Vocabulary Quest: Investigating Embodied, Gamified Learning Beyond the Classroom

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ABSTRACT

This study addresses the persistent challenge of limited vocabulary retention among language learners, which often results from memorisation practices that lack authentic use. The research investigates the effectiveness of *Vocabulary Quest*, an outdoor gamified activity that integrates movement, teamwork, and simple digital tools to make vocabulary learning active and meaningful. Quantitative and qualitative approaches were combined to capture both performance outcomes and learner perspectives. Fifty- two undergraduates participated in the activity, with twenty-two completing both the pre-test and post-test used for analysis. The results showed measurable improvement in vocabulary scores, while learner reflections revealed that enjoyment, collaboration, and repeated exposure to words enhanced recall and motivation. The findings indicate that embodied and game-based activities strengthen memory through physical engagement and social interaction. The study recommends that language educators incorporate similar movement oriented and collaborative learning designs to promote deeper retention and sustained engagement beyond traditional classroom settings.

Keywords: gamification, embodied learning, vocabulary, situated learning, outdoor learning

INTRODUCTION

The global shift to online learning during the pandemic made it possible for education to continue but also produced unintended consequences for language learning. Many students became passive recipients of information and interaction became limited to screens. After returning to in person learning, teachers recognised the need for classroom practices that restore interaction, movement, and meaningful communication.

Vocabulary learning, of all language areas, was particularly affected because it is often taught through memorisation and repetition without authentic use. Research shows that such isolated learning leads to quick forgetting once the test is over (Schmitt, 2008; Nation, 2013; Webb & Nation, 2017). Learners may recall word forms temporarily but fail to use them effectively in real communication because they lack contextual understanding (Laufer, 2005). Studies in cognitive processing also confirm that shallow memorisation results in weak retention, whereas deeper, meaningful engagement leads to more durable vocabulary knowledge (Hulstijn, 2001).

Vocabulary Quest was developed as an innovative response to the limitations of traditional vocabulary instruction. Instead of focusing on rote recall, it aims to transform vocabulary learning into an active, meaningful, and social experience. The activity invites learners to move, collaborate, and solve problems together while engaging with target words across a sequence of stations. This design draws on the principles of embodied learning and gamification, where physical action and play support cognitive processing and motivation. By using movement and collaboration, Vocabulary Quest provides repeated and contextual encounters with words, allowing learners to construct meaning through experience rather than memorisation. The activity therefore reconnects vocabulary learning with authentic communication and social interaction, elements that were largely missing during the prolonged period of online learning.

LITERATURE REVIEW

Vocabulary Acquisition in Second Language Learning Vocabulary is central to second language proficiency because it supports comprehension, expression, and overall communication (Nation, 2013; Webb & Nation, 2017). Learners typically gain receptive understanding before developing productive use, yet long term retention remains a challenge when words are learned in isolation (Schmitt, 2008). Traditional approaches such as memorisation and translation exercises promote only surface recall and often fail to create meaningful associations. Research consistently shows that repeated exposure and use of words in authentic communicative contexts are crucial for consolidation and retrieval (Webb & Nation, 2017). In other words, vocabulary learning is strengthened when it is embedded in purposeful tasks that require interaction and understanding rather than simple recall.

Gamification in Language Learning Gamification refers to the use of game elements in educational settings to increase motivation and engagement (Deterding et al., 2011). Elements such as points, challenges, feedback, and cooperation make learning more interactive and goal oriented. Studies have shown that gamified learning environments enhance learner motivation and vocabulary acquisition by combining enjoyment with cognitive effort (Reinhardt & Sykes, 2014; Liu, Lin, & Paas, 2020). Gamification also supports self-regulation and persistence, which are essential for vocabulary growth. However, most existing research focuses on digital and classroom-based implementations, leaving limited exploration of embodied, outdoor gamified activities that merge physical and social engagement.

Embodied and Situated Learning Embodied cognition theory asserts that learning occurs through the body's interaction with the environment. Movement, gesture, and sensory experience activate cognitive processes that make learning more memorable (Barsalou, 2008; Glenberg, Witt, & Metcalfe, 2011). Situated learning theory complements this view by emphasising that knowledge is constructed through authentic participation in social contexts (Lave & Wenger, 1991). Together, these perspectives provide a strong foundation for Vocabulary Quest, where learners interact physically with language in meaningful, team-based situations. The combination of embodiment and social context allows words to be linked with experiences, actions, and collaboration, deepening understanding and recall.

Game-Based and Outdoor Learning

Game-based learning uses the structure of play to achieve educational goals through competition, problem solving, and collaboration (Gee, 2005). Outdoor learning extends these principles beyond the classroom, allowing learners to connect language with the environment. Studies show that learning outdoors increases engagement, motivation, and memory retention by providing novelty and authenticity (Rickinson et al., 2004; Tobin, 2021). Recent work also indicates that outdoor vocabulary activities improve contextual understanding and promote active participation (Mariappan, 2025; Richardson, 2025). Despite these advantages, research in higher education remains limited, highlighting the need for further empirical evidence.

Learner Engagement and Motivation

Engagement is a multifaceted concept involving behavioural, emotional, and cognitive dimensions (Deci & Ryan, 2000; Dörnyei, 2001). Gamified and embodied activities sustain engagement by offering immediate feedback, clear goals, and opportunities for collaboration (Landers, 2014). When learners are emotionally invested, they are more likely to engage deeply with vocabulary, leading to improved retention. Studies by Su and Cheng (2015) and Cheng (2025) show that learners often attribute successful word learning to enjoyment and teamwork. These findings suggest that engagement functions both as a psychological condition and as a mechanism for learning.

Research Gap and Objectives

Although many studies have demonstrated the benefits of gamification and digital learning, there remains a lack of research on physically embodied, outdoor vocabulary activities at the tertiary level. Most studies are

confined to classroom or online settings, with limited investigation into how movement and social interaction affect adult learners in non-native English contexts such as Malaysia. In addition, few studies have explored learners' reflections on such experiences, leaving a gap in understanding which features most effectively support memory and engagement. To address these gaps, this study examines Vocabulary Quest as an outdoor, collaborative vocabulary activity that integrates physical movement, problem solving, and teamwork to enhance vocabulary learning.

Objectives:

1. To determine whether participation in *Vocabulary Quest* leads to measurable vocabulary improvement.
2. To explore learners' perceptions of how the experience supports retention and engagement.

METHODOLOGY

This study combined quantitative and qualitative approaches to investigate the effectiveness of Vocabulary Quest in enhancing vocabulary learning. A one group pre-test and post-test design was used to measure vocabulary gains, while open ended surveys provided qualitative insights into learner engagement and perception.

Participants

The participants were fifty-two undergraduates from University Malaysia Terengganu. They represented various academic programmes and had intermediate to advanced proficiency in English. All students participated voluntarily, and informed consent was obtained prior to data collection. Of the total group, twenty-two students completed both the pre-test and post-test, forming the sample for quantitative analysis.

Context

The study was conducted outdoors on the university campus. Vocabulary Quest consisted of five learning stations, each designed to promote embodied learning and collaboration through gamified tasks. The stations were arranged in an open area that allowed teams to move, communicate, and interact freely. Facilitators were stationed at each point to explain instructions, monitor teamwork, and provide immediate feedback.

The five stations were as follows:

1. The Riddle Gate – students solved riddles based on target words.
2. The Action Arena – students acted out words using gestures and movements.
3. The Cipher Circle – teams decoded scrambled letters to form target words.
4. The Secret Sound Clue – learners identified words based on recorded sounds and contextual hints.
5. The Lost Lexicon Board – students completed word puzzles that reinforced word meaning and usage.

Each station involved approximately ten to twelve minutes of interaction, after which teams rotated to the next station.

Instruments

Two instruments were used for data collection. The first was a forty-item vocabulary quiz consisting of matching, recognition, and identification items that tested receptive knowledge of the target words. The same quiz was administered before and after the activity to measure vocabulary gains. The second instrument was an open-ended learner survey that gathered reflections on engagement, task difficulty, and learning experience.

Procedure

The procedure began with a short briefing where participants were introduced to the rules and objectives of the game. They then completed the pre- test individually. Students were divided into small teams and assigned to starting stations. Each team visited all five stations sequentially, guided by facilitators who ensured fair play and time management. Learners collaborated to solve each task and recorded their answers before moving to the next station.

Upon completing all stations, participants took the post-test to measure immediate vocabulary learning. They then responded to the open-ended survey. The entire session lasted approximately two hours.

RESULTS AND DISCUSSION

This section presents both quantitative and qualitative findings from the study. The quantitative results show the measurable effect of Vocabulary Quest on learners' vocabulary performance, while the qualitative data highlight how learners experienced and perceived the activity.

Quantitative Findings

Table 1: Descriptive statistics for pretest and post-test vocabulary scores

Statistic	Pre-Test (%)	Post-Test (%)
Mean	82.6	93.5
Median	90.0	99.0
Minimum	0.0	20.0
Maximum	100.0	100.0
Standard Deviation	23.3	16.9

The results show a clear improvement in vocabulary scores following participation in Vocabulary Quest. The mean score increased from 82.6 to 93.5, and the median rose from 90.0 to 99.0, indicating a general upward trend in learner performance. The minimum score improved from 0.0 to 20.0, suggesting that even lower achieving learners benefited from the activity. The reduction in standard deviation from 23.3 to 16.9 indicates that post test scores were more consistent, meaning that learning outcomes were more evenly distributed across participants.

These quantitative findings suggest that Vocabulary Quest effectively enhanced short term vocabulary knowledge. The improvement supports the argument that repeated and meaningful encounters with target words facilitate retention and recall (Nation, 2013; Webb & Nation, 2017). The structured, multi station format of the activity provided opportunities for spaced repetition and retrieval practice, both of which are known to strengthen memory. In addition, the combination of movement and collaboration likely contributed to deeper cognitive processing, consistent with embodied learning principles (Barsalou, 2008).

Qualitative Findings

Thematic analysis of learner reflections produced four main themes: engagement and enjoyment, vocabulary retention through repetition and context, teamwork and communication, and challenges and suggestions.

Engagement and Enjoyment

Learners consistently described the activity as enjoyable and refreshing compared with classroom lessons. They appreciated the outdoor setting, teamwork, and opportunity to learn through action.

"It was fun and did not feel like a test. I enjoyed solving the riddles with my friends."

"We were not just sitting; we moved around and that made me more active."

These reflections show that the combination of play, movement, and collaboration created a positive learning atmosphere. This aligns with findings from gamification studies which report that game elements such as challenge and teamwork foster intrinsic motivation and engagement (Reinhardt & Sykes, 2014; Liu et al., 2020).

Vocabulary Retention through Repetition and Context Learners reported that repeated exposure to the same words at different stations made the vocabulary easier to remember. They also emphasized that performing actions and solving clues helped them connect meaning with use.

"We kept using the same words, so I remembered them better."

"The acting and guessing made it easier to remember the words later."

These comments reflect the importance of embodied cognition and contextualized practice. When learners physically enact or apply new vocabulary, they create sensory and semantic associations that aid memory (Glenberg et al., 2011).

Teamwork and Communication

Team interaction emerged as an important source of learning. Learners valued sharing ideas, learning from peers, and solving problems together.

"We learned from each other. Some of my friends knew words I did not."

"I liked how we had to talk and share ideas at each station."

This finding supports sociocultural perspectives on language learning, which view knowledge as co constructed through interaction and collaboration (Vygotsky, 1978). Peer support in the game not only facilitated learning but also encouraged communicative use of English in an authentic context.

Challenges and Suggestions

While learners responded positively overall, several mentioned challenges related to task difficulty and time constraints.

"Maybe the words can be more difficult next time."

"Some stations were a bit rushed; we needed more time."

These remarks indicate that differentiation and pacing are essential for maintaining an optimal level of challenge. Similar issues have been noted in other studies of gamified learning, where balance between enjoyment and task complexity is crucial for sustained motivation (Landers, 2014).

DISCUSSION

The overall findings confirm that Vocabulary Quest supported vocabulary learning through multiple complementary mechanisms. The quantitative data show measurable gains, while the qualitative reflections explain why and how these gains occurred. Learners' enjoyment and active participation point to the motivational benefits of gamification. The embodied and contextual nature of the tasks strengthened memory and recall, consistent with the principles of embodied cognition (Barsalou, 2008). The cooperative structure

promoted social learning, echoing situated learning theory which emphasizes participation in meaningful, shared activities (Lave & Wenger, 1991).

The results also reveal areas for improvement. Some participants felt that the vocabulary items were too easy and that the time at each station was limited. These challenges can be addressed through tiered vocabulary levels, clearer facilitation, and flexible timing to accommodate different learner needs. Despite these constraints, the evidence suggests that the integration of physical movement, teamwork, and problem solving creates a rich environment for vocabulary development that extends beyond classroom boundaries.

CONCLUSION

The findings of this study demonstrate that Vocabulary Quest is an effective approach to enhancing vocabulary learning through embodied and gamified activities. The quantitative results show clear improvement in learners' vocabulary performance, while qualitative reflections reveal that the combination of movement, teamwork, and repetition made vocabulary practice more engaging and memorable. Learners enjoyed the novelty of learning outdoors, valued peer interaction, and reported that the repeated encounters with target words across different contexts helped them retain meaning more effectively.

The study supports the argument that vocabulary learning is strengthened when it involves both cognitive and physical engagement. When learners move, act, and communicate in meaningful situations, they process words more deeply and remember them for longer. This reinforces the principles of embodied cognition and situated learning, which view knowledge as something constructed through experience and interaction.

From a pedagogical perspective, Vocabulary Quest offers a flexible and low-cost model that can be adapted to different proficiency levels and learning environments. Teachers can integrate similar game based and movement-oriented activities to increase motivation and collaboration among students. The activity also demonstrates that digital tools do not need to be complex to be effective; simple technologies such as audio recordings and QR codes can enhance interaction and feedback.

Nevertheless, the study has certain limitations. The sample size was small, and the design did not include a control group, which limits generalization. The assessment measured only short-term gains, so future research should investigate delayed posttests to examine long term retention. Further studies could also explore how embodied and outdoor learning affect productive vocabulary use and communication skills.

In summary, Vocabulary Quest successfully reintroduces action, collaboration, and enjoyment into vocabulary learning. It provides evidence that language learning can extend beyond classroom walls and become a lived experience where learners think, move, and communicate in ways that strengthen both memory and motivation.

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