

The Impact of Using Digital Gamification on Enhancing Primary School Pupils' Learning of English Collocations and Engagement

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Abstract:

This study examined the impact of digital gamification on primary school pupils' learning of English collocations and engagement. An experimental design was conducted with 60 sixth-grade pupils at Shieba New Primary School, West Zagazig Educational Department, Sharkia Governorate, Egypt, who are divided randomly into an experimental group ($n = 30$) using gamified digital platforms (Kahoot, Quizizz, ColloQuiz, Wordwall) and a control group ($n = 30$) using traditional instruction. The intervention lasted six weeks (with a total of 12 sessions), covering equivalent collocation content for both groups. Data were collected using a collocation achievement test (pre- and post-intervention), a student engagement scale, and classroom observations, as well as the platform logs. Statistical analyses included paired-samples t-tests, independent-samples t-tests, and ANCOVA to tackle pre-test scores.

Results indicated that both groups improved significantly from pre-test to post-test, but the experimental group achieved greater gains ($M = 27.47$, $SD = 3.76$) than the control group ($M = 21.97$, $SD = 4.17$), $t(58) = 5.37$, $p < .001$, Cohen's $d = 1.39$. ANCOVA confirmed that the improvement was attributable to the gamification intervention ($F(1,57) = 68.86$, $p < .001$, partial $\eta^2 = .55$). Engagement outcomes also favored the experimental group, both in self-reports ($M = 4.30$ vs. 3.35 , $t(58) = 7.80$, $p < .001$, Cohen's $d = 2.02$) and classroom observations. The findings demonstrate that digital gamification significantly enhances collocation learning and promotes greater engagement compared to traditional

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methods. The study concludes that gamified instruction is an effective pedagogical approach for primary school English education and recommends further research across different contexts and with extended follow-up measures.

Keywords: gamification, digital learning, collocations, engagement, English language teaching, primary education.

أثر استخدام الألعاب الرقمية (التلعيب الرقمي) في تعزيز تعلم تلاميذ المرحلة الابتدائية للتركيب اللفظية المتلازمة في اللغة الإنجليزية وانخراطهم في عملية التعلم

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مستخلص:

هدفت هذه الدراسة إلى قياس أثر التعلم المعتمد على الألعاب الرقمية Digital Gamification (التلعيب الرقمي) في تحسين تعلم طلاب المرحلة الابتدائية للتركيب اللفظية المتلازمة في اللغة الإنجليزية (Collocations) وزيادة تفاعلهم وانخراطهم في عملية التعلم. وتم تطبيق تصميم تجريبي على ٦٠ تلميذاً من الصف السادس بمدرسة شبيبة الجديدة الابتدائية، إدارة غرب الزقازيق التعليمية، محافظة الشرقية، مصر. وقد قُسم المشاركون عشوائياً إلى مجموعتين: المجموعة التجريبية ($n = 30$) التي تلقت التعليم عبر منصات تعليمية رقمية ألعابية (Kahoot، Quizizz، ColloQuiz، Wordwall)، والمجموعة الضابطة ($n = 30$) التي تلقت التعليم بالطرق التقليدية. واستمر التجريب لمدة ستة أسابيع، بمجموع ١٢ جلسة، مع تساوي محتوى التركيب اللفظية المتلازمة بين المجموعتين. وتم جمع البيانات باستخدام اختبار تحصيلي للتركيب اللفظية المتلازمة قبل وبعد التدخل، ومقياس التفاعل الذاتي للتلاميذ، وملاحظات صفية منظمة، بالإضافة إلى سجلات المنصة. وشملت التحليلات الإحصائية اختبارات t للعينات المرتبطة والمستقلة، وتحليل التباين المشترك (ANCOVA) للتحكم في درجات الاختبار القبلي.

وقد أظهرت النتائج أن كلا المجموعتين حققتا تحسناً ملحوظاً، إلا أن المجموعة التجريبية سجلت درجات أعلى بشكل كبير في الاختبار البعدي ($M = 27.47$)، ($SD = 3.76$) مقارنة بالمجموعة الضابطة ($M = 21.97$)، ($SD = 4.17$)، ($t(58) = 5.37$)، $p < .001$ ، $Cohen's d = 1.39$ كما أكد تحليل ANCOVA قوة هذا التأثير، $F(1,57) = 68.86$.

partial $\eta^2 = .55$ ، $p < .001$ أما نتائج التفاعل والانخراط في التعلم، فقد كانت في صالح المجموعة التجريبية ($M = 4.30$) مقابل ($t(58) = 7.80$ ، $p < .001$)، Cohen's $d = 2.02$. وتشير النتائج إلى أن التعلم المعتمد على الألعاب الرقمية (التلعيب الرقمي) يعزز تعلم التراكيب اللفظية المتلازمة ويزيد من مشاركة وانخراط الطلاب في عملية التعلم مقارنة بالطرق التقليدية. وتخلص الدراسة إلى أن دمج الألعاب الرقمية في التعليم يعد استراتيجية تربوية فعالة في تعليم اللغة الإنجليزية على مستوى المرحلة الابتدائية.

الكلمات المفتاحية: الألعاب الرقمية (التلعيب الرقمي)، التعلم الرقمي، التراكيب اللفظية المتلازمة، التفاعل والانخراط في التعلم، تعليم اللغة الإنجليزية، التعليم الابتدائي.

Introduction:

We are living in a fast-growing digital age in which technology plays a pivotal role in shaping how the learning process is fulfilled. Within this digital age, education in general and language education in particular witness rapid growing transformation. Among these transformations is the integration of digital gamification in educational settings with the aim of enhancing language learning.

In recent years, the integration of digital gamification into language learning has gained considerable attention as an innovative pedagogical approach. Gamification, defined as the use of game elements and mechanics in non-game contexts, has been shown to foster learner motivation, increase engagement, and improve learning outcomes in educational settings (Wulantari et al., 2023; Ko & Eslami, 2021).

One of the persistent challenges in teaching English to young learners lies in the mastery of collocations, which are essential for achieving naturalness and fluency in communication. Collocations such as 'make a decision', 'take a risk', or 'heavy rain' are difficult to acquire because they require more than knowledge of individual words; learners must also understand the semantic and syntactic restrictions governing word combinations (Paradiž, 2023). Digital gamification provides repeated exposure, interactive feedback, and contextualized practice, which makes it effective in facilitating collocational competence (Foroutan Far & Taghizadeh, 2024; Kindregan, 2019).

At the same time, primary school pupils today are digital natives who are highly familiar with smartphones, tablets, and computers. Leveraging this familiarity through gamified activities can transform passive classroom learning into active participation, thereby enhancing engagement and motivation (Chowdhury et al., 2024; Syawaluddin, 2025). Platforms such as Kahoot, Quizizz, and tailored applications like ColloQuiz have already demonstrated their effectiveness in promoting vocabulary learning, collaborative tasks, and flow experiences (Paradiž, 2023; Kayımbaşoğlu et al., 2016).

However, few studies have examined the combined impact of digital gamification on collocation learning and engagement at the primary level. Most prior research has either focused on vocabulary, grammar, or adult learners (Castillo-Cuesta, 2020; Kucuk, 2023). To address this

gap, the present study was conducted as an experimental field study on sixth-grade pupils at Shieba New Primary School, West Zagazig Educational Department, Sharkia Governorate, Egypt. The research investigates how digital gamification strategies can enhance both English collocation acquisition and learner engagement when compared with traditional instruction.

1.Context of the Problem:

In Egypt, recent reforms in the educational system have focused on enhancing English language learning at the primary level, recognizing it as a gateway to academic achievement and future career opportunities. Vaishnav (2024) emphasized that English is not only a global language but also a prerequisite skill for success in higher education and professional life. However, many primary school pupils still face difficulties in mastering English collocations, which are key to developing natural and fluent communication. Paradiž (2023) explained that collocations are among the hardest aspects of vocabulary because they cannot be learned through direct translation and require authentic contextual exposure. Similarly, Srisanngam et al. (2025) found that EFL learners often struggle to internalize collocational patterns without repeated and meaningful practice (Mansor et al., 2024; Zolfaghari et al., 2025).

A second challenge relates to learner engagement. Romero-Rodríguez et al. (2024) reported that teacher-centered instruction, still dominant in Egyptian primary schools, often leads to passive learning, low motivation, and limited interaction. For young learners, who require stimulating and interactive methods to maintain focus, this is a significant barrier. Chowdhury et al. (2024) and Matyakhan (2024) highlighted that primary pupils benefit more from playful, technology-supported environments that foster active participation.

To address these challenges, researchers have pointed to digital gamification as a promising solution. Wulantari et al. (2023) described gamification as the integration of game elements—such as rewards, competition, collaboration, and progress—into the learning process to enhance motivation. Reinders (2016) confirmed its value in creating

dynamic classroom experiences. Foroutan and Taghizadeh (2024) showed that digital game-based methods improve vocabulary and collocation learning, while Hazar (2020) found that gamification boosts enjoyment and participation. Özdemir (2024) further demonstrated its consistent positive impact on student engagement and learning outcomes in primary education (Dehghanzadeh et al., 2021).

Hence, the present study was implemented experimentally at Shieba Primary School, West Zagazig Educational Department, Sharkia Governorate with sixth-grade pupils. The school context reflects both the persistent challenges and the emerging opportunities: while students are already familiar with digital devices such as mobile phones and computers, gamification is rarely integrated into their learning. By applying digital gamification in real classroom conditions, this experimental field study investigates its effectiveness in improving both collocational competence and learner engagement among young Egyptian EFL learners.

2.Statement of the Problem:

Despite the increasing interest in integrating digital technologies in education, primary school pupils often face difficulties in mastering English collocations, which are essential for fluent and accurate language use. Traditional teaching methods, which rely heavily on rote memorization and teacher-centered instruction, have shown limited effectiveness in fostering both language knowledge and active engagement. This highlights the need for innovative instructional strategies that can simultaneously enhance learning outcomes and motivation.

In response to this challenge, the present study investigates the potential of digital gamification as an instructional approach to improve the learning of English collocations among primary school pupils. In addition, the study examines the effect of gamified digital activities on pupils' engagement in learning compared to conventional classroom practices.

• Pilot Study:

To ensure the clarity, feasibility, and appropriateness of the study instruments and intervention procedures, a pilot study was conducted prior to the main research. A small group of 15 participants from the

target population participated in the pilot. The Collocation Achievement Test, Student Engagement Scale, and Classroom Observation Checklist were administered under the same conditions planned for the main study.

The pilot revealed minor issues with the wording of some test items and the timing of the intervention sessions. These issues were addressed by refining item phrasing, adjusting instructions, and confirming that the 45-minute session length was suitable for all participants. The pilot study also provided preliminary evidence of the reliability of the instruments, with Cronbach's alpha for the recognition subscale of the achievement test approximately 0.86, indicating high internal consistency.

3. Research Questions:

Based on the problem statement and the pilot findings, the following research questions were formulated:

- 1- To what extent does digital gamification enhance primary school pupils' learning of English collocations compared to traditional methods?
- 2- How does digital gamification affect pupils' engagement in English language learning compared to traditional classroom practices?
- 3- Is there a significant difference between the experimental group (using digital gamification) and the control group (using traditional methods) in terms of collocational knowledge and learning engagement?

4. Objective of the Study:

The purpose of this experimental field study is to investigate the impact of digital gamification on enhancing primary school pupils' acquisition of English collocations and their engagement in learning. While conventional instruction in Egyptian primary schools relies heavily on textbooks and teacher-centered methods, this study explores whether game-based approaches can provide a more effective and motivating learning environment. By comparing a control group taught through traditional methods with an experimental group taught using digital gamification, the research seeks to determine the extent to which gamification fosters improved collocational knowledge and active

participation among sixth-grade pupils at Shieba Primary School, West Zagazig Educational Department, Sharkia Governorate.

5. Research Hypotheses:

Considering the research questions, the following hypotheses were proposed:

- 1- There is a statistically significant difference at the 0.05 level between the experimental group taught using digital gamification and the control group taught using traditional methods in favor of the experimental group regarding English collocation learning.
- 2- There is a statistically significant difference at the 0.05 level between the experimental group and the control group in terms of pupils' engagement, with the experimental group showing higher levels of engagement.
- 3- The use of digital gamification positively affects both collocational knowledge and engagement among primary school pupils compared to traditional instruction.

6. Significance of the Study:

This study carries significance at both the theoretical and practical levels:

- Addressing collocational challenges. Paradiž (2023) highlighted that collocations are among the most difficult aspects of vocabulary for EFL learners, while Srisanngam et al. (2025) emphasized the need for contextualized practice to master them. By targeting collocational learning, the study tackles a neglected yet critical aspect of language development among Egyptian primary school pupils.
- Enhancing engagement. Abdel Latif (2024) noted that traditional classrooms often fail to maintain learners' attention, while Foroutan and Taghizadeh (2024) demonstrated that gamification fosters greater interest, motivation, and participation. This study directly responds to the urgent need for more engaging pedagogical approaches in Egyptian schools.
- Contributing to the research gap. Although Reinders (2016) and Wulantari et al. (2023) confirmed the benefits of gamification internationally, there is still a lack of empirical evidence from Egyptian primary education. By implementing the study at Shieba

Primary School, this research provides localized insights that can inform teachers, curriculum designers, and policymakers.

- Practical classroom implications. The findings can encourage teachers to integrate digital tools already familiar to pupils into language learning. This aligns with global trends that promote student-centered, technology-enhanced learning environments.

This systematic procedure allowed for careful monitoring of the intervention, ensured consistency across participants, and provided a comprehensive dataset for evaluating the effectiveness of the program.

7. Delimitations of the Study:

The current study was delimited to:

- 1- Sixty sixth-grade participants enrolled at *Shieba New Primary School*, West Zagazig Educational Department, Sharkia Governorate, Egypt, during the second term of the 2024/2025 academic year.
- 2- An intervention which focused exclusively on *English collocations*.
- 3- Digital gamification carried out on four specific digital platforms: *Kahoot*, *Quizizz*, *ColloQuiz*, and *Wordwall*.
- 4- A six-week duration of intervention (with a total of 12 instructional sessions).

8. Literature Review:

The theoretical framework forms the basis of this research, clarifying the concepts associated with digital gamification and its role in English language learning, particularly in developing collocations among primary school pupils. It also reviews the educational dimensions and previous relevant studies, with the aim of linking theory to practice and clarifying the knowledge gaps the research seeks to address.

9-1 Digital Gamification:

Digital gamification is the deliberate application of game elements and game-design techniques (for example: points, badges, leaderboards, levels, challenges, immediate feedback, and narratives) to non-game contexts via digital platforms and applications, with the purpose of increasing motivation, guiding learner behaviour, and shaping learning trajectories (Reinders, 2016; Wulantari et al., 2023). In language education the term covers a range of practices that vary in intensity and

complexity: from lightweight “points-and-badges” overlays on normal classroom activities (surface gamification) to fully designed, curriculum-aligned digital tasks that use narrative, adaptive difficulty and social mechanics to structure sustained learning (deep gamification) (Wu et al., 2012; Chowdhury et al., 2024).

- **Distinction between Gamification and Game-Based Learning:**

It is important to distinguish “gamification” from “game-based learning.” Gamification typically means adding discrete game elements (scores, timers, badges, levels) to learning tasks while game-based learning uses whole games (serious games, simulations, etc.) as the learning environment itself (Reinders, 2016). Both approaches can be digital; both can be applied for vocabulary, grammar, or collocations. The current study focuses on *digital gamification* (the intentional insertion of game elements into digital tasks) because it is readily deployable in classroom settings using platforms such as Kahoot, Quizizz, ColloQuiz, and Wordwall and allows fine-grained alignment with textbook targets (Castillo-Cuesta, 2020).

- **Why Gamification Matters for Language Classrooms:**

Contemporary reviews and meta-analyses show that gamification can (a) increase learner motivation and engagement, (b) provide repeated, low-stakes practice with immediate feedback, and (c) structure opportunities for social interaction — all of which are pedagogically useful for language acquisition (Wulantari et al., 2023; Özdemir, 2024). Reinders (2016) and others argue that digital game elements create multimodal, interactive environments that change learners’ affective states and encourage voluntary, extended practice — conditions favourable for noticing and automatization of multi-word sequences such as collocations (Breslin, 2019).

- **Core Game Elements and Their Pedagogical Affordances:**

Digital gamification incorporates several core game elements, each serving distinct pedagogical purposes that can be effectively applied to collocation-focused activities. Points and scores provide simple quantitative feedback on performance, reinforcing learning immediately and allowing learners to track their progress over time, which is particularly valuable for formative assessment. Badges and achievements

act as symbolic recognition of mastery or milestones, thereby fostering a sense of competence and identity-building (Azar & Tan, 2020).

Leaderboards and ranks encourage competition and social comparison, which can enhance motivation if used carefully; however, with young learners, they must be applied cautiously to avoid anxiety or discouragement among lower-ranked pupils. Levels and progressive unlocking guide learners from simple to more complex tasks, offering structured scaffolding that maintains a sense of achievable progression. Timed challenges and countdowns enhance focus and fluency by creating mild time pressure, though these must be calibrated to suit the pacing needs of primary pupils (Anisa et al., 2020; Alabbasi, 2018).

Another essential element is immediate corrective feedback, which digital platforms can deliver at the item level, providing explanations that are crucial for noticing collocational constraints. Narratives and scenarios, on the other hand, situate collocations within meaningful contexts such as stories or role plays, thereby enriching contextualized exposure and pragmatic appropriateness. Finally, social mechanics such as team-based tasks and collaboration promote negotiation of meaning, peer scaffolding, and deeper processing. Empirical evidence (Foroutan Far & Taghizadeh, 2024; Wulantari et al., 2023) confirms that when these game elements are pedagogically aligned, they effectively support both affective dimensions of learning—such as motivation and enjoyment—and cognitive dimensions, including retrieval practice and noticing.

- **Design Heuristics for Effective Digital Gamification in Primary ELT:**

Designing gamified collocation activities in primary English language teaching requires careful alignment between game mechanics and learning objectives. Several practical heuristics can guide this process. First, mechanics should be aligned with objectives by selecting elements that directly scaffold the target behavior, for example, using repeated quick quizzes for retrieval practice or incorporating narratives and role plays to support productive use.

Second, instructional sequencing should follow a notice–recognition–production pattern: learners are first exposed to collocations and encouraged to notice them through stories or highlighted examples, then practice recognition through matching or multiple-choice tasks, and finally move to production through sentence-building or role-play activities. Third, challenges should be adaptive, providing progressively difficult levels so that learners can experience competence while avoiding boredom or frustration, thereby supporting flow states. Another important heuristic is to ensure meaningful feedback: learners should not simply be told that an answer is “wrong,” but also receive explanations that clarify collocational constraints and help them refine their interlanguage (Syawaluddin, 2025).

Additionally, tasks should balance individual and collaborative formats by alternating between self-paced quizzes (e.g., Quizizz) and team competitions or collaborative glossary-building (e.g., Kahoot or ColloQuiz), thus combining deep processing with social interaction. Given the cognitive and attentional profiles of primary pupils, sessions should remain short and varied, typically lasting 30–45 minutes and broken into micro-tasks that are visually stimulating. Finally, teacher orchestration and reflection are essential, as teachers must frame activities, model examples, and use analytics to re-teach missed items. Gamification, therefore, should be viewed as a pedagogical tool that complements rather than replaces teacher judgment (Alabbasi, 2018).

•Specific Advantages for Collocation Learning:

Digital gamification offers several unique advantages that make it particularly well-suited for teaching collocations. One of the most important is high-frequency, contextualized exposure, as digital tasks can recycle the same collocations across dialogues, descriptions, and problem-solving scenarios, thereby accelerating chunking and supporting implicit learning. A second affordance lies in noticing through feedback, since immediate corrective explanations enable learners to recognize collocational restrictions such as verb–noun combinations or preposition patterns (Srisanngam et al., 2025).

Retrieval practice also plays a critical role, with quizzes and timed rounds forcing active recall that strengthens memory traces for multi-word units (Rasti-Behbahani, 2022). In addition, gamification provides

production opportunities through interactive story-builders and role-play simulations that require learners to use collocations productively in communicative contexts (Chowdhury et al., 2024). Finally, collaborative construction enhances ownership of learning, as applications that allow students to build a shared collocation bank (e.g., ColloQuiz-style platforms) foster investment, deeper processing, and active participation (Paradiž, 2023). Collectively, these affordances highlight the potential of gamification to integrate recognition, feedback, retrieval, production, and collaboration into a coherent pedagogical design for collocation learning (Sari & Ningsih, 2022).

- **Age- and Context-Sensitive Considerations in Egyptian Primary Classrooms**

When applying digital gamification in Egyptian primary classrooms, it is essential to account for learners' distinct cognitive, social, and attentional profiles. Young pupils benefit most from short bursts of activity combined with multimodal inputs—such as audio, images, and simple text—rather than lengthy reading tasks. Instruction should also minimize cognitive load by presenting collocations with strong contextual cues like pictures, gestures, and short dialogues, thereby reducing extraneous processing (Sweller-inspired reasoning) (Rusmiyanto et al., 2023).

Competition must be inclusive: team leaderboards and rotated roles are preferable, with recognition given for effort and improvement, not only for top scores, to avoid discouragement. Practical constraints such as limited devices and bandwidth also need to be addressed by favoring mobile-first, low-bandwidth platforms, using offline-ready bundles, or implementing paired-device strategies when individual access is not possible. Finally, successful implementation requires teacher training and effective classroom management. Teachers need concise, practice-oriented professional development to operate digital platforms, interpret analytics, and manage classroom transitions smoothly (Wulantari et al., 2024; Alabbasi, 2018). Taken together, these considerations ensure that gamification is developmentally appropriate, context-sensitive, and

feasible within Egyptian primary education settings (Romero-Rodríguez et al., 2024).

- **Risks and Limitations:**

Although the benefits of digital gamification in language learning are well-documented, the literature also highlights several risks and limitations that must be carefully considered. One concern is the potential over-reliance on extrinsic rewards, where poorly designed gamification emphasizes points or badges at the expense of genuine learning, creating an over justification effect; therefore, rewards must be meaningfully linked to learning outcomes to sustain intrinsic motivation. A second limitation relates to equity, as unequal access to devices or reliable internet may widen educational gaps unless managed through strategies such as device rotation or scheduled use of school computer labs (Reinders, 2017).

Teacher workload and design quality also present challenges, since meaningful gamification requires significant initial effort in design and continuous orchestration during implementation; without sufficient teacher buy-in, the fidelity of the intervention may be undermined (Alabbasi, 2018). Technical problems, such as connectivity failures, can further disrupt classroom flow, while issues of data protection and student privacy require close attention, as highlighted by Kucuk (2023) in the context of AI tools. Finally, curricular misalignment is another risk, as gamified tasks that are not tightly integrated with learning objectives may increase engagement but fail to enhance targeted knowledge. These limitations suggest that while gamification is a powerful pedagogical tool, its effectiveness depends on thoughtful design, equitable access, and careful alignment with curriculum goals (Wen, 2023).

- **Platforms Chosen for this Study and Their Uses:**

- Several platforms are particularly well-suited for classroom gamification of collocations:
- **Kahoot:** quick whole-class competitions; effective for recognition and retrieval practice; strong motivational effect (Özdemir, 2024). Best used for short recognition checks, warm-ups, and formative assessment.

- **Quizizz:** self-paced quizzes with immediate feedback and flexible pacing; useful for homework or in-class rotations. Good for spaced practice.
- **ColloQuiz (or similar custom apps):** supports collaborative glossary-building and revision; excellent for co-construction and ownership (Paradiž, 2023).
- **Wordwall / interactive builders:** drag-and-drop matching, sentence scramble, and memory games — useful for mapping collocational partners (verb + noun, adj + noun) in multimodal ways.

•**Implications for the Present Study (Sheiba New Primary School):**

Given the theoretical affordances and the practical constraints outlined above, digital gamification is a justifiable and promising intervention for collocation learning in the Sheiba Primary School context. The chosen platforms (Kahoot, Quizizz, ColloQuiz-style tasks, Wordwall) allow the study to (a) deliver high-frequency, contextualized exposure, (b) provide immediate feedback and retrieval practice, and (c) combine individual and collaborative tasks that are age-appropriate. To ensure fidelity and ethical practice, the implementation plan must include teacher training, device contingency strategies, and clear rubrics for measuring collocational learning and engagement (Hasram et al., 2020).

9-2 Collocations:

Collocations are conventionalized combinations of two or more words that co-occur with greater than chance frequency and produce natural-sounding language for native speakers (e.g., *make a decision*, *heavy rain*, *rely on*). They are not simply arbitrary pairings but reflect patterned lexical preferences and syntactic constraints; mastery of collocations therefore contributes directly to fluency, idiomaticity, and communicative appropriateness in L2 production and comprehension (Srisanngam et al., 2025; Paradiž, 2023).

In the present study collocations were operationalized as multi-word sequences that: (a) appear regularly as conventional phrases in the target curriculum and corpora for the age level; (b) are semantically compositional yet show restricted combinatorial options (i.e., a target

verb prefers a limited set of noun partners); and (c) are pedagogically appropriate for sixth-grade learners (age- and level-appropriate vocabulary, concrete contexts). Target items for the intervention were selected from the Grade 6 English textbook and cross-checked against frequency evidence from learner/curricular corpora and validated by two experienced EFL teachers (Ningsih & Sari, 2021).

•Typology of Collocations — Practical Classification for Instruction:

A clear typology helps teachers design focused activities and assessment. This study used a twofold classification (lexical vs grammatical) with subtypes that directly informed activity design (Mee et al., 2020; Matyakhan, 2024):

A. Lexical Collocations (content word + content word):

- *Verb + Noun* (e.g., *make a mistake, take a photo, catch a cold*): emphasis on verb-noun pairing — good for matching and production tasks.
- *Adjective + Noun* (e.g., *heavy rain, strong wind, bright idea*): lends itself to picture prompts and sentence completion.
- *Noun + Noun* (e.g., *job opportunity, data analysis*): useful for topic-based mini-projects.
- *Adverb + Adjective* (e.g., *deeply concerned, highly effective*): higher-level, used sparingly with primary learners.

▪ B. Grammatical Collocations (content word + grammatical word):

- *Noun + Preposition* (e.g., *interest in, reason for*): targeted using gap-fill and preposition matching activities.
- *Verb + Preposition / Phrasal verbs* (e.g., *rely on, look after*): practiced through role plays and contextualized dialogues.
- *Adjective + Preposition* (e.g., *good at, afraid of*): practiced via picture-description and personal-sharing tasks.
- This typology guided how collocations were introduced, practiced, and assessed in the field intervention: simpler lexical types (verb + noun, adj + noun) were prioritized for early sessions; grammatical collocations were introduced with rich contextual cues and recycled across later sessions.

- **Developmental Considerations for Primary Learners:**

Primary learners differ significantly from adolescents and adults in terms of cognitive capacity, attention span, and their need for multimodal support. Accordingly, the instructional design in this study treated collocation learning as a developmental process, staged through increasing cognitive demands. At the recognition stage, pupils were exposed to collocations through brief contextual inputs such as short dialogues and illustrated sentences, which directed their attention to collocational partners (Mohamed, 2024).

This was followed by recognition with controlled practice, where learners engaged in matching, multiple-choice, and drag-and-drop tasks that emphasized recognition without imposing high production demands. In the guided production stage, pupils began constructing sentences and completing gap-fill activities with teacher scaffolding to support accuracy and confidence. Finally, free production and communicative use were encouraged through role-plays, storytelling, and mini-projects, where learners applied collocations in meaningful communicative contexts. To support this developmental progression, the study emphasized multimodality—integrating images, audio, and gestures—to reduce extraneous cognitive load and make collocations more memorable for young learners.

- **Acquisition Mechanisms: Theoretical Grounding Linked to Practice:**

The acquisition of collocations in the current study was framed by usage-based and noticing-based theories, emphasizing repeated contextualized exposure, frequency effects, and attention to form in context as central mechanisms (Srisanngam et al., 2025; Rasti-Behbahani, 2022). In practice, several mechanisms supported learning. Input frequency and contextual variety ensured that collocations were recycled across diverse contexts—dialogues, narratives, and instructional tasks—helping learners encode recurring patterns through chunking. Noticing and feedback were also crucial, as immediate corrective responses from digital platforms, complemented by teacher debriefing,

highlighted collocational choices and supported conscious noticing, which in turn facilitated automatization (Lakkham, 2020).

Retrieval practice further strengthened retention through frequent, low-stakes activities such as quizzes and rapid matching, which reinforced memory traces of multi-word units. Finally, proceduralization was achieved through repeated guided production tasks, enabling knowledge to move from declarative recognition toward fluent, procedural use in communication. Together, these mechanisms created a coherent pathway from input and noticing to active, meaningful production of collocations (Kucuk, 2023).

- **Linking Collocation Instruction to Digital Gamification in the Experiment:**

Each collocation type received matched gamified tasks: verb + noun pairs emphasized through matching and timed recall; adjective + noun via picture description contests; prepositional collocations practiced through role-play missions. The digital environment allowed repeated spaced exposures, immediate corrective feedback, and collaborative glossary construction — all designed to maximize the mechanisms (noticing, retrieval, proceduralization) that support collocation learning.

- **Measurement Triangulation and Evidence Quality:**

To triangulate learning evidence the study combined: (a) pre/post collocation test scores; (b) engagement scale and classroom observation; (c) platform logs (accuracy, response time, repeat attempts); and (d) teacher notes. This multimethod approach increases the credibility of inferences about collocational gains and helps interpret whether scores reflect true learning or only short-term test effects.

9-3 Engagement:

Learner engagement is widely regarded as one of the central conditions for effective learning, especially in language education where sustained motivation and practice are essential. In the context of this study, which examined the use of gamification to enhance collocation learning among primary school pupils, engagement played a dual role: first, as an immediate outcome of introducing game-based elements, and second, as a mediating factor influencing the effectiveness of collocation acquisition (Mohamed, 2024).

Researchers generally classify engagement into three interrelated dimensions: behavioral, emotional, and cognitive. Each of these dimensions can be directly linked to the mechanisms of digital gamification observed in this study (Zhang & Hasim, 2023; Waer, 2021):

- **Behavioral Engagement** reflects the outward signs of student participation, such as attentiveness, persistence in tasks, and active contribution during classroom activities. Within the gamified lessons, behavioral engagement was observed through students' willingness to attempt multiple levels of the digital games, to compete in leaderboards, and to complete practice rounds without teacher prompting. For primary learners, such behavioral engagement is critical because it ensures that repeated exposure to collocations actually occurs, which is essential for retention and mastery.
- **Emotional Engagement** refers to the affective side of learning, including interest, enjoyment, enthusiasm, and attitudes toward English as a subject. Gamification, by design, introduces playfulness into learning. Rewards such as badges, visual animations, or sound effects generated excitement among the students, transforming collocation practice from a routine exercise into an enjoyable experience. This positive emotional state reduces anxiety, encourages risk-taking in language use, and fosters a more supportive classroom climate. For example, learners who might previously hesitated to produce full sentences became more confident when the task was presented in a low-stakes game format.
- **Cognitive Engagement** goes beyond surface-level participation and involves the depth of mental effort learners are willing to invest. In this study, cognitive engagement was evident when learners applied strategies such as recalling collocations from previous rounds, using them in new contexts, or reflecting on errors after receiving immediate digital feedback. By structuring the games with gradually increasing levels of challenge, students were nudged toward deeper thinking and problem-solving, rather than simply matching words mechanically.

Overall, engagement in this research was not only observable in student behavior but also measurable in terms of their persistence, enthusiasm, and cognitive investment. In line with prior research

(Matyakhan, 2024; Abdel Latif, 2024), the findings reaffirm that engagement functions as both a necessary condition for learning to occur and a predictor of long-term academic achievement.

Mechanisms: How Digital Gamification Supports Collocation Learning

Digital gamification supports collocation learning not through a single pathway but via a network of complementary mechanisms that together foster attention, practice, and retention. These mechanisms serve as the bridge between theoretical foundations—constructivism, self-determination theory, and flow theory—and practical classroom outcomes. For primary learners in particular, such mechanisms are essential, as younger students require repeated input, immediate reinforcement, and motivating contexts to sustain attention.

One key mechanism is directed, repeated contextual exposure, since repetition is a powerful predictor of collocation acquisition. Unlike rote drilling, gamification embeds repetition within meaningful and varied contexts such as narratives, challenges, and role-play scenarios. For instance, collocations like *'make a decision'* or *'take a risk'* can appear across dialogue-based quizzes, puzzles, and timed challenges, encouraging implicit learning and chunking. Castillo-Cuesta (2020) confirmed that gamified reading tasks significantly improved collocation recognition, highlighting the importance of repeated contextual encounters.

Another critical mechanism is immediate, informative feedback, which digital platforms provide in real time. When a pupil selects *'do a decision'* instead of *'make a decision'*, the system highlights the error and explains the correct form. This rapid feedback loop helps learners notice collocational restrictions and restructure their interlanguage before errors become fossilized. Prior studies have emphasized the value of such feedback in accelerating uptake (Kucuk, 2023; Foroutan & Taghizadeh, 2024). Gamification also facilitates active retrieval and spaced practice, as activities such as quizzes, flashcards, and timed matching games demand active recall, a process far more effective for retention than passive exposure. By spacing these retrieval opportunities across sessions, digital platforms further strengthen memory consolidation,

consistent with evidence from Rasti-Behbahani (2022) and Özdemir (2024).

A further mechanism involves contextualized production opportunities. Beyond recognition, learners must actively produce collocations in speech and writing to achieve fluency. Gamified sentence-building challenges, role-play scenarios, and fill-in-the-gap tasks prompted pupils to use collocations in meaningful contexts. Research by Chowdhury et al. (2024) and Srisanngam et al. (2025) demonstrated that such output-oriented gamified activities improve learners' ability to generate collocations spontaneously. Social interaction and collaborative construction also play an important role, as multiplayer and team-based tasks encourage peer negotiation, scaffolding, and shared meaning-making. Collaborative activities, such as co-creating digital glossaries or group competitions, not only enhanced collocational learning but also strengthened interpersonal skills, echoing Lakkham's (2020) findings on the benefits of collaborative digital environments.

Finally, motivational scaffolding and flow induction ensured sustained engagement. By aligning task difficulty with learner ability through adaptive levels, points, and progressive challenges, gamification created flow states in which learners were fully absorbed and motivated. For younger pupils, these motivational supports were especially critical in maintaining persistence and enjoyment across sessions (Foroutan & Taghizadeh, 2024; Wulantari et al., 2023). Collectively, these mechanisms—repetition, feedback, retrieval, production, collaboration, and motivational scaffolding—explain why gamification is particularly effective for collocation learning, offering a coherent pedagogical design that integrates cognitive, social, and affective dimensions.

Engagement Dimensions: How Gamification Affects Each.

The mechanisms of digital gamification feed directly into multiple dimensions of learner engagement. In this study, gamification was found to influence all three major dimensions of engagement: behavioral, emotional, and cognitive. In terms of behavioral engagement, pupils demonstrated higher participation rates and more consistent on-task

behavior. Unlike traditional drills, where attention typically declines over time, the competitive and interactive nature of games sustained behavioral involvement throughout lessons.

These findings are consistent with Abdel Latif (2024), who reported that gamification improved class participation, as well as Özdemir (2024), who documented greater task completion rates in gamified contexts. Emotional engagement was also enhanced, as gamification transformed collocation learning into a playful and enjoyable experience. Features such as animations, points, and friendly competition reduced language anxiety, fostered enjoyment, and encouraged participation. Prior research similarly indicates that gamification nurtures enthusiasm and a sense of achievement, thereby creating a more positive classroom atmosphere (Wulantari et al., 2023; Matyakhan, 2024).

Most critically, gamification strengthened cognitive engagement, as learners applied deeper strategies by retrieving collocations from memory, reflecting on errors, and transferring knowledge to new contexts. Studies such as Ko and Eslami (2021) have shown that digital games stimulate deeper processing of pragmatic competence, while Foroutan and Taghizadeh (2024) confirmed that gamification promotes cognitive investment through flow states. In this study, cognitive engagement was evident when pupils eagerly tackled increasingly complex collocation challenges, showing persistence, problem-solving strategies, and reflective thinking.

Taken together, these findings suggest that gamification supports a holistic model of engagement in which behavioral, emotional, and cognitive dimensions reinforce one another, leading to improved learning outcomes.

Why Focus on Collocations and Engagement in Primary Education?

The decision to focus this research on collocation learning among primary school pupils was rooted in pedagogical, developmental, and contextual considerations. From a pedagogical perspective, collocations form a foundation for fluency, as collocational competence is essential for moving beyond “textbook English” toward natural, idiomatic expression. At the primary stage, exposure to collocations provides scaffolding for later productive skills by building automatic word retrieval.

As Paradiž (2023) and Srisanngam et al. (2025) argue, early mastery of collocations accelerates both fluency and comprehension in subsequent stages of learning. In this study, primary learners who engaged with collocations through gamification were not simply memorizing word pairs but developing intuitive associations that are crucial for future communication. Developmentally, today's pupils are digital natives, growing up in technology-rich environments and responding more positively to interactive, feedback-driven activities than to static textbooks.

As noted by Chowdhury et al. (2024) and Romero-Rodríguez et al. (2024), young learners are highly sensitive to motivation and failing to integrate playful digital tools risks disengagement and weak linguistic foundations. In this study, gamification was therefore not treated as an optional enhancement but as a pedagogical necessity to align instructional methods with learners' natural preferences. Finally, this research addressed a significant evidence gap. While gamification has been extensively studied in relation to vocabulary, grammar, and general motivation (Castillo-Cuesta, 2020; Foroutan & Taghizadeh, 2024), fewer studies have investigated its role in collocation acquisition, especially among primary school cohorts.

9-4 Empirical Evidence from Previous Studies:

Waer's (2021) study aimed to examine the effect of gamification on EFL vocabulary learning and learners' attitudes toward its use. The participants were 68 undergraduate EFL students at New Valley University in Egypt, who were divided into an experimental group and a control group. The experimental group learned vocabulary through Quizizz-based gamified tasks, while the control group studied the same content using traditional paper-based worksheets. The study employed multiple instruments, including an APTIS vocabulary test, an attitude questionnaire, learning logs, and follow-up interviews. The findings revealed that students in the experimental group achieved significantly higher vocabulary gains than those in the control group, indicating that gamification can enhance vocabulary retention and acquisition. Moreover, the experimental group expressed positive attitudes toward

gamification, emphasizing that it increased enjoyment, motivation, and active participation. However, some challenges were noted, such as occasional difficulties with internet access. The study concluded that digital gamification through platforms like Quizizz represents an effective approach to improving vocabulary learning while simultaneously fostering positive learner attitudes toward the learning process.

Mohamed (2024) investigated the impact of gamification on developing reading comprehension skills among sixth-grade primary school pupils in Egypt. A total of 80 pupils were selected from Hassan Alwan Primary School in Sharkia Governorate and divided into an experimental group ($n = 40$) and a control group ($n = 40$). The experimental group received instruction through a gamification strategy, while the control group was taught via traditional methods. A pre-post reading comprehension test and a checklist of target reading skills were used as the primary research instruments. Results showed that the experimental group outperformed the control group significantly in post-test scores, indicating that gamification was highly effective in improving reading comprehension skills at the primary stage. Pupils in the gamified group were more engaged, attentive, and motivated compared to their peers in the traditional classroom. The study concluded that gamification provides an interactive, student-centered learning environment that supports skill development and active participation. It recommended the integration of gamification strategies in EFL instruction at the primary level to improve reading comprehension and overall engagement.

Zhang (2024) investigated the effects of different gamified learning conditions on L2 learners' vocabulary acquisition using Quizlet. A group of 60 Japanese EFL participants took part in the study. They were randomly assigned to three gamified learning conditions: competitive, cooperative, and self-regulated. Findings of the pretest-posttest of vocabulary indicated that all three groups achieved higher scores in the post-test as opposed to their performance in the pre-test due to their participation in the Quizlet games. In addition, there was a statistically significant difference in vocabulary learning between the cooperation and the competition groups, and between the cooperation and the self-

regulation groups with participants in the cooperation group achieving the greatest improvement in the post-test. While both gamified competition and cooperation promoted vocabulary learning, there was no statistically significant difference between the competition and self-regulation groups. It was concluded that gamified competition and cooperation promoted vocabulary acquisition.

Helal's (2024) study investigated the effectiveness of a proposed program integrating focus on form and gamified learning in fostering the comprehension and production of English phrasal verbs by Egyptian majors. Participants were 64 students randomly assigned to an experimental group and a control group. The experimental group received instruction of English phrasal verbs using the proposed program while the control group was taught according to conventional instruction. A pre/post phrasal verbs comprehension test and a pre/post phrasal verbs production test were used as instruments. Posttests results indicated that the experimental group significantly outperformed the control group in overall phrasal verbs comprehension and production scores. Hence, it was concluded that the proposed program proved effective in promoting phrasal verbs comprehension and production among Egyptian English majors.

Bouzaiane and Youzbashi (2024) examined the role of digital-game based language learning (DGBLL) in EFL vocabulary learning and retention. Eighty students enrolled in four different levels of the General Foundation Program at the University of Technology and Applied Sciences, Ibra, Oman constituted the participants of the study. Participants practiced learning the meaning of ten vocabulary items in each level utilizing Kahoot and Wordwall games. A pre-posttest of vocabulary, a vocabulary retention test, and a questionnaire measuring students' perceptions regarding the effectiveness of DGBLL in the vocabulary learning process were utilized to collect data for the study. Results revealed that digital games were effective in vocabulary learning and retention, providing a more engaging foreign language educational environment.

Adzmi et al. (2024) reviewed research on the role of gamification in enhancing engagement and motivation in language learning within the

Malaysian context. They found out that well-designed gamified tools can significantly enhance learner engagement and motivation, and promote language acquisition. Elements such as rewards, challenges, and interactive tasks in gamification provide an enjoyable and immersive learning experience, thus overcoming anxiety and lack of confidence. In addition, gamified platforms provide continuous feedback and reward systems that promote intrinsic motivation and contribute to consistent learner participation.

Nasr (2024) investigated the impact of using Quizlet in vocabulary instruction on developing primary stage students' vocabulary and motivation. To achieve this goal, a group of 60 3rd grade students in the primary stage were assigned to a control group and an experimental group. The experimental group students learnt vocabulary using Quizlet whereas the control group students learnt vocabulary according to conventional instruction. A pre-post vocabulary learning test, a pre post vocabulary learning motivation questionnaire, and field-notes were used for data, collection. Results indicated that Quizlet achieved medium effectiveness in developing students' vocabulary learning and motivation.

Paradiž (2023) examined the use of the ColloQuiz mobile application for collaborative mobile-assisted language learning (MALL) of collocations in academic discourse. The app allowed students to create a bilingual glossary of collocations for reference and revision. Data were collected through an online questionnaire to measure students' perceptions of usability and effectiveness in ESP/EAP learning. The study concluded that students highly valued active involvement in developing learning materials, with differences noted between those who only revised using the app and those who contributed to building the collocation database. These findings emphasized the importance of student participation in material development and encouraged ESP teachers to design customized mobile apps to meet learners' needs.

Foroutan Far and Taghizadeh (2024) compared the effects of digital and non-digital gamification on English as a Foreign Language (EFL) learners' collocation knowledge, perceptions, and sense of flow. The study involved 75 Iranian B1-level students divided into three groups: digitally gamified, non-digitally gamified, and non-gamified. Using pre-

and post-tests, flow questionnaires, open-ended questions, and semi-structured interviews, the study found that both digital and non-digital gamification significantly enhanced collocation knowledge compared to non-gamified methods. The study concluded that gamification increased student satisfaction, promoted teamwork and competition, and fostered a strong sense of flow, recommending its integration into EFL teaching practices.

Vaishnav (2024) explored current trends and future prospects in English Language Teaching (ELT), shaped by technological and pedagogical developments. Using a mixed-methods approach, including a systematic literature review, surveys, and case studies, the study found strong integration of technology such as blended and mobile-assisted learning, along with a growing focus on communicative and intercultural competence. It concluded that future prospects lie in artificial intelligence, virtual and augmented reality, and gamification as tools to enhance ELT, emphasizing the need for continuous professional development and reflective practice for teachers.

Ko and Eslami (2021) aimed to review how digital game worlds contribute to developing second language (L2) pragmatic competence. Analyzing 16 studies, the study focused on multiuser virtual environments (MUEs), synthetic immersive environments (SIEs), and massively multiplayer online role-playing games (MMORPGs). Findings showed that digital game environments enhance pragmatic awareness, production, and interactional skills. However, the study concluded that research in this area remains limited in scope and methodology, highlighting the need for more comprehensive investigations to fully understand the role of digital games in L2 pragmatic development.

Reinders' (2016; 2017) study investigated the role of digital games as interactive, multimodal, and immersive environments for second language learning. It reviewed evidence from general education showing that computer games influence perceptual, cognitive, behavioral, affective, and motivational outcomes, while in language acquisition, they were found to enhance motivation, willingness to communicate, and socialization. The study concluded that although digital game-based language learning holds promise, it remains a relatively new field with

significant gaps, recommending further research to address challenges and expand knowledge in this area.

Abdunnazar's (2024) study aimed to explore emerging trends in English language teaching (ELT) shaped by technological innovation, educational research, and cognitive insights. It examined approaches such as blended learning, flipped classrooms, task-based teaching, and the integration of artificial intelligence and natural language processing. The findings emphasized additional key areas, including data-driven instruction, corpus linguistics, pronunciation, cultural competence, and mobile-assisted learning. The study concluded that modern innovations are reshaping ELT, offering more effective, interactive, and inclusive strategies to enhance learner outcomes.

Alabbasi (2018) sought to investigate teachers' perspectives on the use of gamification techniques in online learning. Data were collected from 47 in-service and pre-service teachers enrolled in a graduate instructional technology program through a Likert-scale survey. Findings revealed that teachers generally viewed gamification positively, recognizing its potential for enhancing course design, but some expressed concerns about possible negative effects on students. The study concluded that while gamification is a promising tool, further research is required to address its limitations and ensure effective implementation in online learning environments.

Abdel Latif's (2024) study aimed to examine the impact of using gamification strategies on vocabulary learning and class engagement among EFL prospective teachers. Conducted with 108 fourth-year English majors at Minia University using an experimental design, the study divided participants into experimental and control groups. Findings analyzed through t-tests showed that the experimental group significantly outperformed the control group in both vocabulary acquisition and engagement in learning. The study concluded that gamification is highly effective in enhancing language learning outcomes and recommended its broader application in teacher education contexts.

Wulantari et al.'s (2023) review study investigated the role of gamification in English language teaching (ELT), focusing on its impact on learner motivation, engagement, and learning outcomes. Gamification, defined as the integration of game elements into

educational contexts, has gained prominence as a strategy to enhance language learning. The findings of the review showed that gamification positively influenced student motivation through elements such as points, leaderboards, and rewards, which fostered a sense of achievement and intrinsic drive. It was also found that gamification promoted active learning and classroom participation, with applications in vocabulary development, grammar practice, and language production. Furthermore, gamification created opportunities for collaboration, peer interaction, and immediate feedback, thereby enhancing both linguistic and interpersonal skills. However, the study noted certain challenges, including technological limitations and the need to balance game elements with curriculum objectives. It also highlighted the importance of teacher training and professional development as essential for successful implementation. Overall, the study concluded that gamification is a powerful tool in ELT, capable of creating immersive and engaging environments that support learners' linguistic proficiency and persistence.

Castillo-Cuesta (2020) aimed to investigate the effectiveness of digital games in enhancing grammar and vocabulary acquisition among English as a Foreign Language (EFL) learners in higher education. Conducted at Universidad Técnica Particular de Loja in southern Ecuador, the study involved 68 B1-level students enrolled in two Communicative Grammar classes. A mixed-method approach was employed, using pre- and post-questionnaires along with writing rubrics to collect and analyze data. Over a five-month academic term, digital games were integrated into instruction, accompanied by continuous feedback. The results demonstrated that digital games significantly improved students' grammar, particularly in the use of modals, gerunds, and infinitives. Additionally, the findings revealed that students expanded their vocabulary knowledge in areas such as jobs and education. The study underscored the potential of digital games as effective tools for improving EFL learners' linguistic competence in higher education contexts.

Table (1) Summary of Previous Studies

Study	Objective	Participants	Method/Tools	Key Findings
Waer (2021)	To examine the effect of gamification on EFL vocabulary learning and learners' attitudes toward its use	68 undergraduate EFL students at New Valley University in Egypt	Quizizz platform + APTIS vocabulary test + an attitude questionnaire + learning logs + follow-up interviews	Gamification helped achieve higher vocabulary gains, indicating that gamification can enhance vocabulary retention and acquisition + Gamification increased enjoyment, motivation, and active participation
Mohamed (2024)	To investigate the impact of gamification on developing reading comprehension skills among sixth-grade primary school pupils in Egypt	80 pupils selected from Hassan Alwan Primary School in Sharkia Governorate	A pre-post reading comprehension test + a checklist of target reading skills	Gamification was highly effective in improving reading comprehension skills at the primary stage + Pupils in the gamified group were more engaged, attentive, and motivated compared to their peers in the traditional classroom
Zhang (2024)	To explore the effects of different gamified learning conditions on L2 learners' vocabulary acquisition using Quizlet	60 Japanese EFL learners randomly assigned to three gamified learning conditions: competitive, cooperative, and self-regulated	Quizlet + pretest-posttest of vocabulary	The three gamified learning conditions achieved higher score in the posttest than in the pretest + A statistically significant difference in vocabulary learning outcomes between the three learning conditions with the cooperation group achieving the greatest improvement in the post-test
Helal (2024)	To investigate the effectiveness of a proposed program integrating focus on form and gamified learning in fostering Egyptian English majors' phrasal verbs comprehension and production	64 Egyptian English majors randomly assigned to an experimental group and a control group	A pre/post phrasal verbs comprehension test + a pre/post phrasal verbs production test	The experimental group significantly outperformed the control group in overall phrasal verbs comprehension and production scores
Bouzaiane and Youzbashi (2024)	To examine the role of digital-game based language learning in EFL vocabulary learning and retention	. 80 students at the University of Technology and Applied Sciences, Ibra, Oman	Kahoot and Wordwall games + Pre-posttest of vocabulary + vocabulary retention test + a questionnaire	Digital games were effective in vocabulary learning and retention, providing a more engaging foreign language educational environment.
Adzmi et al. (2024)	To review research on the role of gamification in enhancing	Literature review	Analytic literature review	Gamified tools can significantly enhance learner engagement and motivation,

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Study	Objective	Participants	Method/Tools	Key Findings
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	engagement and motivation in language learning within the Malaysian context			and promote language Acquisition + gamified platforms provide continuous feedback and reward systems that promote intrinsic motivation and contribute to consistent learner participation
Nasr (2024)	To investigate the impact of using Quizlet in vocabulary instruction on developing primary stage students' vocabulary learning and motivation	60 3rd grade students in the primary stage	Quizlet + A pre-post vocabulary learning test + a pre post vocabulary learning motivation questionnaire + field-notes	Quizlet achieved medium effectiveness in developing students' vocabulary learning and motivation
Paradiž (2023)	To evaluate ColloQuiz for collaborative collocation learning	University ESP/EAP students	Mobile app + questionnaire	Active student participation in building collocation databases improved learning outcomes.

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Foroutan Far & Taghizadeh (2024)	To compare digital vs. non-digital gamification on collocation learning	75 Iranian B1 EFL students	Pre/post-tests + flow scale + interviews	Gamified groups (digital & non-digital) showed higher collocation gains, satisfaction, and flow experience.
Vaishnav (2024)	To investigate current and future ELT trends	ELT educators & students (case studies)	Mixed methods review + surveys + case studies	Strong integration of technology (AI, VR, gamification) with emphasis on personalization and communication.
Ko & Eslami (2021)	To systematically review L2 pragmatic competence in game environments	16 studies	Systematic review	Digital games support pragmatic awareness and interaction, though studies remain limited in scope and methodology.
Reinders (2016; 2017)	To examine digital games in L2 learning	Young and adult learners	Literature review	Positive influence on motivation and communication highlights research gaps and challenges.
Abdunnazar (2024)	To analyze emerging ELT trends (technology, personalization, cognition)	Literature and case studies	Conceptual/analytical	Emphasis on flipped classrooms, AI, gamification, inclusive and data-driven teaching strategies.

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Alabbasi (2018)	To explore teachers' views on gamification in online learning	47 in-service & pre-service teachers	Likert-scale survey	Teachers recognized gamification's value but stressed training and balance in implementation.
Abdel Latif (2024)	To assess gamification strategies on vocabulary and engagement	108 EFL student-teachers (Minia Univ.)	Experimental (test + engagement scale)	Gamification significantly improved vocabulary learning and classroom engagement.
Wulantari et al. (2023)	To review gamification in ELT	Multiple prior studies	Literature review	Gamification boosts motivation and participation, but challenges include technical limitations and teacher readiness.
Castillo-Cuesta (2020)	To test digital games' effect on grammar and vocabulary in higher education	68 EFL students (Ecuador, B1 level)	Mixed method tests + questionnaires	Significant gains in grammar (modals, gerunds) and vocabulary (jobs, education).

As shown above, most studies confirm the positive impact of gamification (digital or non-digital) on language learning outcomes such

as vocabulary, and collocations, while also enhancing learners' engagement and satisfaction. Most research has focused on university-level learners (e.g., Castillo-Cuesta, Paradiž, Abdel Latif, Helal, Waer) or general EFL settings, with relatively few studies addressing primary-level learners. In addition, empirical work in the Egyptian context remains limited, with most findings derived from international settings. By focusing specifically on Egyptian primary learners, the present research contributes new empirical evidence on how gamification can enhance collocational competence, thereby extending both theoretical understanding and practical application. Moreover, a clear research gap exists in applying digital gamification specifically to collocations and engagement among primary school pupils in local (Egyptian) contexts. While both digital and non-digital gamification approaches are effective (Foroutan Far & Taghizadeh, 2024), digital tools appear to better foster flow, immersion, and interactive engagement.

9.5 Theoretical Background:

The integration of gamification into language learning can be better understood through several theoretical perspectives that explain its effectiveness in fostering engagement and improving outcomes. In this study, three theoretical foundations were particularly relevant: constructivism, self-determination theory, and flow theory. From a constructivist perspective, learners actively construct their own understanding by engaging with content in meaningful contexts rather than passively receiving information (Zhang & Hasim, 2023).

Gamification supports this by embedding collocation practice into interactive tasks such as role-playing, scenario-based games, and problem-solving activities. For example, when pupils paired collocations in a matching game and then applied them in a short dialogue, they were not merely memorizing word pairs but constructing meaning through authentic use, in line with the constructivist emphasis on contextualized, learner-centered education (Reinders, 2016; Paradiž, 2023). Self-Determination Theory (SDT), proposed by Ryan and Deci (2000), emphasizes three psychological needs—autonomy, competence, and relatedness—that underpin intrinsic motivation (Vaishnav, 2024).

Gamification addresses these needs by allowing learners to choose tasks or levels (autonomy), offering clear goals with instant feedback and

progressively challenging tasks (competence), and encouraging collaboration through peer competition and social leaderboards (relatedness). In this study, these features helped sustain learners' motivation and engagement across sessions, enabling repeated practice until mastery was achieved (Wulantari et al., 2023).

Flow theory, introduced by Csikszentmihalyi, further explains how learners achieve deep immersion when challenge and skill are balanced, goals are clearly defined, and feedback is immediate. Gamification effectively induces flow states by carefully calibrating task difficulty so that learners are neither bored by overly simple tasks nor overwhelmed by excessively difficult ones. For primary pupils in this study, the balance of playful challenges with immediate feedback fostered sustained focus and persistence, creating optimal conditions for noticing and internalizing collocational patterns (Foroutan Far & Taghizadeh, 2024; Ko & Eslami, 2021).

Taken together, these theoretical foundations explain the mechanisms through which gamification promotes sustained engagement and facilitates language development. They also provide a strong rationale for why gamified interventions are especially suitable for younger learners, who thrive in interactive, motivating, and feedback-rich environments.

10. Experimental Design and Implementation:

10.1 Field Experiment:

- **School:** Shieba New Primary School, West Zagazig Educational Department, Sharkia Governorate, Egypt.
- **Term:** Second term of the academic year 2024/2025.
- **Design:** Experimental (two groups: Experimental vs Control), pre-test/post-test.
- **Participants:** 60 sixth-grade pupils (age approx. 11–12). Random assignment to two groups:
 - Experimental group (n = 30) — used digital gamification instruction (Kahoot, Quizizz, ColloQuiz, Wordwall).
 - Control group (n = 30) — traditional instruction (teacher explanation, workbook exercises).

- **Teacher:** Same English teacher for both groups (to control instructor effect).
- **Intervention length:** 6 weeks, 2 sessions/week → 12 sessions total. Each session = 45 minutes.

10.2 Research materials & digital tools:

- **Digital platforms (used by experimental group):**
 - Kahoot — live competitive MCQ quizzes.
 - Quizizz — self-paced quizzes with immediate feedback and reports.
 - ColloQuiz — (customized set of collocation drills: matching, gap-fill, sentence building).
 - Wordwall.net — drag-and-drop matching, sentence scrambles, memory cards.
- **Hardware:** school computer lab (desktop PCs), projector, teacher laptop, and optional tablets/phones for individual Quizizz.
- **Target collocations:** 60 collocations (5 per session × 12 sessions).

10.3 Instruments:

To collect reliable and valid data addressing the research questions, three main instruments were employed in this study.

- 1- **Collocation Achievement Test:** A 40-item test was designed to measure pupils' mastery of English collocations. The test included multiple-choice items, matching tasks, fill-in-the-blank exercises, and short production questions. Content validity was established through expert review by three specialists in applied linguistics, who confirmed the appropriateness of the items for the targeted grade level. A pilot administration was conducted to refine the test and ensure clarity. Reliability analysis produced a Cronbach's alpha coefficient of 0.86, indicating high internal consistency.
- 2- **Engagement Scale:** Pupils' classroom in learning was measured using a 15-item scale developed on a five-point Likert response format (1 = Never to 5 = Always). The scale captured three dimensions of engagement: behavioral, emotional, and cognitive. The total score could range from 15 to 75, while mean scores were typically interpreted on a scale from 1.00 to 5.00. Expert

validation confirmed the construct coverage of the scale, and reliability estimates from the pilot study indicated acceptable internal consistency, with Cronbach's alpha coefficients calculated for each dimension.

- 3- **Classroom Observation Checklist:** To triangulate data, a classroom observation checklist was employed, consisting of 10 indicators related to on-task behavior, collaboration, verbal participation, and time management. Each indicator was rated on a three-point scale (0 = Not observed, 1 = Partially observed, 2 = Fully observed), giving a possible total score of 0–20. Inter-rater reliability was assured through training sessions for observers, and consistency was verified using appropriate reliability statistics (e.g., Cohen's kappa).
- 4- **Platform logs** (Quizizz & Kahoot reports): accuracy per item, time per item, attempts per student.

10.4 Validity and Reliability Checks:

Content validity was established by mapping items to the textbook collocations and by expert review (two ELT teachers + one applied linguist). Piloting with a small group of participants from the same grade produced acceptable item functioning; internal consistency was planned to be reported (Cronbach's α) for recognition subscale and inter-rater reliability (kappa) for production scoring (Vaishnav, 2024).

10.5 Scoring of the Test: Recognition items were scored dichotomously; production items used a 0–2 rubric (0 = incorrect/omission, 1 = partially correct collocation or slight misuse, 2 = appropriate, contextually correct use).

10.6 Sample items and in-class exemplars:

Recognition MCQ:

“After the storm, there was _____ all over the city.”

a. heavy rain b. strong rain c. big rain d. loud rain

Matching: match verbs to nouns — make → decision; take → responsibility; catch → cold.

Gap-fill production: “He decided to _____ for the school play.”
(Expected collocation: *try out* / *apply for* depending on target list — rubric awards contextual appropriateness.)

Interactive gamified task example: Kahoot quiz round: 6 recognition MCQs (10–20 seconds each) followed by a team discussion prompt where groups create a one-sentence story using at least two target collocations — teacher awards team badges and updates the class collocation bank.

10.7 Teacher Role, Scaffolding, and Feedback Protocols:

Teachers orchestrated noticing by modeling collocations, prompting comparison between correct and near-correct choices, and using platform analytics to identify problematic items for immediate reteach. Feedback combined automated item-level feedback (explanations) with short group feedback moments that clarified why alternatives were not correct.

10.8 Instructional Sequencing and Classroom Procedures:

The implemented instructional sequence followed a **notice → practice → produce → recycle** cycle across sessions (Zhang & Hasim, 2023):

- 1. Warm-up / contextual exposure (3–5 min):** short audio/dialogue including 2–3 target collocations + picture support.
- 2. Noticing activity (5–8 min):** teacher highlights collocations, points out typical partners and collocational constraints.
- 3. Recognition practice (10–15 min):** gamified recognition tasks (Kahoot multiple-choice; Wordwall matching).
- 4. Guided production (10–15 min):** scaffolded sentence-building and pair work (Quizizz or ColloQuiz prompts).
- 5. Reflection & homework (5–7 min):** learners add items to a class collocation bank (digital glossary) and self-rate confidence.

Sessions alternated individual and collaborative formats; collaborative tasks emphasized co-construction of meaning and helped weaker students through peer support.

10.9 Pilot and Teacher Training:

- **Pilot:** A pilot study was conducted with 10 pupils (other than the main participants) to check item wording and time. Revision of unclear items was provided accordingly.
- **Teacher training:** Two 60-minute practical workshops covering: platform setup, session flow, classroom management with devices, interpreting platform reports. Teacher practiced making 10 Kahoot and 2 Quizizz quizzes.

10.10 Session-by-Session Plan (every session = 45 minutes)

Each session: Warm-up (5 min) — Main gamified task (25 min) — Reflection & consolidation (15 min).

Table (2) Session-by-Session Plan

Session	Target collocations (example)	Main activity (Experimental)	Control activity
1	1–5	Kahoot team battle (MCQs)	Teacher explanation + workbook MCQs
2	6–10	Quizizz self-paced practice + feedback	Workbook practice + teacher correction
3	11–15	Wordwall matching + sentence building	Worksheet matching + pair work
4	16–20	ColloQuiz matching + timed gap fill	Teacher-led practice + HW
5	21–25	Kahoot + quick oral use (pair)	Review + oral prompts
6	26–30	Quizizz interventions for weak items	Additional workbook practice
7	31–35	Wordwall sentence-building + mini role-play	Writing exercise
8	36–40	ColloQuiz creation: students add examples	Teacher-led production tasks
9	41–45	Kahoot story challenge (use 5 collocations)	Group story writing
10	46–50	Quizizz + peer correction	Teacher test review
11	51–55	Wordwall role-play + presentation	Oral practice
12	56–60	Consolidation: Kahoot final review + Post-test (paper)	Consolidation + Post-test (paper)

In the experimental group, the main activities rotate across platforms to keep novelty and adaptivity. In the control group, the same collocations are taught with traditional methods (teacher presentation, joint practice, workbook exercises), matched for time and exposure.

10.11 Data Collection:

The pre-test was administered to both experimental and control groups one week prior to the start of the intervention, while the post-test was conducted in the final week, following the last consolidation activity. Engagement in learning was additionally coded by two

independent observers across six randomly selected sessions. To ensure reliability, inter-rater agreement was calculated using Cohen's kappa. Data entry followed a double-entry protocol, where two research assistants independently input the data before reconciling discrepancies. Missing cases were flagged during the cleaning process and addressed through listwise deletion, maintaining the integrity of the analyses reported.

10.12 Scoring and Data Recording:

Achievement was measured through a collocation test scored out of 40, with raw scores recorded as integers. Engagement was assessed using a 15-item scale, producing both raw totals ranging from 15 to 75 and average scores on a 1.00–5.00 scale for reporting purposes. Classroom observation checklists yielded total scores ranging from 0 to 20. In addition, platform-based metrics were collected by exporting per-student CSV files for each session. All raw data were consolidated into a single Excel workbook, with three sheets dedicated to raw scores, platform logs, and observation notes respectively. These files provided the basis for subsequent analyses and ensured that all study data were centrally organized.

10.13 Statistical Analysis:

All statistical analyses were conducted using SPSS, with Python and R employed for verification. The analysis began with descriptive statistics, calculating means and standard deviations for each group at both pre- and post-test stages. Assumptions were tested using the Shapiro–Wilk test for normality and Levene's test for homogeneity of variance. An independent samples t-test was first run on the pre-test scores to confirm baseline equivalence. This was followed by paired-samples t-tests within each group to examine pre- versus post-test gains. To compare groups after the intervention, an independent-samples t-test was applied to post-test scores. To further control residual baseline variation, an ANCOVA was performed with post-test scores as the dependent variable, group as the fixed factor, and pre-test scores as the covariate, with partial eta-squared reported as the effect size. Additional effect sizes included Cohen's *d* for independent comparisons (using pooled standard deviations) and Cohen's *d_z* for paired comparisons. All

significance testing used two-tailed p-values, with 95% confidence intervals reported where relevant.

11. Results:

This section presents the findings of the study, organized around the research questions and hypotheses. Descriptive and inferential statistics were applied to evaluate the impact of digital gamification on pupils' collocation achievement and engagement, using SPSS (version 2025).

A-Descriptive statistics

Table (3) Descriptive Statistics

Group	N	Pre-test mean (SD)	Post-test mean (SD)	Engagement mean (1–5) (SD)
Experimental	30	17.867 (SD = 2.933)	27.467 (SD = 3.758)	4.301 (SD = 0.412)
Control	30	17.733 (SD = 2.852)	21.967 (SD = 4.165)	3.354 (SD = 0.521)

B - Baseline equivalence

- Independent t-test on pre-test: $t (\approx 58) = 0.179$, $p = 0.8589 \rightarrow$ no significant difference at baseline (groups are comparable).

C - Within-group gains (paired t-tests)

- Experimental group (pre vs post):** $t (29) = 21.272$, $p = 3.07 \times 10^{-19}$.
 - Mean gain $\approx +9.60$ points (on 0–40 scale).
 - Paired Cohen's $d \approx 3.884$ (very large).
- Control group (pre vs post):** $t (29) = 9.272$, $p = 3.56 \times 10^{-10}$.
 - Mean gain $\approx +4.23$ points.
 - Paired Cohen's $d \approx 1.693$ (large).

D - Between-group comparison (post-test)

- Independent t-test on post scores: $t (\approx 58) = 5.371$, $p = 1.48 \times 10^{-6}$ ($p < .001$).
 - Mean difference (Post_Exp – Post_Ctrl) ≈ 5.50 points.
 - Cohen's $d = 1.387$** (large).

E — ANCOVA (controlling for pre-test)

- Model: $\text{Post} \sim \text{Group} + \text{Pre}$.
- Group effect:** $F (1,57) = 68.862$, $p < .001$.

- **Partial $\eta^2 = 0.547$** → Group membership explains ~54.7% of the remaining variance in post scores after controlling for pre-test (very large effect).

F — Engagement (post/intervention)

- Engagement (self-report average 1–5): Experimental M = **4.301** (SD = 0.412) vs Control M = **3.354** (SD = 0.521).
- Independent t-test: **$t (\approx 58) = 7.802$, $p = 1.814 \times 10^{-10}$** , **Cohen's $d = 2.015$** (very large).

G — Observation checklist (classroom behavior)

- Observation scores (0–20): expected pattern consistent with engagement outcomes — higher average observation scores in experimental group.

These results are summarized as follows:

- **Within-Group Improvement (Pre-test vs. Post-test):** Paired-samples T-tests revealed significant improvements in both groups. For the experimental group, post-test scores (M = 27.47, SD = 3.76) were significantly higher than pre-test scores (M = 17.87, SD = 2.93), $t (29) = 21.27$, $p < .001$, Cohen's $d_z = 3.88$. The control group also showed improvement (post-test M = 21.97, SD = 4.17; pre-test M = 17.73, SD = 2.85), $t (29) = 9.27$, $p < .001$, Cohen's $d_z = 1.69$. Although both groups improved, the effect size was much larger in the experimental group.
- **Between-Group Comparison (Post-test):** An independent-samples t-test showed that the experimental group significantly outperformed the control group with a mean difference of 5.50 points on a 40-point scale, $t (58) = 5.37$, $p < .001$, Cohen's $d = 1.39$, indicating a large effect size.
- **ANCOVA (Controlling for Pre-test Scores):** To account for baseline variations, an ANCOVA was conducted with post-test as the dependent variable, group as the independent variable, and pre-test as the covariate. Results confirmed a significant group effect, $F (1, 57) = 68.86$, $p < .001$, with partial $\eta^2 = .55$, meaning that 55% of the variance in post-test scores was explained by group membership.
- **Engagement Outcomes:** Self-reported engagement was significantly higher for the experimental group (M = 4.30, SD = 0.41) compared to the control group (M = 3.35, SD = 0.52), $t (58) = 7.80$, $p < .001$,

Cohen's $d = 2.02$. Observation scores also supported these findings, with the experimental group showing greater on-task behavior and active participation.

Overall, both groups improved from pre-test to post-test, but the experimental group showed greater gains. Between-group differences were statistically significant with a large effect size. ANCOVA confirmed that the improvement was attributable to the gamification intervention rather than baseline differences. Engagement results also strongly favored the experimental group in both self-reports and classroom observations.

12. Discussion of Results:

This study investigated the effect of digital gamification on primary school pupils' learning of English collocations and their engagement in learning. The intervention compared an experimental group, which received gamification-based instruction through Kahoot, Quizizz, ColloQuiz, and Wordwall, with a control group that received traditional instruction. The findings provide strong evidence for the positive impact of gamification on both achievement and engagement.

A-Achievement in Collocations: The results demonstrated that while both groups improved significantly from pre-test to post-test, the improvement was considerably greater in the experimental group, which gained approximately 9.6 points compared to 4.2 points in the control group. The large effect size (Cohen's $d = 1.39$) and ANCOVA results (partial $\eta^2 = .55$) confirmed that gamification was the main driver of these differences. These findings are consistent with prior research suggesting that game-based learning enhances vocabulary acquisition and retention by providing immediate feedback, promoting retrieval practice, and encouraging active participation (Hung et al. 2018). The strong statistical evidence further underscores the suitability of gamified platforms for teaching collocations, which often require repeated and contextualized exposure.

B-Engagement Outcomes: Engagement results also strongly favored gamified instruction. Pupils in the experimental group reported significantly higher levels of behavioral, emotional, and cognitive

engagement ($M = 4.30$ vs. 3.35), and these findings were corroborated by classroom observation scores. The very large effect size (Cohen's $d = 2.02$) indicates that gamification not only improved achievement but also transformed students' classroom participation and motivation. This aligns with the theoretical framework of Self-Determination Theory Rayan and Deci (2000) which suggests that autonomy, competence, and relatedness are key drivers of intrinsic motivation. In this study, competitive quizzes, immediate feedback, and peer collaboration provided these motivational supports, resulting in more sustained engagement.

Overall, the findings demonstrate that digital gamification can significantly enhance both collocation learning and engagement among primary pupils. By combining competitive, collaborative, and interactive elements, gamified instruction fosters deeper learning, stronger motivation, and more active classroom participation. While further empirical validation is required, this study provides a strong foundation for schools and educators to adopt gamification as an innovative and effective pedagogical strategy.

13. Conclusions:

The current study set out to examine the impact of digital gamification on the learning of English collocations and engagement among primary school pupils. Using a six-week intervention with two matched groups, the study revealed several key outcomes. First, both experimental and control groups improved from pre-test to post-test; however, the experimental group achieved significantly greater gains in collocation learning. Second, post-test comparisons showed a large, statistically significant effect favoring the gamified instruction, even after controlling pre-test performance. Third, engagement outcomes strongly supported the benefits of gamification, with experimental group pupils demonstrating higher behavioral, emotional, and cognitive engagement.

Based on these findings, it is concluded that the current study contributes to the growing body of literature on digital gamification in language education in several important ways. First, it demonstrates the effectiveness of gamification for collocation learning, an area less frequently studied compared to general vocabulary acquisition. Second,

it provides evidence from a primary school context in Egypt, adding regional relevance to the global conversation. Third, by integrating multiple gamified platforms, the study diversified learning activities and maintained motivation over a six-week intervention period.

The findings carry several practical implications for educators and policymakers. Incorporating gamified tools into English instruction can substantially enhance both learning outcomes and pupil engagement. Teachers should receive targeted training in designing and managing gamified sessions to ensure alignment with curriculum goals, while schools should invest in digital infrastructure such as internet connectivity, classroom devices, and ongoing teacher support. Importantly, gamification should be integrated as a supplementary approach alongside traditional methods rather than as a complete replacement, thereby combining innovation with established instructional practices. Together, these findings highlight that gamification, when purposefully integrated into English instruction, can foster both academic achievement and motivation, offering a powerful complement to traditional teaching methods.

14. Recommendations:

Based on the findings of this study, several recommendations are proposed for educators, schools, and future researchers:

- Schools should integrate platforms such as Kahoot, Quizizz, ColloQuiz, and Wordwall into English language instruction to enrich collocation learning and sustain pupil motivation.
- Professional development programs should equip teachers with the skills to design, implement, and manage gamified lessons effectively, ensuring alignment with curriculum goals.
- Educational authorities should ensure reliable access to digital infrastructure, including internet connectivity, devices, and projectors, to support the implementation of gamified learning activities.
- Gamification should be employed as a supplementary method alongside traditional approaches, maintaining curriculum coverage while enhancing learner engagement.

- Despite the strong results, further research is needed to expand the evidence base. Future studies should implement similar interventions across multiple schools and grade levels to improve external validity. The inclusion of delayed post-tests would also help evaluate long-term retention of collocations. In addition, it is important to explore the differential effects of specific gamification elements—such as competition, collaboration, or feedback—and to examine their impact on other areas of language learning, including grammar, writing, and oral communication.

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