

Fostering English Vocabulary Development of Young Learners through Gamified Learning Activities in Chinese EFL Setting

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Abstract

Building a strong vocabulary is essential in foreign language learning, especially for young EFL learners. This study explored the effectiveness of gamified learning in enhancing vocabulary acquisition and retention among Chinese primary school students. Using a sequential exploratory mixed-methods design, thirty-three students from a local primary school in Wenzhou participated in three weeks of gamified vocabulary instruction. Two pre-tests were used to select unfamiliar target words and establish baseline proficiency. Games connected with vocabulary were introduced each week, followed by an immediate post-test, and a delayed post-test was given after a three-week retention interval. Quantitative test data were statistically analyzed, and qualitative data from classroom observations and student interviews were thematically examined. Results showed that students gained most of the vocabulary and retained it after the interval. Interviews revealed high levels of emotional, cognitive, and social engagement. The study provides evidence for the value of gamification in EFL classrooms and encourages the adoption of more innovative teaching methods that foster greater student engagement in EFL classrooms.

Keywords: Gamified learning, Vocabulary acquisition, Retention, EFL learners, Primary students

1. Introduction

Based on Vygotsky's social constructivist theory, education does not merely mean a cognitive basis for improvement, but also a socio-cultural activity (Vygotsky & Cole, 2018). According to Vygotsky, learning takes place in a social environment in which individuals learn from one another by constantly interacting and observing. The best way to create such a social environment for young learners would be embedding gamified activities into language classrooms. Gamified activities might provide bountiful opportunities for students to connect, collaborate, and interact.

Gamified learning approaches focus on enhancing or changing an existing learning process to generate a revised version of this process that users see as game-like (Landers et al., 2018). Therefore, gamification in the context of learning is a design process of adding game components in order to improve existing learning processes; it is not a product in the same way that a (serious) game is (Deterding et al., 2011; Landers et al., 2018). Using game features and activities in non-gaming contexts to boost learner participation is known as gamification. Avatars, narrative, points, leaderboards, competition, prizes, and role-playing are just a few examples of game aspects. Piaget's and Vygotsky's theories clarify how playing games affects kids' conduct, social, and cognitive development (Ortega, 2003). Gamification is being used more and more to increase the effectiveness and enjoyment of learning (Yildirim, 2017), given its capacity to increase the motivation of primary school pupils to learn, and involvement has been noted (Sun & Hsieh, 2018).

Education is one of the top fields of gamification research (Dichev et al., 2020; Hamari et al., 2014; Seaborn & Fels, 2015). Gamification is defined as "the use of game design elements in non-game contexts" (Deterding et al., 2011, p. 9). It has gained more attention and interest in academia and practice in recent years. Gamification has shown great promise in educational situations because of its purported motivational ability. Research indicates that learning is improved by gaming engagement (Hamari et al., 2014), leading to an increase in learner motivation, flow state, and satisfaction level (Hong et al., 2022). According to another review study, game-based learning offers learners new ways to create their own content, exchange learning experiences, and practice skills for the "real world" (de Freitas & de Freitas, 2013). It may also be useful in helping students develop 21st-century skills (Qian & Clark, 2016). When compared to traditional training, the use of games that blend enjoyable learning with situational and active learning increases engagement and leads to a considerable increase in



topic knowledge gain (Chans & Portuguese, 2021). Not only should game-based learning be used to acquire knowledge, but also to experience success and failure, develop smart use of in-game quick feedback, and prepare for challenging situations in real life. Recent literature reveals that gamification components help students build their interest in and proficiency with self-regulated learning by acting as cognitive and metacognitive scaffolding (Li et al., 2022).

Like in all generations, playing games tends to get players to engage in whatever the goal is, so games have come to represent 21st-century learning. This desire has prompted educators to include games in their lessons. Tobias et al. (2014) conducted a review study that highlights the increasing amount of empirical evidence supporting the efficacy of game-based learning as a teaching tool. It is evident from this empirical data that games actually help individuals learn. When integrating games into educational environments, it is crucial to design activities that include cognitive processes that overlap with those of the games.

One of the most used materials in environments where English is taught as a foreign language is textbooks. However, textbooks that offer two-dimensional content are unfortunately extremely weak in providing interaction opportunities to students, and after a while, students lose interest in this course material. In this context, gamified English learning activities might enable learners to interact with the content. In this way, students will be able to learn by hearing, seeing, and doing thanks to the instructional design that is not based on memorization or literal expression. They will be able to develop behaviors such as thinking, researching, asking questions, and interpreting on their own, receive instant feedback, and experience long-lasting and active learning. In short, gamified learning activities will put the learner at the center and strengthen the learner-content interaction, making the foreign language learning experience fun for students.

Even though there is some research in gamification in educational settings, there is little empirical evidence on the effectiveness of embedding gamified activities into learning English vocabulary in primary school settings in China. Public schools in China start teaching English in the third grade, and English is a compulsory subject in vocational high schools, general high schools, and all universities. According to Rao (2019), English has spread throughout the world and is a crucial tool for people seeking advancement and a high-quality life. China is no exception and regards proficiency in a foreign language as one of the fundamental skills for students in primary and middle school (Cheng, 2014). In the context of China, learning English is typically restricted to traditional classroom settings where social hierarchy dominates teacher-centered, textbook-centered, and grammar-centered language classrooms (Liao, 2003). This study will fill the gap by bringing an innovative approach to the foreign language teaching and learning process through gamified activities to boost motivation, engagement, and learning.

With the goal of teaching English to primary school students as a foreign language (EFL), this study attempts to address the crucial need for innovative approaches to vocabulary acquisition. Investigating how well gamified learning activities might improve vocabulary acquisition is the major goal of this study. The main objectives of the study are as follows:

- a. To evaluate the effectiveness of gamified learning in enhancing vocabulary acquisition among K-12 EFL learners.
- b. To assess students' engagement and motivation levels when using gamified learning tools.
- c. To measure the vocabulary retention rates of the participants who receive instruction with gamified learning activities.

2. Methods

A mixed-methods sequential exploratory design was employed in the study to fulfill the objectives of the research. The term "mixed-methods research" describes how a researcher gathers data for a study by fusing quantitative and qualitative concepts, techniques, and methodologies (Creswell, 2021). Studies using a combination of methods can provide more insight into the phenomenon being studied. The first step in the sequential explanatory design is the collection and analysis of quantitative data. After that, qualitative data are gathered to supplement, deepen, and validate the quantitative findings (Creswell, 2021). Because it features a "triangulation" aspect, mixed-methods research is effective. This method allows researchers to simultaneously search for answers to "what" and "why" questions (Flick, 2018).

In this context, the comparison of the participants' pre-, immediate, and delayed post-test achievement scores constituted the quantitative aspect of the study. By utilizing a content analysis of the interviews with the participants at the end of the procedure, the qualitative dimension of the research was completed. This study was supported by Wenzhou-Kean University Student Partnering Faculty Social

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2.1. Participants

33 4th-grade students from a public primary school in Wenzhou, China, participated in this study. Participation was on a voluntary basis. Written and signed consent forms were received from parents of the participants and from the school principal.

2.2. Instruments

For the purpose of the research, 30 target words that consist of nouns, verbs, and adjectives were selected via two diagnostic tests to ensure that none of the words were known or recognized by any of the participants. The two diagnostic tests included two questions each. The first question was a yes/no type of question, and it asked if the participant knew the meaning of the target word. The second question asked if the response to the first question was positive, write the definition of the word in Chinese. Three immediate post-tests, each including 10 target vocabulary items, were prepared in multiple-choice, true/false, and matching question formats. The delayed post-test included 30 questions, including multiple-choice, true/false, and matching question formats. At the end of the gamified teaching process, the researchers conducted focus-group interviews with nine voluntary participants to gauge student engagement and motivation. The focus-group interview was centered around the question "How do you feel about the vocabulary games in your English class?"

2.3. Procedure

As the first step, a preliminary literature review on gamified learning and game designs was conducted prior to the implementation. Official documents such as consent forms, interview protocols, and invitations were prepared and shared with the parents, the school principal, and the classroom teacher.

Executing the interventions and collecting qualitative and quantitative data took two months. For the first week, meetings were held with the school administration and the English teachers to give brief information about the research and to collaboratively decide on the date/hour/and venue of the research interventions. Following two weeks, the students were given two vocabulary diagnostic tests (Pre-tests) to determine the target vocabulary and to make sure none of the students were already familiar with the words. During the following three weeks, target words were taught in gamified activities, and immediate post-test data were collected after each intervention to measure the students' vocabulary gains. Following the interventions, focused group interviews were conducted. After a two-week interval, the participants were given the delayed post-test. Figure 1 below shows the research procedure in detail.

Figure 1. The research procedure



2.4. Games

Vocabulary Bingo

Students receive a Bingo card with pictures instead of numbers. Each picture represents a target vocabulary they have recently learned. The teacher calls out the words randomly, and students must mark the corresponding picture if they have it on their card. The first student to get five in a row (horizontally, vertically, or diagonally) shouts "Bingo!" and wins a small prize.

The competitive aspect of Bingo engages students and adds excitement to the learning process. Krashen's (1992) Input Hypothesis states that learners acquire language when they are exposed to comprehensible input that is just a little bit above their current skill level. The pictures on Bingo cards provide context, making the input more comprehensible and aiding vocabulary retention. This game also enhances the learning process through interaction. The importance of social interaction in learning is emphasized by Vygotsky's Social Development Theory (Vygotsky & Cole, 2018). As learners check their responses with one another, they engage in peer interaction and communication during this Bingo activity.

Vocabulary Relay Race

Students are divided into teams. Each team stands in a line, and a basket with vocabulary word cards is placed at the front. On the teacher's signal, the first student in each line picks a card, runs to a board, and draws a picture representing the word. The next student then guesses the word, picks a new card, and repeats the process. The team that finishes first with the most correct words wins.

The relay race is lively and enjoyable due to its physical component and competitive element, which appeals to the innate playfulness and energy of young learners. According to Swain's Output Hypothesis, speaking and writing assist students in identifying their knowledge gaps and reinforcing what they have learned (Swain, 2005). Deeper processing is facilitated by the active use of vocabulary required for drawing and word guessing. In terms of learning theories, this vocabulary relay race incorporates kinesthetic learning, which is in line with Gardner's (1987) Theory of Multiple Intelligences. The theory acknowledges that kids have varying talents and learning styles. This exercise might appeal to learners who are bodily-kinesthetic and gain from movement-based activities.

Vocabulary Scavenger Hunt

The teacher hides various objects or picture cards around the classroom that correspond to vocabulary words. Students are given a list of words and must find the items that match the words on their list. Once they find an item, they bring it to the teacher, say the word aloud, and use it in a sentence. The first student or team to find all items correctly wins.

Vocabulary acquisition becomes a thrilling quest thanks to the scavenger hunt activity's exploratory and adventurous aspect, which boosts student motivation and engagement. The goal of task-based language teaching is to facilitate language learning through the use of meaningful tasks. It is easier for students to practice and internalize new words when they locate and use vocabulary items in context. Similarly, Piaget's Constructivist Theory, which holds that knowledge is constructed by learners via active investigation and discovery (Ortega, 2003), is incorporated into this activity. The scavenger hunt's interactive, hands-on format enhances experiential learning by enabling students to directly interact with objects and language to expand their vocabulary.

These gamified vocabulary exercises combine play, competitiveness, and active participation, all of which are supported by well-established theories in language acquisition and education. These gamified exercises were implemented to improve motivation, engagement, and retention of new vocabulary.

2.5. Data Analysis

Quantitative data from the immediate post- and delayed post-tests were analyzed using statistical methods (paired samples t-test) to determine the effectiveness of gamified learning on vocabulary acquisition and retention. All test results were statistically analyzed by using the Statistical Package for Social Sciences (SPSS). Descriptive statistics were used to determine the immediate post-test success level. Qualitative data from observations and focused-group interviews were analyzed thematically by utilizing the Constant Comparison Method. All researchers analyzed the transcripts independently by highlighting the important statements that indicate certain codes. The analysis

adopted an inductive method as all codes emerged from the raw data, not including pre-determined codes and themes. Until all researchers reached a consensus, the codes were not determined. Based on the codes, more general themes were identified.

3. Findings

3.1. Quantitative Data Analysis

Immediate post-tests revealed that the participants had gained most of the vocabulary. Descriptive statistics showed that the average mean scores for first, second, and third immediate post-tests were 76.97 on average. Delayed post-test results revealed that, despite the two-week interval since the last immediate post-test, the participants still retained most of the words. Findings revealed a slight decrease in the mean scores from immediate to delayed post-test, with mean scores of 76 and 66, respectively. Table 1 below shows the descriptive statistics of the immediate post-tests and delayed post-tests.

Table 1. Mean scores of immediate post-tests and delayed post-tests

Test Type	Mean	Std. Deviation	Std. Error Mean
Immediate Post Test	76.97	24.810	4.319
Delayed Post Test	66.06	25.269	4.399

n=33

A paired samples t-test was conducted to compare students' vocabulary scores immediately after instruction and five weeks later. Results indicated a slight but marginally significant decline from the immediate post-test ($M = 76.97$, $SD = 24.81$) to the delayed post-test scores ($M = 66.06$, $SD = 25.27$), $t(32) = 1.95$, $p < .05$ (one tailed), $d = .34$. This suggests students retained most vocabulary over five weeks, with only a slight decline. Table 2 below presents the paired samples t-test statistics.

Table 2. Paired samples t-test statistics for the immediate and delayed post-test

	Mean	Std. Deviation	Std. Error Mean	Paired t test		
				t	df	Sig (1-tailed)
Immediate Post Test - Delayed Post Test	10.909	32.105	5.589	1.952	32	.030

n=33

3.2. Qualitative Data Analysis

To explore students' perceptions of gamified vocabulary learning, qualitative data were also collected through classroom observations and interviews. Thematic analysis revealed three major types of engagement: affective engagement, cognitive engagement, and social engagement. A total of nine engagement subthemes were identified across student responses.

Table 3 below shows important statements, codes, counts, and themes that emerged from the analysis of primary students' responses. On the left column, the extracts from the participants' original statements are shown. In the middle are codes that emerged from the important statements with counts. On the right column are the themes that emerged based on the codes after numerous discussions and negotiations among the researchers.

Table 4. Thematic Categories of Student Engagement

Examples	Codes	Counts	Themes
"Mainly because the words are difficult and challenging, I want to have a try."	Motivation	5	Affective engagement
"Everyone talked with the teacher after class."	Interest	12	
"It has that interactive game in it."	Attraction	5	
"It's just a lot more fun than normal English classes."	Enjoyment	10	
"There was some physical interaction, which helped us remember the words better."	Recalling	8	Cognitive engagement
"They use physical objects."	Visualizing	8	
"When we thought of the action, we knew what it means."	Recognizing	2	
"It is easier to remember English words and things in this way."	Remembering	14	
"But I still needed to ask my classmates."	Cooperation	2	Social engagement
"Then we acted it out so that others could guess what it means and said the word out loud."	Group work / Teamwork	2	
"We always lost in the competitive games!"	Competition	2	

Students showed strong affective engagement, with the most frequently coded category being interest (n=12), followed by enjoyment (n=10), motivation (n=5), and attraction (n=5). Games were perceived as more enjoyable and stimulating than traditional classes. Additionally, cognitive engagement emerged through strategies such as remembering (n=14), recalling (n=8), visualizing (n=8), and recognizing (n=2). Physical actions and interactive games supported understanding and retention. Though less frequent, social engagement was also evident. Students mentioned cooperation, group work/teamwork, and competition (each n=2) as part of their learning experience. Some described working experience with peers to guess meanings, and enjoyed the group dynamics.

4. Discussions and Conclusions

This study investigated the effectiveness of gamified learning activities in enhancing vocabulary acquisition and retention among Chinese primary school students in an EFL setting. Quantitative results demonstrated that students experienced significant vocabulary gains immediately after gamified instruction, and although a slight decline occurred after five weeks, retention remained relatively strong, as evidenced by a modest effect size. It was natural for students to forget some of the words, and the results indicated that students already did quite well in learning these words, which aligns with previous literature highlighting the benefits of gamified learning in fostering lasting vocabulary retention (Hamari et al., 2014; Hong et al., 2022; Sun & Hsieh, 2018; Yildirim, 2017). Qualitative analysis enhanced these findings, revealing significant affective, cognitive, and social engagement among students. Affective engagement, particularly interest and enjoyment, emerged prominently, confirming the motivational benefits of gamification. Themes of cognitive engagement

emphasized how physical interactions and visualization strategies during games improved vocabulary retention, supporting theories of embodied and experiential learning. Although social engagement was less frequent, it highlighted the advantages of collaboration and competition, reinforcing Vygotsky's focus on social learning contexts.

To sum up, this study demonstrates that gamified vocabulary activities can effectively foster student motivation, enhance vocabulary retention, and create a more interactive learning environment. For practitioners in Chinese EFL contexts, especially in traditional, teacher-centered, exam-based classrooms, this approach offers a practical alternative that places EFL learners at the center of the learning process.

However, the study is not without limitations. The sample size was relatively small and drawn from a single primary school, which limits generalizability. Additionally, the study did not include a control group, which makes it difficult to attribute gains solely to the gamified intervention. Future research can adopt a more rigorous experimental design by incorporating a control group and comparing gamified instruction with traditional methods. Longitudinal studies with larger and more diverse samples could provide deeper insights into the sustained impact of gamified learning on vocabulary development, learner autonomy, and long-term language outcomes.

Despite these limitations, this research provides valuable insights for multiple stakeholders. For educators, it offers a practical framework to enhance Chinese EFL classroom engagement and learning effectiveness. For policymakers and curriculum designers, it highlights the potential of gamified instruction to modernize English language education in Chinese primary schools. For researchers, it lays a foundation for further exploration into innovative, student-centered gamified approaches to language learning in diverse educational settings.

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