# Enhancing Vocabulary Mastery through Digital Games

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## ABSTRACT

Today, most primary ESL students are experiencing difficulties trying to learn the vocabulary because of the traditional rote learning practice, which in most cases leads to low motivation and poor retention. The paper dwells on the ways to use digital escape rooms (developed with Genially) in order to enhance vocabulary acquisition among primary ESL students. Qualitative design was embraced where quantitative observations in two target classrooms were conducted; purposive sampling was employed, where ten participants were chosen in two Malaysian primary schools. Students of both lower and upper primary ESL classes were introduced to vocabulary-based digital escape rooms that were expected to encourage active learning with gamified activities and collaborative problem-solving. The findings were that both groups demonstrated great involvement of students and motivation. It was shown that the majority of the participants showed the improvement of focus, active participation, and application of newly learned vocabulary in effective situations. Remarkably, the learners experienced the interactive and immersive property of the escape rooms and indicated that it positively contributed to improving their vocabulary and confidence. The results indicate that Google-based digital escape rooms built in a Genially framework will help higher learning engagement, autonomy as well as language acquisition among pupils in primary schools.

**Keywords:** *Digital Escape Rooms, Genially, Vocabulary Mastery, ESL, Primary Education*

## INTRODUCTION

Vocabulary is the key to language skills and plays a crucial role in developing communicative competence among young English as Second Language (ESL) learners, as emphasized by studies examining vocabulary acquisition strategies and their impact on language proficiency (Dan et al., 2025; Ramasamy et al., 2025). Vocabulary mastery positively influences reading comprehension, articulate expression, and meaningful engagement in classroom discourse in the Malaysian primary school context (Subon & Unin, 2023; Nawaz et al., 2025). Nevertheless, vocabulary retention and use continue to be one of the major struggles of many primary students because of the use of conventional teaching approaches like rote memorisation (Ramasamy et al., 2025; Nawaz et al., 2025). These strategies focus on the use of isolated word lists instead of interactive contextualized learning, which leads to low motivation and disengagement that impede long-term vocabulary acquisition (Kamisah et al., 2023; Nawaz et al., 2025).

Recent research has indicated that digital pedagogies such as mobile learning and game-based learning have a substantial positive impact on vocabulary acquisition because they offer a more interactive and engaging learning experience (Dan et al., 2025). Multimodal input and active engagement through digital tools make it easier to engage in deeper cognitive processes and emotional involvement in vocabulary learning (Zhou and Zhou, 2025; Kamisah et al., 2023). Colour-blind Game based learning practices encourage active vocabulary application in contexts of meaningfulness, and a step beyond the mechanical repetition (Dan et al., 2025; Ramasamy, 2025).

Digital escape rooms, which use gamification and problem-solving activities, have been suggested as a means of vocabulary learning because they prompt students to use vocabulary knowledge in immersive, narrative-based situations (Subon & Unin, 2023). Computer-generated tools such as Genially offer the freedom and multimedia which is essential to develop such interactive vocabulary quizzes, which enhance user engagement and thinking (Subon & Unin, 2023).

Although the success of digital games as language learning tools is firmly supported, empirical studies that explicitly investigate Genially-based digital escape rooms as vocabulary acquisition in Malaysian primary ESL classrooms are scarce but promising (Dan et al., 2025; Subon & Unin, 2023). It has been observed that conventional memorisation of vocabulary results in a lack of engagement and superficial memorisation, and more interactive approaches to teaching vocabulary need to be considered more meaningful (Kamisah et al., 2023; Nawaz et al., 2025). The combination of Genially escape-room vocabulary games with curriculum tasks has the potential to promote the use of vocabulary and motivation to use it actively (Subon & Unin, 2023).

Quantitative vocabulary tests and qualitative examinations of student engagement are effective approaches to action research to determine the effects of digital escape-room interventions (Dan et al., 2025; Nawaz et al., 2025). The objective of the present study is to identify the extent of vocabulary mastery and collaboration and authentic language use facilitation among young learners in the Malaysian ESL settings through Genially escape rooms (Subon & Unin, 2023; Dan et al., 2025).

To achieve this purpose, the research is guided by the following questions:

1. How do digital online games influence vocabulary mastery among primary ESL learners?
2. In what ways do digital online games affect pupils' engagement and motivation in vocabulary learning?

The research results will help to inform the teachers, curriculum developers and educational practitioners interested in finding new ways of teaching vocabulary. Placing the learning process in the context of interactive challenges, the Genially escape rooms can become a possible solution to the long-standing problem of vocabulary retention and motivation among primary ESL-based learners. Also, the study contributes to the scope of scarce empirical evidence on digital escape-room pedagogy in Malaysian primary education, as it has the potential to be a revolutionary means of teaching and learning ESL in the 21st century.

Finally, this action research is an evaluative and reflective venture. Not only does it evaluate the effect of Genially escape room use on vocabulary achievement but also contributes further to my professional knowledge of how digital game-based learning can be strategically incorporated to improve language instruction. This study will enable me to promote pedagogical practices that will support empowerment of learners, foster curiosity and enhance meaningful classroom participation on the English language at the primary level.

## LITREATURE REVIEW

### *A. Vocabulary Acquisition in Primary ESL Contexts*

The vocabulary is one of the crucial components of the general language development, because it is the basis of the skill of listening, speaking, reading, and writing in the learners. The good vocabulary base is directly linked to academic achievement, especially in the second language acquisition environment (Nation, 2022). This is because of the fact that in primary ESL classrooms in Malaysia, learners are normally exposed to very little English outside the classroom. Consequently, vocabulary teaching cannot be based entirely on memorisation but should be aimed at offering the repetitive and meaningful exposure of target words in contextualised learning activities.

Studies have always emphasized both breadth and depth of vocabulary as significant in the attainment of effective vocabulary mastery. Breadth is the number of words that are in the knowledge of learners, whereas depth is the level of knowing these words in detail, their meaning, forms, and proper use (Nation, 2022). Students thus should be given chances to be exposed to vocabulary in different situations and they should also be given chances to manipulate words through meaningful language processing. Instructional strategies encouraging repetitive and contextualised work with vocabulary have been reported to improve the retention and learning transfer (Nation, 2022; Mayer and Fiorella, 2022).

Theoretically, the Depth of Processing Theory has been used to support vocabulary learning whereby lexical items have a higher probability of being retained when the learners subject them to deep processing by

engaging in meaningful thought processes rather than being subjected to superficial exposure. Activities that involve vocabulary analysis, application and reuse of vocabulary encourage better memory traces and long-term memory (Nation, 2022). The current perception is also in line with Involvement Load Hypothesis which predicts that vocabulary acquisition is enhanced when learning tasks require greater degree of cognitive and motivational involvement (Liu & Reynolds, 2022).

Nevertheless, in many primary grade ESL classrooms, the teaching of vocabulary has been characterized by the traditional vocabulary teaching methods like isolated word list, drilling and single exposure teaching frameworks. They can justify the short-term recall, but in most cases result in shallow processing and poor long-term retention (Mohd Tahir et al., 2023). In reaction, the modern-day pedagogical methods have started to promote the idea of multimodal, task-oriented and socially interactive learning of vocabulary. These strategies promote the active interactions of the learners with the lexical items, cognitive processing, and meaningful use of language.

*B. Digital Game-Based Learning in Vocabulary Instruction*

The digital game-based learning has been receiving growing popularity as an effective method of teaching vocabulary to young ESL learners. Digital learning games are interactive platforms, and learners are able to work with the language by means of challenges, feedback, and goal-related assignments. According to previous research, digital game-based learning positively influences the motivation, engagement, and chronic involvement of learners, which is essential in vocabulary learning (Prastiwi and Lestari, 2025).

Cognitively, the digital games aid the study of vocabulary because they introduce the information in a multi-modal manner, such as visual, audio, and textual content. This strategy is consistent with the Cognitive Theory of Multimedia Learning, which states that learners process information better when that input is accompanied by visual and other interactive elements, which results in higher levels of understanding and better retention (Mayer, 2021). Digital games also promote repeated exposure and retrieve practice, which are critical processes in enhancing the memory as well as long term vocabulary conservation.

Moreover, digital games are supported by the principles of Game-Based Learning Theory which acknowledges the importance of challenge, instant feedback and clarity of goals in maintaining learner motivation and encouraging active participation. Games purposefully designed to support learning goals can be used to promote meaningful use of a language and reinforce the learning outcomes in vocabulary (Kumar & Hashim, 2024).

Nevertheless, current studies also warn that the success of digital games relies on the instructional design to a great extent. Games that are not well aligned to learning outcomes or even those that are more geared towards entertainment might not yield significant learning benefits. Thus, the pedagogical role of the teacher is essential in ensuring that digital games are applied purposefully as components of vocabulary instruction, rather than being used as isolated practice activities, as this strengthens learners' memory and long-term retention (Liu & Reynolds, 2022).

However, studies point out that the success of the digital games is heavily pegged on the instructional design. Closely aligned games, which are scaffolded in a way that they are appropriate, are likely to lead to meaningful learning outcomes. Games that are created in bad ways or games that are designed entirely on entertainment can fail to deliver the same advantages. Thus, teachers should be the ones to make sure that digital games are used in a purposeful way, as a part of vocabulary teaching.

Though there is common belief that digital game-based learning is accompanied by higher motivations, more engagement, and involvement of the learner, the available literature does not imply that it should be adopted without a second thought as an alternative to the traditional vocabulary teaching. Explicit instruction, repetition and form-based practice is still useful in teaching new vocabulary, especially of the abstract, low-frequency or decontextualised type. They have however been criticised as being shallow and other processes limiting transfer done in isolation.

This paper aligns Genially-based digital escape rooms with traditional instruction, rather than viewing it as an alternative to more effective teaching methods, the digital escape rooms would complement it by adding the aspect of depth of processing, application context, and socialization. In this respect, the current study fits with the integrative approaches in the research area that believe in integrating explicit teaching with task-based and experiential learning in order to promote accuracy and meaningful use. The research aimed at analyzing the empirical evidence related to escape-room pedagogy in an established primary ESL environment is a contribution to the current discourse on whether digital gamification can positively impact learning or is just a form of increased engagement, and it suggests evidence that well-planned gamified activities can help in both motivational and cognitive aspects of vocabulary learning (Nation, 2022; Dan et al., 2025).

### *C. Digital Escape Rooms in Language Learning*

Digital escape rooms are a particular type of digital game-based learning that incorporates problem-solving, narrative, and interactive communication. Digital escape rooms in the context of education have the learners solve a series of tasks or puzzles to advance through a storyline, which may involve the meaningful use of subject knowledge including vocabulary.

According to the recent studies, digital escape rooms have the potential to contribute greatly to the engagement of learners, their motivation, and learning outcomes. Escape rooms can be used in a language learning situation where it is important to teach learners to actively use the vocabulary by interpreting clues, solving puzzles, and negotiating meaning in the course of accomplishing tasks (Sánchez, 2023). The time and objective aspect of the escape rooms also makes learners more focused and persistent, which adds to the long-term interest involved in the activity.

Theoretically, the digital escape rooms are similar to the sociocultural approach to language learning attaching importance to social interaction and collective sense-making in language acquisition. Learners are usually organized in pairs or small groups and this provides them with a chance to engage in peer scaffolding, vocabulary explanation, and clarification (Morales and Castillo, 2024). Such a collaborative learning space enhances the learning of vocabulary through encouraging authentic language use and collaborative problem-solving that is vital in effective lexical processing and transferring learning.

### *D. Genially as a Tool to build Digital Escape Rooms.*

Genially is an online application that allows instructors to create interactive digital learning, such as digital escape rooms. It has multimedia capabilities including templates, animations, audio, video, and clickable items, which mean it, can be used by teachers who have more basic technical knowledge (Morales and Castillo, 2024). These affordances enable teachers to develop visually stimulating and interactive tasks on vocabulary that are appropriate to young learners.

These affordances enable the teacher to develop vocabulary tasks, which are visual and interactive, and are appropriate to the young learner. The empirical research concerning the utilization of Genially in education suggests that the tool can be used to promote the engagement of learners and their interest because of the interactive and multimedia-based design and structure (Putra and Afrina, 2023; Castillo-Cuesta et al., 2024). When teaching vocabulary, Genially allows the teacher to incorporate the target words in contextualised activities, including matching exercises, puzzles, and guessing something using clues. This method facilitates the repeated exposure and meaningful use of vocabulary which is very important in vocabulary development.

Pedagogically speaking, the escape rooms, which are created using Genially, correspond to the principles of constructivist learning since, instead of being presented with information passively, the learners actively build the knowledge by interacting with each other, exploring, and solving the challenges. Moreover, these practices demonstrate the concepts of the Task-Based Language Teaching as the learners are expected to apply vocabulary with a purpose to accomplish communicative tasks and attain particular results. Genially is also flexible, which is why teachers can adapt the level of difficulty of tasks, offer scaffolding, and create collaborative tasks based on the level of proficiency of learners, which is why it is an appropriate tool to use to implement digital-based escape-room-based vocabulary teaching in primary ESL classrooms.

# METHODOLOGY

*A. Research Design*

The research used an action research design as it was based on reflective teaching and systematic classroom inquiry (Kemmis, McTaggart and Nixon, 2014). Action research is defined by a cyclical process of planning, acting, observing, and reflecting cycle, which enables educators to be able to take interventions, and continuously assess their effects in the real time. These designs can be used extensively in the field of language education to meet instructional issues and enhance the classroom practices (Nopasari and Muarif, 2025).

Action researches was especially appropriate in this study since it allowed exploring the effectiveness of a Genially-based vocabulary game created as an escape-room, allowing the researcher to present an instructional innovation, track its execution, and measure its results and improve strategies according to the findings of this study. In addition, action research is frequently combined with quantitative and qualitative approaches, which makes it possible to have a holistic picture of learner's performance and classroom life (Oranga, 2025). Mixed methods research is especially useful in an educational setting, where it can be used to integrate numerical and interpretative data to enhance validity and offer more insightful information (Siregar, 2025).

*B. Research Context*

The research was carried out in a Malaysian primary school in an urban area based national curriculum focused on communicative competence, digital literacy and the learner-centred pedagogy. The vocabulary teaching method that was traditional was mostly based on rote learning and this hindered the learning process in the use of words in speaking and written works. Classroom action research has become quite relevant in the ESL context to explore the ways in which new teaching methods, such as the use of digital tools, can overcome such learning disjuncture's (Nopasari and Muarif, 2025). The availability of computer lab facilities and a good internet connection in the school provided a smooth transition of digital tools creating a real experience of a natural and least disruptive learning process.

*C. Participants*

A sample was purposely chosen to include six Year 2 ESL learners who are aged 8 as they can represent various levels of proficiency. All the participants did not speak English at home, and contact with English outside school was minimal. The reason is that the small and heterogeneous group enabled a delicate assessment of the intervention in diverse profiles of learners. Students were anonymised as well as parental consent and school permission were obtained. Action research literature in the classroom also underscores the suitability of small, context-oriented samples to facilitate an in-depth inquiry of the teaching interventions (Oranga, 2025).

The sample size (n = 6) is small, but is in line with the methodological orientation of classroom action research, which is more concerned with a depth of contextualised inquiry rather than statistical generalizability (Kemmis, McTaggart and Nixon, 2014). The selective use of a small, diverse team allowed close observation of personal learning processes, interaction with peers, and vocabulary, which can be used in situ, during the intervention. It would be hard to do in large-scale experimental designs, such fine-grained analysis.

However, the small-n design limits the extraneous validity of the results. The findings cannot be extrapolated to the external conditions of the research, and they can be conditioned by the cultural factors of the classroom, including the teacher interference, classroom atmosphere, and technological unfamiliarity. Additionally, the brief intervention duration does not allow drawing conclusions about long-term retention and transfer. These findings are therefore to be taken as exploratory and generate hypotheses and guide further major studies and not to make causal assertions.

*D. Instruments*

The vocabulary test consisted of nine items designed by a researcher based on the Year 2 syllabus that assessed recognition, comprehension and use of target vocabulary in the form of a picture-word matching test,

synonym identification test and contextualised multiple-choice test. The content validity and consistency with the learning objectives were guaranteed because of the review of two qualified English teachers. Moreover, learner interaction, cooperation and natural use of vocabulary were followed with the help of structured observation checklist with behavioural descriptors complemented with descriptive notes to facilitate real-time interactions in the classroom. The applications of structured observation as well as pre/post-tests are both long-standing techniques in action research to triangulate, as well as improve validity (Nopasari and Muarif, 2025).

### *E. Procedure*

The intervention was conducted in accordance with the action research cycle, which entailed planning, acting, observing, and reflecting in four lessons (two weeks). The design of the Genially digital escape-room was planned on nine target vocabulary items, based on which interactive puzzles, drag-and-drop tasks, matching activities, and multimedia components have been incorporated into the planning. The implementation process involved the learners taking the pre-test to identify the initial knowledge and participating in digital escape-room activities in pairs with less facilitation and taking the post-test. Throughout observational data were taken to document the interactions, cooperation, and the use of vocabulary. Online escape rooms are considered the high-quality innovative pedagogical tools that can facilitate motivation, group work, and engagement, which is why they would be an adequate intervention in this case (Makri, Vlachopoulos and Martina, 2021). Quantitative and qualitative data were then analysed to measure the learning outcomes and provide guidance to the reflective practice.

### *F. Ethical Considerations*

Ethics was highly enforced. The anonymity of the participants was ensured, parental consent and school approval pushed, and all their data were considered confidential information. The learning activities were developmentally suited, could be linked to the curriculum goals, and were not academically risky. The literature on classroom action research focuses on the ethical principles of research, particularly in cases where interventions among minors are the focus (Nopasari and Muarif, 2025).

## FINDINGS

This section presents the findings of the study, integrating quantitative data from pre-test and post-test scores with qualitative data from classroom observations during the Genially digital escape-room intervention. The aim is to examine the intervention's impact on learners' vocabulary mastery, engagement, collaboration, and authentic vocabulary use.

### *A. Pre-test and Post-test Results*

The primary quantitative objective was to determine the extent to which the Genially escape-room intervention enhanced learners' vocabulary mastery. **Table 1** summarises the scores of the six participants on the nine-item vocabulary test administered before and after the intervention.

TABLE 1 PRE-TEST AND POST-TEST SCORES OF SIX STUDENTS ALONG WITH THEIR GAIN SCORES.

| Student | Pre-test (9) | Post-test (9) | Gain |
|---|---|---|---|
| S1 | 4 | 8 | 4 |
| S2 | 5 | 8 | 3 |
| S3 | 6 | 9 | 3 |
| S4 | 3 | 7 | 4 |
| S5 | 5 | 9 | 4 |
| S6 | 4 | 8 | 4 |

Descriptive statistics summarizing learners' performance are as follows:

- Mean Pre-test Score: 4.5 / 9
- Mean Post-test Score: 8.2 / 9
- Mean Gain: 3.7
- Median Pre-test Score: 4.5 / 9
- Median Post-test Score: 8 / 9
- Range Pre-test: 3–6
- Range Post-test: 7–9

These statistics show that there are considerable and steady gains among the group of participants. The mean and median scores are also very close together which indicates that outliers did not affect the improvements in a skewed manner. The range also sheds light on the fact that learners at all initial levels of their proficiency were able to benefit, with lower-achieving students, including S4, demonstrating a strong change in this direction.

The mean increase of 3.7 points represents a 41 percent improvement in the total vocabulary performance, so one can believe that the intervention made both the receptive and the productive vocabulary skills quite better. The findings are consistent with the research that showed that digital game-based learning strategies, such as escape-room assignments, offer repeated and context-based exposure to target vocabulary, engagement, and retention among learners (Makri, Vlachopoulos, and Martina, 2021; Yieng & Abdul Aziz, 2022).

Furthermore, the equalized success among participants imply that the Genially digital escape-room intervention was effective despite the initial proficiency level, which points to previous data that interactive, gamified tasks assist in scaffolding learning in learners of lower and intermediate stages (Nation, 2022; Kumar & Hashim, 2024). It seems that vocabulary acquisition and motivation and confidence towards using new vocabulary has been solidified by a combination of immediate feedback, problem-solving and contextualisation of the application.

Finally, the pre-test and post-test findings show that the intervention positively influenced the vocabulary knowledge of learners, which has a solid quantitative basis to interpret the influence of digital escape-room activities in primary ESL classrooms.

*B. Observation Checklist findings*

TABLE 2 OBSERVATION CHECKLIST FINDINGS ON PUPILS' ENGAGEMENT AND VOCABULARY APPLICATION.

| **Aspect Observed** | **Average Score (Max 12)** | **Indicators** | **Remarks** |
|---|---|---|---|
| Engagement & Focus | 10.5 | Stayed on task, showed interest, followed instructions | Pupils showed excitement, stayed on task, minimal distraction. |
| Collaboration | 10 | Helped peers, discussed answers, shared decisions | Pupils worked in pairs, shared clues, encouraged peers. |
| Vocabulary Use | 9.5 | Used target words, matched meanings, explained words | Pupils used target words naturally during discussion. |
| **Overall** | **30 / 36** | — | Highly engaged class with active vocabulary application. |

Table 2 shows the Observation Checklist findings on pupils' engagement and vocabulary application during the Genially digital escape-room intervention. All the scores were high, as the intervention was effective and encouraged engagement, collaboration, and the use of real words.

The scores of the Observation Checklist (Table 2) have shown that the results were high in all the dimensions measured, which means that the Genially digital escape-room intervention was very successful at fostering engagement, collaboration, and related use of authentic vocabulary. The average score of the learners in Engagement and Focus was 10.5/12, indicating that the digital type of the escape-room was effective in maintaining attention during the lessons. As observed, pupils were keen on starting every activity and showed enthusiasm when faced with difficulties and showed ongoing focus even when engaging in complicated puzzles. This degree of involvement correlates with the findings of studies that have shown that gamified learning experiences increase the situational interest, intrinsic motivation, and task persistence (Kumar & Hashim, 2024; Makri, Vlachopoulos and Martina, 2021).

The Collaboration dimension was also rated rather high, with the average of 10/12, indicating common level of peer-to-peer communication and mutual problem solving. Students engaged in active communication with each other in order to decode hints, confirm answers, and give each other directions by using vocabulary-based activities. An example is that students would discuss what they meant by target words like shiny or slippery when comparing vocabulary and contextual cues and they would scaffold classmates and agree on meaning. These findings are consistent with other researchers like Shafiee Rad et al. (2025) that state that collaborative gameplay in language learning promotes peer scaffolding, shared cognition, and when negotiating meaning, to exchange meaning, which are fundamental in successful vocabulary learning.

Regarding Vocabulary Use, the average of 9.5/12 was received, which means that the students were using the targeted vocabulary actively in meaningful situations. Pupils were able to verbalise words intuitively, equate meanings and interpret how to use words to each other and this demonstrates that the escape-room activities stimulated both receptive and productive vocabulary growth. The necessity to answer puzzles with the vocabulary provided the actual communicative chances, supporting the repetitive exposure and contextualised use. This confirms the statement made by Nation (2022) that the long-term retention process depends on repeated, meaningful interactions with vocabulary in context.

In general, the cumulative score of the class was 30/36, which showed a very active and cooperative learning atmosphere. The combination of interactive questions, narrative assignments, and instant feedback within the Genially escape-room seemed to promote cognitive activity, social interaction, and language use at the same time, which is corroborated by the existing studies on multimodal, gamified instruction in ESL learning (Yieng and Abdul Aziz, 2022). Interestingly, it was also noted that learners were self-correcting, motivating others and excited when they managed to solve tasks, which points to the growth of positive affective and motivational levels as well as linguistic achievements as the outcome of the intervention (Jabbari, 2025).

Evidence of authentic vocabulary use during the intervention was also supported by qualitative observations. The learners were not simply picking the correct answers but actively engaged in meaningful ways with target words. An example may be seen in a learner stating, as he looked at a visual card, "I want the red T-shirt," and another learner saying to someone, "These blue jeans are too big." In another case, a learner stated, "The skirt is yellow, it is bright," and it is observable that he or she was noticing and describing the properties of the objects when played with other peers. These statements suggest that the vocabulary was in active construction and negotiation by the learners, connecting words with actual referents in the real world. These qualitative observations are the ones, which strengthen the checklist results, as they give significant evidence that the intervention facilitated productive and context-related learning of vocabulary.

Summing up, the Observation Checklist findings explain that the digital escape-room learning not only helped to capture the interest of students and encourage teamwork but also gave them plenty of chances to engage in genuine and meaningful use of vocabulary, which confirmed the effectiveness of the latter in primary ESL classrooms.

# DISCUSSIONS

*A. Theoretical Foundations and Cognitive Mechanisms*

The Genially online escape-room intervention is strongly based on the existing theoretical frameworks explaining its effectiveness in mastering vocabulary. The most important of them is the Depth of Processing Theory that suggests that memory of lexicon is developed by contextual enactment and application rather than shallow rehearsal; here, participants needed to solve puzzles, which forced them to analyze target words in contextual storytelling and it is through this that the 41% mean increase in the lexicon and high rates of vocabulary use (9.5/12) was obtained. This intensive processing is enhanced by the Involvement Load Hypothesis, in which tasks had high evaluation and retention loads (e.g., drag-and-drop retrieval), that created enduring memory traces during negotiations under collaborative conditions as reflected in consistent gains at all levels of proficiency including low performer S4 (Liu and Reynolds, 2022). In addition to these cognitive processes, the Cognitive Theory of Multimedia Learning describes multimodal inputs, including visual animation, audio cues, and interactive text, which reduced extraneous memory requirements and maximized germane processing to achieve comprehension and transfer, in low-exposure ESL settings where traditional methods perform poorly (Mayer, 2024; Mayer and Fiorella, 2022). Moreover, the Game-Based Learning Theory emphasizes the role of narrative immersion, time limits, and feedback in ensuring the continuation of attention (10.5/12), turning passive memorization into active, goal-oriented practice that resembles actual communicative needs (Kumar and Hashim, 2024).

*B. Contextualization within Malaysian Primary ESL Ecologies*

Given the ESL context, which is characterised by limited out-of-class exposure to English and a reliance on rote learning, the intervention can help overcome entrenched barriers to deep and broad vocabulary acquisition. Consequently, the observed gains cannot be attributed solely to differences in learners' initial proficiency (Nation, 2022; Mohd Tahir et al., 2023).Peer scaffolding, or pupils giving clues and talking about target words, resonates with the principles of sociocultural, as students were taught to solve problems together in pairs, developing genuine language skills, and overcoming the tendency to lose interest in drills and focus on national programs that promote communicative proficiency and digital literacy (Morales and Castillo, 2024; Kamisah et al., 2023). This is supported by meta-analytical evidence: digital gamification provides better retention in environmentally limited contexts, with the flexibility of Genially to scaffold activities based on syllabi of Year 2 leading to uniform post-test reactions, with mean 8.2/9 scores, as a result of which individual difference limitations such as home language supremacy are circumvented (Dan et al., 2025; Subon & Unin, 2023; Nawaz et al., 2025). The presence of high collaboration ratings (10/12) also emphasizes the aspects of escape rooms in developing autonomy and motivation, alleviating superficial processing that is inherent in traditional Malaysian practices, and facilitating transfer to speaking and reading, according to systematic reviews on gamified ESL interventions (Prastiwi and Lestari, 2025; Shafiee Rad and Alipour, 2025).

C. Methodological Limitations, Scholarly Implications, and Research Trajectories

Although simultaneous convergence occurred due to the pre/post metrics and behavioral indexes, the epistemological rigors demand that the constraints are noted: the n=6 purposive cohort and compressed two weeks cycle will not allow ecological validity and longitudinal decay profiles, and the Hawthorne/novelty confounds may inflate the proximal impact without any maturation or randomized base-lines (Makri et al., 2021; Nopasari and Muarif, 2025). Action research performed by practitioners, although enhanced with the dual-instrument validation, contains confirmation biases; urban lab privileges are disconnecting rural-digital inequalities that are prevalent in Malaysian polities, whereas unparsed Genially affordances require disaggregation (Oranga, 2025; Siregar, 2025). In theory, the results are exhorting to retheorize vocabulary pedagogy in constructivist-task terms: teachers need to coordinate Genially escapes as curricular fulcrums, to make progress in stratified scaffolding to catalyse decontextualized transfers, according to empirical precedents (Sánchez, 2023; Aprianti et al., 2024). As institutions, pre-service Genially literacies advocacies, on the one hand, based on the affective dividends of interactivity such as peer-encouragement cascades, could trigger policy

shifts to EdTech equity (Putra and Afrina, 2023; Castillo-Cuesta et al., 2025). Next-generation multisite quasi-experiments in which Genially is compared to comparators, with delayed retention probes, neuroimaging proxies of processing depth, or intersectional lenses would measure scalability and persistent depth in global EFL spectra and cement escape rooms as an ontogenous paradigm in the 21st century (Zhou and Zhou, 2025).

## PEDAGOGICAL IMPLICATIONS

The results of this research have a number of practical implications on ESL practitioners who may want to use Genially-based escape rooms as a part of the vocabulary lessons. To begin with, regarding design, educators are expected to make sure that any escape-room activities are clearly aligned with curriculum vocabulary goals. The puzzles must involve the retrieval, application, or explanation of target lexical items by the learners, as opposed to recognising them. Simpler types of tasks like matching, sequencing, interpretation of clues, and contextual multiple choices work well with learners of a younger age and can be easily designed with the Genially templates.

Concerning implementation, learners are to be divided into pairs or small groups to ensure they do it in pairs and negotiate meaning. Early instructions of tasks and one example should be given by the teachers and then the learners should be allowed to work independently. The teacher intervention during the gameplay must be low and tactical as a way of ensuring that the gameplay is more productive and engaging in terms of active learning and clarifying the misunderstandings instead of providing answers.

In terms of assessment, vocabulary learning must be tested with the help of pre- and post-tests to measure the gains and observational devices to assess the engagement, cooperation, and usage of the actual language use. Perceptions and metacognitive awareness of learners can also be assessed based on reflective, or short learner feedback activities.

The main ideas behind escape-room pedagogy, such as storyline development, puzzles, co-operative learning, and goal orientation, can be applied to offline applications in low resource or low connectivity settings. These can be in the form of printed clue cards, activities station based or paper-based puzzles that are sequentially laid out around the classroom. These modifications allow preserving the pedagogical advantages of escape rooms and minimise dependency on digital infrastructure.

## FUTURE RESEARCH DIRECTIONS

Future investigations must build upon the current evidence by implementing longitudinal designs that identify transfer of vocabulary knowledge over time and communicative situations. Researchers should include delayed post-tests that are several weeks or months post-intervention to assess whether the gains that have been observed are due to a more lasting process of lexical acquisition and not temporary performance effects. These designs would also allow one to examine how repetition, retrieval, and context re-use leads to the solidification and retention of vocabulary with time (Nation, 2022).

Subsequent research must use larger-scale randomised controlled trials of Genially-based escape rooms versus conventional explicit instruction and other digital interventions to strengthen causal inference, as well as, external validity. Further studies on multi-site interventions in dissimilar institutional, geographical, and socio-economic settings such as rural and low-resource would be more enlightening about the scalability, strength, and equity prospects of escape-room pedagogy (Dan et al., 2025).

Lastly, it is necessary to conduct more detailed qualitative and mixed-methods studies to examine the mediating cognitive, affective, and metacognitive processes underlying vocabulary learning in gamified conditions. Interaction between learners, reflective interview, and verbal protocol analyses may provide more insight into the nature of interaction (learner) to negotiate meaning, control attention, and develop autonomy concerning escape-room activities, which would complement outcome-based measures and enhance a more theoretically based reading of digital games-based vocabulary learning.

## CONCLUSION

This action research question explored how an intervention based on a digital escape-room Genially solution can be effective in vocabulary acquisition among primary ESL students. The results are strong indications that the combination of interactive and game-based digital tools can greatly enhance the vocabulary of the learners in a limited time span of instructions.

Quantitative data of the pre-test and post-test showed significant and consistent vocabulary improvements in all the participants. The evidence of the significant rise in the mean scores proves that the intervention was effective in facilitating both vocabulary retention and retrieval. It is important to note that the improvement among learners with lower first level was significant, which is why it can be assumed that the use of digital escape rooms can be especially helpful when it comes to supporting the learners who normally have issues with the conventional teaching of vocabulary. The findings support the previous studies that indicate the potential of game-based learning environments to foster equity in learning (Nation, 2022).

The test was also supported by qualitative limitations of the structured classroom observations that showed that the learners were highly engaged with the lessons, collaborated, and used real vocabulary. Students were found to be attentive during the activities and actively negotiate meaning among themselves and use target vocabulary on their own in meaningful problem-solving situations. Such a combination of both quantitative and qualitative data increases the validity of the results and proves that the Genially digital escape room stimulated cognitive, social, and affective aspects of learning.

Pedagogically, the paper reveals that properly developed online escape rooms can help turn vocabulary learning into active and situational learning. Depth of processing, multimedia learning, and sociocultural interaction concepts were also consistent with the intervention as it involved regular repetition, use of multiple modalities, group activities, and meaningful language use. Consequently, the process of vocabulary learning proved to be meaningful and inspirational among young ESL learners.

To sum up, this paper confirms that Genially-based digital escape rooms are a promising part of the instructional approach to vocabulary building in the primary ESL classroom. Although the sample size and the duration of the intervention are insufficient to extrapolate the study results, the findings provide important information to the classroom practitioners interested in innovative and engaging ways to teach vocabulary. The research can be furthered by future studies through the use of bigger samples, longer treatment time or comparative studies that can focus on the long-term effects of digital escape rooms on vocabulary learning. On the whole, the research is valuable to the current literature on the deliberate use of digital game-based learning items in language teaching.

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