia and Europe limits the generalizability of findings to underrepresented regions with different socio-economic and technological conditions. Additionally, publication bias toward positive outcomes and the predominance of short-term interventions restricts conclusions about long-term vocabulary development across multiple years of primary education.

In conclusion, gamification represents a theoretically grounded and empirically supported approach to vocabulary instruction for young L2 learners when implemented thoughtfully and sustainably. Rather than replacing conventional pedagogy, gamification should be viewed as a cognitive-affective scaffold that enhances instructional quality, learner engagement, and inclusivity. Future research should prioritize longitudinal designs, explore low-tech and AI-driven adaptive gamification models, and investigate the transfer of gamified vocabulary learning to productive language skills. Such efforts will be essential in advancing gamification from an innovative classroom practice to a mature and equitable instructional paradigm in primary language education.

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