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The Impact of Digital Game-Based Learning to Enhance English Spelling for Primary Students

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Abstract

This study aims to investigate the development of English spelling ability through game-based learning (GBL). A quasi-experimental one-group pre test-post test design was employed among 24 Grade 3 students in a school in Thailand who were chosen using purposive sampling in the second semester of the 2024 academic year. The research instruments included three lesson plans, and English spelling ability tests. Means, standard deviations, and a t-tests were used to analyze data. The findings indicated a statistically significant difference between the performance of the students in spelling before and after engaging in GBL activities. They affirmed the strength of GBL in promoting spelling skills by boosting learner motivation, active involvement, and suppression of learning anxiety. These findings also demonstrate how GBL can develop a cooperative, reciprocal learning experience. Future research should incorporate a control group for comparison, involve a larger and more diverse sample across different schools or regions, and employ longitudinal studies to measure the long-term effects of GBL on English spelling abilities.

Keywords: English Spelling Ability, Game-Based Learning, Primary Students, Digital Learning, Quasi-Experimental Design, English as Foreign Language (EFL)

Introduction

Language is an important tool for communication among people in different parts of the world. English is one of the most widely used languages and often known as an international language. It is used as an official language in many countries and plays an important role in various fields such as business, tourism, travel, entertainment, and especially education ([Shrishthy, 2023](#)). As the world continues to develop, the need for English language skills has become increasingly important. In today's world, technology also helps make learning English easier and more accessible ([Adipat, 2021](#); [Maghfiroh, 2021](#)). According to [Mahu \(2012\)](#), learning English can improve personal development. It builds important life skills such as adaptability, problem-solving, and critical thinking.

In Thailand, the Ministry of Education has included English as a core subject in the [Basic Education Core Curriculum B.E. 2551 \(2008\)](#). Students start learning English from Grade 1 to Grade 12. The goal is to help students communicate in English, search for knowledge, and develop themselves. These skills are important not only for individuals, but also for the development and competitiveness of the country.

One of the key learning competencies in the curriculum is communication, which includes the use of English to learn and connect with the world.

According to national assessment results (O-NET, 2022), the average English score for Grade 6 students in Thailand was 36.54 out of 100, indicating low proficiency. One contributing factor is poor spelling ability, which is commonly caused by the irregular relationship between English pronunciation and spelling. Pongsukvajchakul (2022) pointed out that common causes of spelling mistakes include pronunciation, consonant sounds, word structure, and spelling rules. In many schools, students are still asked to memorize vocabulary without understanding. This makes it difficult for them to correctly remember or spell words. For example, in a Grade 3 English class in the second semester of the 2024 academic year, it was found that although students could pronounce the words correctly, many still spelled them incorrectly. In addition, the classroom activities were neither interesting nor engaging. Vocabulary knowledge can be developed in various ways, and game-based learning (GBL) is one of the effective approaches taken into consideration.

GBL is a teaching approach that uses active technology to improve student learning. It helps promote critical thinking and problem-solving skills by allowing students to play games that are designed based on curriculum content. These games help enhance students' knowledge and learning abilities (Rajan, 2022). This type of learning can be applied in many ways to increase teaching effectiveness and to support classroom learning. When game-based learning is designed according to learning principles, it can boost student motivation, engagement, and participation in lessons (Pho & Dinscore, 2015). Moreover, this method encourages students to achieve their learning goals through game-playing processes that include clear rules and shared agreements. As a result, students enjoy learning and become more involved in the classroom activities (Jompaeng, 2022).

Several studies in Thailand have shown that game-based learning helps students improve their English vocabulary and spelling skills. Kathinthong & Adipat (2022) found that Grade 7 students

learned more vocabulary after learning through games. The students also showed more interest, confidence, and willingness to participate in the classroom activities. Wangdee et al. (2023) created lesson plans for Grade 7 students using games. The students had considerably higher scores when they were taught using GBL and claimed that they were highly satisfied with the lessons. Similarly, Kunkaew (2024) reported that Grade 5 students improved their vocabulary after using vocabulary games in class. These findings suggest that using games in teaching not only supports learning outcomes but also increases student motivation.

However, past studies have mainly explored vocabulary learning and applied it to upper primary or lower secondary school students. There is a notable lack of research focusing specifically on spelling skills in younger learners, particularly in Grade 3. Additionally, although vocabulary and spelling are interconnected, they require different cognitive and teaching methods. Limited empirical evidence exists regarding how GBL can be used to facilitate spelling instruction, specifically in Grade 3 classrooms in Thailand. This discrepancy is essential, because spelling is a primary literacy activity that affects students writing fluency and reading comprehension.

To address this research gap, this study aimed to answer the following research question: "To what extent could game-based learning improve the English spelling ability of Grade 3 students in Thailand?" It sought to contribute to the growing body of research on GBL by focusing on spelling as a specific learning outcome and by providing evidence from early primary education contexts.

Game-Based Learning

Game-Based Learning (GBL) is an effective learning method, which involves using active technology to positively affect student engagement and success rates. It can especially help in fostering thinking, analysis, and problem-solving since it focuses on hands-on activities within the context of learning (Rajan, 2022). Pho & Dinscore (2015) noted that, when especially created based on sound pedagogy, the games have the potential to enhance student motivation, engagement and achievement in the classroom.

The researcher highlights several educational advantages of games. These are the improvement of critical thinking, the motivation of efficient problem solving in a group and a competitive manner, support of learning styles, and social learning in the company of peers. Similarly, [Adipat \(2021\)](#) mentioned that digital games are highly engaging in terms of attraction to students because games have interesting sound effects and visual designs. Digital games also enhance language development by stimulating communication and cooperation.

Several studies conducted in many countries, including Malaysia, Indonesia, China, the Philippines, Germany, Iran, and Thailand, have demonstrated the effectiveness of game-based learning across multiple dimensions. For instance, [Tan et al. \(2022\)](#) conducted an experimental study to explore how effective GBL through The Sims 4 can be used to improve the English vocabulary learning process and metacognitive awareness in 65 Malaysian undergraduate students. The findings revealed that the students gained their significant English vocabulary and developed metacognitive knowledge.

In a similar effort to improve vocabulary acquisition, [Sayd & Nazarudin \(2022\)](#) in Indonesia conducted a two-cycle experimental study, with four stages: planning, implementing, observing, and reflecting, to enhance the acquisition of vocabulary by increasing the motivation and interest of students in playing games. They found that there was a significant change in the performance on a vocabulary test (increased by 32 percent) that led to better results (56 percent in the first round and 88 percent in the second round), showing the motivational and teaching capabilities of GBL. Supporting similar conclusions, in China, [Zhou \(2024\)](#) studied digital games in the development of English vocabulary among adolescent EFL learners. Their research showed overall positive results, such as enhanced vocabulary acquisition, motivation, and anxiety reduction, which proves the importance of GBL in various educational settings.

In terms of spelling ability, another study exploring the impact of GBL on the English spelling ability through Kahoot was conducted by [Patiluna et al. \(2025\)](#) in the Philippines. The intervention

carried out among Grade 10 students revealed that none of the students passed the spelling pretest, although after completing the GBL activities, over 50 percent of students received 31-50 points out of 50 in the posttest. Besides significant enhancements in the findings, the students also noted their increases in motivation, ability to concentrate and positive attitudes towards learning. These findings indicate the possibility of digital game-based platforms such as Kahoot to improve spelling abilities as well as affective and engagement levels of learners in English classrooms.

Similarly, in Germany, the use of digital spelling games called Meister Cody - Namagi app ([Ihrig, 2024](#)), showed considerable improvements in spelling and literacy-related abilities among primary learners. Furthermore, an adaptive digital platform also proved that individual error rates can be decreased, and personal spelling learning can be facilitated through personalized instruction. The findings therefore stress the efficiency of GBL as a tool to enhance the spelling skills, along with the positive effects of enhanced motivation, learner activity, and decreased anxiety which are a crucial part of effective, successful English language acquisition.

This emphasis on the affective domain in the process of learning a foreign language is further confirmed in [Ahmed et al. \(2022\)](#) study conducted in Iran. The findings from their investigation on the implications of GBL with regard to the language anxiety and motivation of 58 EFL learners revealed that the experimental group of students reported a decreased level of anxiety and improved language motivation, which showed the potential of GBL in the creation of a more supportive and emotionally positive learning environment.

Several studies in Thailand have shown that game-based learning helps students improve their English vocabulary and spelling. [Wangdee et al. \(2023\)](#) created lesson plans for Grade 7 students using games. The students had considerably higher scores when they were taught using GBL and claimed that they were highly satisfied with the lessons. Similarly, [Kathinthong & Adipat \(2022\)](#) proved that Grade 7 students who were exposed to learning utilizing GBL had exceptionally higher scores on

the vocabulary test after the completion of the study and were highly satisfied with the involvement and interest presented in the lessons. The students also showed more interest, confidence, and willingness to join classroom activities.

Similar research was conducted by [Intharasomjai \(2021\)](#) who examined how vocabulary games could help Grade 9 students improve their spelling and word recognition. Statistically significant gains beyond a 70% benchmark were achieved and students had indicated high enjoyment, confidence, and motivation. Similarly, [Kunkaao \(2024\)](#) reported that Grade 5 students improved their vocabulary after using vocabulary games in class. These findings suggest that using games in teaching not only supports learning outcomes but also increases student motivation. [Jomsri et al. \(2020\)](#), who created a vocabulary game using Scratch and found that students improved their vocabulary and were highly satisfied. Similarly, [Punjasutaros & Prasansaph \(2023\)](#) found that Grade 6 students who learned through digital games improved their vocabulary skills and enjoyed the learning experience.

[Phonlaksaa \(2018\)](#) investigated the effectiveness of GBL form among Grade 4 students and reported an increase in vocabulary knowledge by 84.27 percent after the instruction on GBL. In addition, greater retention of vocabulary with time was also reported in the study, which supports the long-term effectiveness of a game-based approach to teaching. Moreover, [Nilsson & Hussain \(2024\)](#) examined the impact of digital games on adolescents' vocabulary gains. The results of their study support the role of digital game-based teaching in increasing the vocabulary, decreasing anxiety about learning and enhancing learners' motivation.

Research Question

To what extent could game-based learning improve the English spelling ability of Grade 3 students?

Methodology

This study employed a quasi-experimental research design, using the one-group pre test-post test design to investigate the effectiveness of game-based learning.

Participants

Population

The population of this study consisted of 48 Grade 3 students at a school who were enrolled in the second semester of the 2024 academic year. The students had mixed levels of English proficiency, including high, average, and low achievers.

Sample Group

The sample group consisted of 24 Grade 3/1 students from a school in Thailand, who were studying in the second semester of the 2024 academic year. Purposive sampling was used to select the sample.

Research Instrument

Lesson Plans

Three game-based unit plans were developed and designed to improve the English spelling skills, each lasting three hours. These plans were developed and validated in such a way that a systematic process was followed to guarantee quality and effectiveness. The three experts evaluated the lesson plans and judged their suitability of these lesson plans based on the three important elements including general lesson plan construction, material content and learning activities. The Likert scale ([Srisaard, 2010](#)), consisting of five levels (most appropriate, appropriate, moderate, inappropriate, and least appropriate) was used to conduct the evaluation. The scores provided by the experts were examined to determine the average rating. The overall mean score was 4.94, indicating that the lesson plans were well suited and of superior quality.

Test

An English spelling test was developed to assess students' knowledge of English spelling before and after the intervention. The test consisted of 30 items and was administered to the students for 60 minutes to complete. The test aimed at assess the students' spelling ability before and after they participated in the GBL instruction.

Three experts were invited to analyze the test to measure its content validity by assessing the relevance between each test item and the learning objective. The score of Index of Item-Objective

Congruence (IOC) was computed and the result was 1.00 representing the high degree of content validity. A pilot study was then conducted with a group of 24 grade 3 students who were not included in the sampling group. The results were analyzed in order to obtain a difficulty index (p) and a discrimination index (r), with the values between 0.54 and 0.67 and 0.29 and 0.50 respectively, which fell within the acceptable range.

Data Collection and Analysis

Data were collected from the sample group of 24 students from Grade 3 enrolled in English Primary 3 during the second semester of the 2024 academic year. The researcher explained the purpose of the study to the students to help them understand and cooperate during the learning activities. An English spelling pretest with 30 questions was administered to students with a time limit of one hour. The researcher then taught the students using game-based learning activities over a period of four weeks, with a total of 12 hours of instruction. Upon completion of the study, the same English spelling test was administered to measure the students' progress after learning through GBL.

In this study, the data were analyzed based on the research objective. First, the researcher calculated the mean, standard deviation, and percentage to assess the students' English spelling ability. The results were examined both overall and in specific aspects, comparing the results from the pre- and post-tests after the implementation of GBL. A dependent-sample t-test was conducted to test the research hypothesis. This statistical method was used to compare the students' English spelling scores before and after the game-based learning activities in order to determine whether there was a significant improvement in their spelling ability. This analysis helped the researcher determine the effectiveness of using GBL in improving the students' spelling skills.

Results

The results are presented in two primary aspects as follows: 1) the students' English spelling scores; and 2) the comparison of English spelling knowledge before and after learning through game-based learning.

Table 1 Comparison of English Spelling Knowledge Before and After Learning through Game-based Learning (n=24)

Test	Scores	N	Mean	S.D.	D	t	df	Sig
Pretest	30	24	5.13	3.86	14.08	18.39*	23	.000
Posttest	30	24	19.21	6.45				

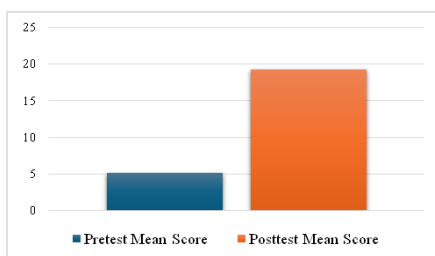


Figure 1 Comparison of Mean Scores English Spelling Knowledge Before and After Learning through Game-based Learning (n=24)

Table 1 and Figure 1 reveal higher mean scores of the students' performance on the English spelling test after learning through game-based learning (M = 19.21, S.D. =6.45), compared to the pre-test

mean score (M = 5.13, S.D. 3.86). The mean difference (\bar{D}) between the pre- and post-test scores was 14.08. The t-test value was 18.39, which was statistically significant at the 0.05 level ($p < .05$). Based on these findings, game-based learning made a significant positive contribution to students' English spelling abilities. The observed increase in post-test scores indicates that students were better able to recognize, remember, and apply spelling knowledge after participating in interactive game-based instruction. The positive improvement proves the efficacy of incorporating GBL in the process of making spelling instructions more stimulating, hence, increasing student motivation and retention, and supporting its integration in teaching spelling at the primary level.

Discussion and Conclusions

The students who participated in GBL instruction had a substantially improved post-test scores for English spelling proficiency in comparison to pre-test scores, with statistical significance at .05. This finding proves that game-based learning is effective in improving students' English spelling proficiency. The enhancement resulted from the entertaining nature of games utilized, combined with a platform through which students could actively learn and practice under pressure-free and easy conditions. This is in line with what the researcher noted, where learners improved their academic performance after employing digital games.

Similarly, the study conducted by the researcher showed that digital game-based learning can assist students in memorizing vocabulary. also aligns with the idea proposed by researcher, who emphasized that 21st-century English instruction should incorporate technology to create learning. Students gained improved spelling skills, knowledge of how words can be built and of letter sequences after playing games. Some games were also provided so that the sound-letter association could be strengthened and the spelling practiced using simulated tests, Wordwall and Baamboozle games. This shows that games can be an effective method of teaching spelling since learners are able to practice spelling recursively in an activity that seems pleasurable to them, and they therefore get to remember better and become motivated due to games as compared to the traditional methods of teaching.

[Pongsukvajchakul \(2022\)](#) asserted similar findings when stating that the main issues of spelling among Thai students are the lack of knowledge of the structure of words and that games can make the learners more aware of the patterns. Motivation is one of the main factors which promotes skills development, and games have a great importance in this aspect. The colorful graphics, sound effects and other interactive features incorporated in the games employed in this study played a part in bringing joyous atmosphere to the learning environment, and students felt free to take an active role in the

lessons. [Adipat et al. \(2021\)](#) and [Ahmed et al. \(2022\)](#) stated that games have the ability to not only lessen anxiety but also make learners more motivated to use languages, which confirms the results of the present study.

Although the results of the study confirm the effectiveness of game-based learning to promote students' English spelling ability, some limitations have to be acknowledged. First, the research involved the use of one-group pre test-post test design without control group, which limits the ability to attribute the improvements solely to the intervention. Second, this study did not assess the long-term retention of spelling knowledge; therefore, questions may arise regarding the lasting effects of learning outcomes. In future, the studies may focus on such recommendations as the use of a control group, enlargement of samples across different schools or regions, and incorporation of longitudinal studies to measure long-term effects.

Recommendations for Future Research

From the findings and conclusions of this study, the researcher provides recommendations for further studies.

1. This study focused only on grade 3 students. Further research should be conducted with students at different educational levels
2. This study focused on English spelling. Further research should be extended to focus on the development of other English language skills, such as pronunciation and translation.
3. Further research should investigate the effectiveness of other online educational games beyond those utilized in this study.
4. Future research should employ a two-group experimental design, consisting of a control group and an experimental group, to allow for more accurate comparisons.
5. This study employs a quantitative research approach. Further studies should use qualitative methods of study to compare the quality and effectiveness of different educational games in to enhance students' learning outcomes.

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