EFFECTS OF GAME-BASED LEARNING ON 3RD GRADERS' VOCABULARY ACHIEVEMENT
ผลการเรียนรู้แบบเกมส์เป็นฐานเพื่อส่งเสริมความสามารถด้านคำศัพท์
ของนักเรียนชั้นประถมศึกษาปีที่ 3

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ABSTRACT
Students' abilities to communicate, read and write effectively are vital for success; it depends on how well students acquire and retain new vocabulary developed through vocabulary enrichment lessons and activities. In Thailand, English as foreign language learners (EFLs) struggle with vocabulary deficit challenges. Since games have been an inevitable part of education, they have indescribably transformed educational outcomes with a higher emphasis on learner-centric pedagogy. Thus, computer games are considered effective alternative instruments that promote students' engagement and fun learning processes. This tended to show an improvement in the attainment of learning objectives compared to students using standard instructional methods. Hence, using the game-based learning (GBL) method, this study employs a quantitative research approach and elements such as pretest and posttest, survey questionnaires, and four lesson plans, which were approved by the experts, including assessments of English vocabulary items related to four themes extracted from the English curriculum and student's English textbooks, and designed according to the unit lesson plan within eight weeks and a total of twelve hours for students to examine the effect of GBL on vocabulary achievements. There were 90 participants in this quantitative research. The learning satisfaction survey after being taught by using games. The data were analyzed for the mean, standard deviation, and t-test dependent. Using GBL from across the four vocabulary themes revealed that GBL is effective in improving 3rd graders' English vocabulary achievement. It also provided a fascinating account of several games that are popularly used to facilitate effective learning in various settings.
Keywords : Game-based learning, English vocabulary achievement, Traditional approach, Learners' motivation

บทคัดย่อ
ความสามารถของผู้เรียนในการสื่อสารที่มีประสิทธิภาพเป็นสิ่งสำคัญที่จะนำไปสู่ประสบความสำเร็จ ซึ่งขึ้นอยู่กับการเรียนรู้คำศัพท์ใหม่ของผู้เรียนโดยผ่านบทเรียนและกิจกรรมเสริมคำศัพท์ในประเทศไทยผู้เรียน ต้องต่อเผชิญกับปัญหาการขาดการเรียนรู้หรือกิจกรรมการเรียนรู้เพื่อเสริมคำศัพท์ และเมื่อเกมสามารถเป็นส่วนหนึ่ง ของกิจกรรมการเรียนรู้ที่เลี่ยงไม่ได้ เกมจึงได้เปลี่ยนแปลงผลลัพธ์ด้านการจดจำคำศัพท์โดยเสริมการเรียนรู้ของผู้เรียน เน้นผู้เรียนเป็นศูนย์กลางมากขึ้น ดังนั้นเกมคอมพิวเตอร์ที่เสริมการเรียนรู้ จึงถือเป็นเครื่องมือที่มีประสิทธิภาพที่ส่งเสริม

การมีส่วนร่วมและกระบวนการเรียนรู้ที่สนุกสนานของผู้เรียน ผู้เรียนที่ใช้เกมเพื่อการเรียนรู้มีแนวโน้มผลลัพธ์การเรียนรู้ที่ดีขึ้นในการบรรลุวัตถุประสงค์การเรียนรู้ด้านคำศัพท์ ดังนั้น วิธีการเรียนรู้จากเกมจึงถูกใช้ในงานวิจัยนี้ การศึกษานี้เป็นการวิจัยเชิงปริมาณ กำหนดกลุ่มตัวอย่าง 90 คน และเครื่องมือในงานวิจัยประกอบไปด้วยการทดสอบก่อนและหลังการเรียนรู้ แบบสอบถาม และแผนการสอน ซึ่งผ่านความเห็นชอบจากอาจารย์ที่ปรึกษาแล้ว รวมถึงการประเมินรายการคำศัพท์ภาษาอังกฤษ จำนวน 4 หัวข้อ ที่มาจากหลักสูตรและหนังสือเรียนภาษาอังกฤษของผู้เรียน การออกแบบแผนการสอนของหน่วยการเรียนรู้จำนวน 8 สัปดาห์ รวมทั้งหมด 12 ชั่วโมง เพื่อให้ผู้เรียนตรวจสอบผลการเรียนรู้และผลสัมฤทธิ์ของการเรียนคำศัพท์ ผลของการใช้เกมในการเรียนรู้คำศัพท์ แบบประเมินความพึงพอใจสถิติที่ใช้ในการวิเคราะห์ข้อมูลคือ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และการทดสอบค่าเฉลี่ยความแตกต่างของผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียน (t-test แบบ dependent samples) ผลงานวิจัยเผยว่าเกมมีประสิทธิภาพในการเพิ่มผลสัมฤทธิ์ทางการเรียนคำศัพท์ภาษาอังกฤษของนักเรียนชั้นประถมศึกษาปีที่ 3 นอกจากนี้ยังให้ข้อมูลที่น่าสนใจเกี่ยวกับเกมต่าง ๆ ว่าเกมได้รับความนิยมเพื่อส่งเสริมการเรียนรู้คำศัพท์ที่หลากหลายได้อย่างมีประสิทธิภาพ

คำสำคัญ : การเรียนรู้ผ่านเกม, การเรียนรู้ผ่านสื่อเกมเรียนรู้, ความสำเร็จของคำศัพท์ภาษาอังกฤษ, แรงจูงใจของผู้เรียน

INTRODUCTION

There is a lot of evidence that Thai students' struggles with learning English are due to their limited vocabulary knowledge, unskilled and inexperienced teachers, and unmotivated pupils (Kathinthong & Adipat, 2022, p. 235). Thai students who study in English-language programs do worse in mathematics due to their low reading and comprehension skills in English. To communicate, understand a word's meaning, or correctly spell a term in a foreign language, Thai students often struggle with their vocabulary (Noom-ura, 2013, pp. 139-140). This is due to the significant relationship between vocabulary knowledge and speaking ability (Khan et al., 2018, p. 414). By observation of primary students' behaviors, it was found that primary students enjoy playing more than learning through lectures. Using games for learning or gamed-based learning (GBL) is a term that is also widespread. One of the popular definitions of GBL is that of Word Wall, Halverson, Shaffer, Squire, and Gee, according to whom it is GBL with defined learning outcomes. This is the difference between GBL and gamification. Gamification is a broad concept, with mandatory game elements such as incentive systems to motivate players to engage in a task they do not find appealing. However, games as an educational method are games oriented to fun, but they are still suitable for use as a tool and method of teaching, which allows students to solve problems and participate in situations. This prompted calls by experts and the Thai Ministry of Education for a better approach that will enhance students' motivation to learn, retain and recall vocabulary naturally via alternative approaches such as GBL which offers a fun and relaxing learning atmosphere to motivate and aid learning in childhood, including in adulthood (Neuman & Wright, 2014 as cited in Taghizadeh et al., 2017, pp. 516-517). For instance, in Tessaban 3 school, 3rd-grade students often show low levels of motivation, and their English vocabulary skills are often inadequate, with most students becoming more passive while others easily conclude that English is a difficult subject. As calls

for alternative approaches to address students' demotivation and ineffectiveness in learning vocabulary in ESL or EFL classrooms grow across the world, educational computer games that are once considered an ideal form of entertainment are now seen as alternative effective instruments that promote students' engagement and fun learning process (Papadakis, 2018, p. 2). This is because it creates a different fun, exciting, creative, and yet challenging learning experience that not only enhances learners' attention, endurance, and problem-solving problems, but also critical and creative thinking and collaboration skills (Abdul & Talib, 2017, p. 79).

Hence, the need for this study to explore the effectiveness of GBL on 3rd graders' vocabulary achievements in Tessaban 3 school was years of using conventional rote methods (for example) limit the students for too long hours of memorization and monotonous translation of vocabulary through books without emphasis on retention and comprehension. The study uses one-minute games, fast vocabulary games, and ESL online games to examine how GBL enhances students' vocabulary achievement by raising two key research questions based on the objectives below.

RESEARCH OBJECTIVES

1. To investigate the effects of GBL on 3rd graders' vocabulary learning achievement
2. To examine students' opinions towards GBL in vocabulary achievement

RESEARCH BENEFITS

1. Is the GBL method effective for improving 3rd graders' vocabulary learning achievement?
2. What do the 3rd graders think about using GBL methods in learning English vocabulary?

Research Hypothesis

The students who learn English via GBL would achieve significantly higher mean scores on the English vocabulary post-test than on the pretest.

Purpose of the Study

The purpose of this study is to test the effectiveness of the use of computer games using the GBL method on 3rd graders' vocabulary learning achievements of students in Tessaban 3 school, Nakhon Ratchasima, Thailand. It also intends to examine students' vocabulary learning achievements via their opinions on how the use of the approach, with emphasis on reading and pronunciation, can contribute to improving 3rd graders' vocabulary learning achievements. This will enable these pupils to overcome one of the major problems posed by the traditional teaching approaches in learning the English language in Thailand.

Literature Review

Current Curiosity in the Use of Game-based Learning (GBL) Practice

Recently, the use of GBL has been seen increasing interest in enhancing English language learning proficiencies, such as reading comprehension, vocabulary learning, vocabulary retention, and motivation, with each study focusing on certain aspects of students' learning needs such as

this study, materials used, methodology, and the researched subjects, etc. So also, the importance of integrating information and communication technology (ICT) into teaching practices and learning remains increasingly popular among most educators (Papadakis, 2018, p. 2). There is also an upward awareness about the usefulness of interactive online games in learning English, even though it is still very unlikely to be integrated into the national curriculum soon. In addition, opinions from stakeholders, guardians, educators, and parents show that computers or online games support valuable learning skill development in students. This is true of its increasing popularity among parents and younger learners (Becker, 2016, p. 219)

Implications of Game-based Learning (GBL) Practice in English Teaching

A result of the inadequacy between the teachers' instructional strategies and the rate at which modern technologies, particularly the Internet have an impact on students' learning styles. Thus, researchers are more interested in trying to find techniques to increase student's attention, and teaching gets to attract more scholarly inquiries. Online vocabulary games are regarded as a good method to have fun while learning new words. The outcome indicates that the experimental group outperformed the control group on the pretest and posttest, indicating the importance of computers in learning and instruction. Using audio-visual cartoon films as the medium for vocabulary instruction, Munir et al. (2016: p. 13) conducted research on the applicability of media in Indonesian elementary school children's vocabulary development. The findings showed that standard techniques are ineffective at encouraging pupils to learn new words and discourage the applicability and use of media in vocabulary instruction.

Likewise, Kathinthong and Adipat (2022, p. 34) Reem and James (2020, p. 65) researched the usefulness of games in enhancing students' mastery of vocabularies with seventh graders using field notes, an observation checklist, and a test and discovered with the topic's vocabulary of daily English communication, people's occupation, and personal care and appearance can improve students' vocabulary mastery achievement. Additionally, in Thai schools where teachers are frequently overburdened with duties, teachers' abilities to become familiar with these games and devise teaching strategies that yield the best results are frequently constrained by time and the struggle on the part of both teachers and students to comprehend how the games work and deal with the amount of irrelevant content that could result in losing valuable lesson time that rather makes learning boring and frustrating.

Consequently, the use of games and the GBL approach in schools is still rare in most parts of the world, including in Thai schools in ICT across the country (Puttimanoradeekul & Phongsatha, 2019, p. 346). This is especially among language teachers who are accustomed to the traditional rote methods of learning. Thus, they are often unfriendly to the idea of incorporating technology into their lessons. Nonetheless, Rodkroh et al. (2019, p. 211) and Papadakis (2018, p. 22) acknowledged

that both teachers and parents recognized that games could support valuable skill development in a student such as strategic thinking, planning, communication, application of numbers, negotiating skills group decision-making, data-handling, the authors, however, observed that lack of consensus among teachers, parents, and students on the use of game during lesson time remains a key challenge.

RESEARCH METHODOLOGY

This study uses a one-group pretest-posttest pre-experimental design with students receiving the game-based learning (GBL) method to examine how the use of GBL can improve the vocabulary achievements of EFL students in Thailand. Pre-experimental designs are research schemes in which a subject or a group is observed after a treatment has been applied, in order to test whether the treatment has the potential to cause change.

Population and Sample

The research population is made up of 90 3rd graders from four classes in Tessaban (municipal) primary school, Nakhon Ratchasima province who study English as a foreign language in the first semester of the academic year 2021 in Thailand. Specifically, cluster random sampling was employed to select the research samples of 33 3rd graders who have a similar background in English proficiency level and abilities based on their English assessment grade report in the previous semester.

Experimental Design and Instrumentation

This study used a pre-experiment, a group pre-test, post-test design. Firstly, the researcher administered an English vocabulary learning achievement test to the participant as a pretest. Then, participants received treatment of English vocabulary based on the four themes for two hours per week. Next, the learners were given an English vocabulary post-test to examine GBL. Finally, a questionnaire survey was issued to all the participants to investigate their opinions towards the treatments, and the theme of the vocabulary and the lesson plan are suitable and are in line with student's quality required in the core curriculum.

Figure 2 Pre-experimental design of the Study

O1	X	O2
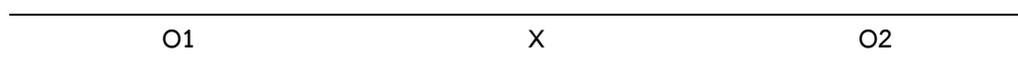
O1 represents the measurement of the student's English vocabulary learning achievement prior to treatment. X represents teaching English vocabulary treatment via GBL. O2 represents the measurement of the student's English vocabulary learning achievement after the experiment and their opinions towards the use of GBL in learning vocabulary. The study made use of four instruments, namely learning materials, a pre-test, a post-test vocabulary achievement test covering

four themes, and a set of questionnaires to gauge the students' opinions. These instruments are classified into two sets namely, 1) instruments for research procedure and 2) instruments used in data collection. The study also used four lesson plans based on the GBL method, which include objectives, language contents, learning activities, teaching materials, and assessments as well as English vocabulary Items. Each week, the researcher taught two periods and play the game for one period (three periods per theme).

Lesson Plans Theme	Activity	Time per Theme
1. Occupation	Teaching and game	3 hours
2. Transportation	Teaching and games	3 hours
3. Weather	Teaching and games	3 hours
4. Clothing	Teaching and games	3 hours

In addition, an English vocabulary learning achievement test (EVLAT), and a questionnaire of students' opinions towards learning English vocabulary using GBL were employed as the main research instrument for the data collection. The EVLAT was conducted to test students' English vocabulary learning achievement (EVLA) prior to the treatment for themes that the teacher addressed during the treatment. Next, a 60-item English vocabulary achievement test was designed. After that, the English vocabulary learning achievement test was presented to the thesis adviser to evaluate its suitability to grade three students' abilities and the research objectives as well as the accuracy of the contents, and language level of the students. The test was revised according to the comments from the thesis adviser, and later presented to 3 experts to examine the suitability of the language, and content validity and rate whether it is congruent with the research objectives. Then, the index of item-objective (IOC) was calculated. The item-objective congruence index is as follows: Congruent = 1, Questionable = 0, and Incongruent = -1 (Rovinelli & Hambleton, 1977, unpaged). In addition, the English vocabulary learning achievement pretest was revised and edited to accommodate the experts' recommendations. The result was analyzed for difficulty index (p), including the discrimination index (r) and reliability. The test was then re-edited once again before the experimentation with the samples.

Questionnaire

The study primarily focuses on assessing the participants' perceptions of the treatment when creating the questionnaire (learning English vocabulary through GBL). To replicate the TAM (technology acceptance model) developed by Davis, closed-ended questions and open-ended questions questionnaires were used (Vodenicharova, 2022, p. 745). These factors included perceived usefulness, perceived ease of use, attitude towards using, and behavioral intention to use technology.

Data Collection

The collection of the data took place in the first semester of the academic year 2021. Prior to the treatment, one class received a pretest to examine their English vocabulary learning achievement. Next, the lesson plans were implemented with the students. The participants took the post-test to check their vocabulary learning achievement after the treatment. The questionnaire was then issued afterward to collect participants' opinions about learning English vocabulary through GBL. To collect the data, the participants received a vocabulary learning achievement test as the pretest before the treatment. The participants received an (EVLAT) as the post-test and a questionnaire to evaluate their opinions. The collected data was then analyzed using descriptive statistics to show students' EVLA based on their responses. Mean (X), Standard deviation (S.D), and inferential statistics were used to compare students' English vocabulary learning achievement prior to and after the treatments by using a t-test for a dependent.

Pre-test and Posttest

Each pre-test and post-test comprised 60 vocabulary questions designed to cover the four vocabulary themes taught to the students. To cover all four themes, the question paper consisted of four parts (transportation, clothing, weather, and occupation) subsections A, B, C, D, and so on, with a total of not less than 15 questions in part. Each section is meant to examine the students' comprehension, information gap filling, word matching for recalling skills, and spelling skills based on the assigned pictures. The researchers used the tests to examine the pupils' vocabulary learning achievement before and after receiving the GBL learning methods treatments.

Research Procedure

Before introducing the game to students, the researcher, first, familiarizes herself with how to use the game in a lesson plan by knowing why and what the participants are expected to complete, and how the game assists both the teacher and students to attain the lesson's objective and ensures that the group activities are tailored towards reviewing and reinforcing the content learned. After that, 3 games with an intuitive interface that suits the student's learning abilities were selected namely, 1) the one-minute games, 2) fast vocabulary games, and 3) ESL online games. The researcher also ensures that the games suit the student's abilities and lesson objectives. The essence is to test students' abilities to answer the questions and the adaptability of the games to the various learning styles of the students.

Once 3 steps are firmly established and the choice of games made, prior to the third period, each individual game was introduced as an entry point into the day's lesson for all students to have a chance to complete a challenge or solve a problem before moving into the rest of the class. In the subsequent class, the researcher taught them the vocabulary lessons, then explained, and showed how to play these games to the pupils. In the last period of each theme's lessons (the third period), the researcher used the games and allowed students to

undergo the GBL. Students completed the tasks individually, earning points and passing levels to achieve the learning goals.

After 12 weeks, students' opinions of the GBL questionnaire based on students' (a) Student background, (b) Desire to use the Technology (Intention) in learning English vocabulary, (c) Students' attitude toward technology (computer/digital games) in learning English vocabulary, (d) Students' perceived usefulness of GBL in learning English vocabulary, and (e) Students' perceived ease of use of GBL in learning English vocabulary were collected. The questionnaire used five Likert-type items arranged from "strongly disagree" to "strongly agree" as the endpoint. The instrument shows high reliability as seen in Table 1 below, with a Cronbach Alpha value (α=0.83).

Table 2 Reliability Test Result (Cronbach Alpha)

Construct	α.
- Desire to apply Technology (Intention) in learning English vocabulary	0.84
- Students' attitudes toward technology (computer/digital games) in learning English vocabulary	0.82
- Students' perceived usefulness of GBL in learning English vocabulary	0.82
- Students' perceived ease of use of GBL in learning English vocabulary	0.83
Total	**0.83**

This shows that the questionnaire instrument used is suitable for this research. Prior to assigning the post-test and questionnaires to measure the students' vocabulary achievements, the researchers checked the post-test papers and recorded the result along with the findings of the questionnaire.

RESEARCH RESULTS

In this study, to evaluate the effect of the GBL method on students' English vocabulary achievement students who receive the treatment, the study used the English Vocabulary Achievement Analysis of Covariance (ANCOVA).
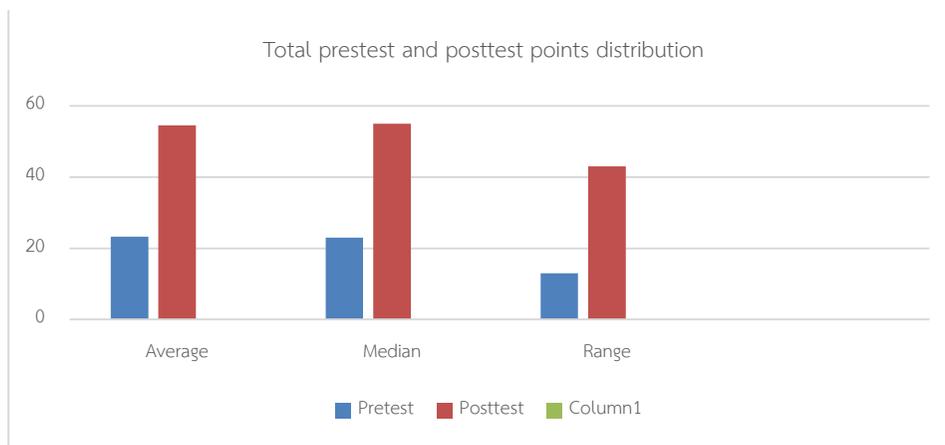
Figure 1 The pretest and posttest result in total points distribution.

The study shows that the Achievement Analysis of Covariance (AAC) has higher English vocabulary achievement after manipulating the difference in pre-test scores. Hence, to control the difference in the participants' initial achievement, the pre-test achievement score was used as covariance. The study also took the assumptions of covariance analysis such as a) direct relationships between the covariates and the dependent variable, b) independence of observations, c) homogeneity of variances, d) normal distribution of the dependent variable, (e) homogeneity of regression slopes were also examined, with all the assumptions confirmed fulfilled. Accordingly, this is indicative of table 3, descriptive statistic English vocabulary post-test achievement score for students from the GBL method (M=76.83).

Table 3 Students' perspective in using GBL learning vocabulary

Construct	Mean	Standard deviation
a. Students' desire to use Technology (Intention) in learning English vocabulary	4.40	0.86
b. Students' attitudes toward technology (computer/digital games) in learning English vocabulary	4.14	0.91
c. Students' perceived usefulness of GBL in learning English vocabulary	4.43	0.72
d. Students' perceived ease of use of GBL in learning English vocabulary	4.28	0.80

In other words, as seen above, a significant difference existed between the student achievement of English vocabulary using GBL practice after controlling for pre-test achievement score (Average 23.27/54 points, Median 27/55 points, and range 13-44 points), which affected the controlled variables (the pre-test achievement score) more significantly than the post-test achievement score (Average 54.51/60 points, Median 55/60 point, and range 43-60 points) of the students. Thus, the manipulation (controlling) of the students' pre-test achievement scores reveals that the GBL learning method showed a positive effect on the students' post-test achievement scores significantly.

DISCUSSION

The results of the study indicate that students considerably increase their achievement in English vocabulary, as seen by the discrepancies between the pretest and post-test. The application of the GBL method significantly enhanced EFL English language achievement more than the use of conventional methods such as the paper-based games learning (PBGL) technique. This research, therefore, assumed that the games used in this study are very effective in promoting students' active participation and engaging the pupils in achieving the desired learning goals. This is particularly true given the combination of the games' feature selection and the language teaching content that has been chosen. For instance, one of the study's participants liked GBL because its objectives are unmistakably positioned within an expressive context. She also confirmed that the sound, animation, and graphics in the games excite and maintain her and her friends' attention on the duties while playing the games. Another student revealed that the games offered them the power to control their speed and that progressive challenging levels of the games provide the pupils with the automatic feedback required to measure their abilities to meet the desired learning goal of the lessons through their progress via the score or points earned.

The use of GBL also provides students with the opportunity to make mistakes and learn from them without worrying about failing due to subpar marks in a traditional learning environment. For instance, after a few setbacks, some students become accustomed to the games and are able to perform better and earn higher marks. However, even before the post-test was given to the students, they were able to successfully accomplish the game tasks thanks to the automatic feedback and assessment cycles, as well as through working together with their fellow classmates and the researcher. Thus, after the initial encounter and after a task cycle has been successfully completed using a number of ways, vocabulary learning becomes effective, GBL approach also offers learners crucial experiences that learners could hardly gain from traditional classrooms such as experimentation, exploration, trial and error, imagination, role play, and simulation of experience suggesting that it might be possible to develop environments for learning based on these activities.

According to the result from the questionnaire administered to students on their opinion on the use of the GBL method, the pupils proved to be initiative-taking and kept positive opinions towards the use of GBL in learning English vocabulary. Students are incredibly positive towards GBL application in learning English vocabulary. The study thereby concludes that computer games are especially useful tools and should be encouraged to be used by teachers in teaching English vocabulary.

The study also discovered that the fun factor that GBL adds to the learning environment encourages students to work harder and pay greater attention to the activities being done. Additionally, they read more fluently and easily develop stronger recall, comprehension, and

reading abilities. The study also found that 3rd graders enjoyed the feeling of independence they gain from using GBL to learn English vocabulary, especially when the games they choose are well-explained and appropriate for their level of English vocabulary proficiency. The study's overall conclusion is that GBL techniques are a superior replacement for the traditional teaching methods now used in EFL classrooms and that language teachers should embrace their use.

Conclusion

The test results suggest that there exist major effects of the independent variable (the application of GBL learning practice) on the dependent variable (students' vocabulary achievement in post-test) when the pre-test was manipulated. Hence, the GBL method or practice potentially offers a more pleasurable and effective learning environment to these 3rd graders in learning English vocabulary. As noted by the students, the considerable differences in their pretest and post-test results revealed that the game features (challenges, controls, interactivity, and feedback) give created a fun and relaxing learning environment that is supportive of enhancing the students' interim and long-term recollections in order to remember, retain, and recall the learned vocabulary, thereby, enhancing their vocabulary learning achievement. The results also reveal that the use of GBL is beneficial and well received as a suitable application for strengthening and enriching vocabulary exercises by the 3rd graders. As Taghizadeh et al. (2017, p. 56) noted, GBL improves comprehension and strengthens students' memory of a subject taught to students. Hence, this study concluded that GBL may not serve as the golden bullet to students' vocabulary problems, but it, however, has the potential to serve as an effective solution to the low English performance or vocabulary mastery among primary school children and should be considered as a viable alternative to the traditional approach to delivering and implementing listening and speaking lessons by EFL teachers.

However, there may be drawbacks to employing game-based learning techniques in our instruction in addition to their many advantages. First and first, it's crucial to think about whether these tools or games advance learning or serve their specific functions. To overcome the constraints of the technology itself on students' learning, it is necessary to seriously evaluate students' technological aptitude. To effectively teach and interest players in learning, game creation is challenging and may require access to e-learning design abilities, which are rare among teachers.

Finally, like other lesson planning processes, using GBL requires considerable time, financial or moral support from the administrator, resources, and better planning to develop a good game tailored to meet students learning needs, not just in the short-term, but in the long term.

Scope and limitations of the Study

The study covers only 3rd graders. This population may not be representative of all 3rd graders' experience and opinions on the use of GBL towards vocabulary learning achievement in Thailand, thus, the findings could not be generalized to all grade three EFL students in Thailand. The Covid-19 epidemic is one of the most important restrictions. For instance, the research was

done online because schools had to close. Another drawback is the gender neutrality of the study and the briefness of the experiencing period. For instance, guys in the same classroom are more likely than girls to be expected to play games, show a tendency for action, crave adventure, and be drawn to violent computer games. The use and selection of computers by students, as well as their preferences for games' themes, are all heavily influenced by gender. Future research that might extend longer and have a larger sample size is necessary to determine whether this difference can affect the outcomes.

Significance of the Research

This research employed the GBL to explore a new way for its implementation by focusing on students' vocabulary achievement. The idea is to explore alternative methods that will enhance English vocabulary learning achievement by incorporating the target vocabularies in a clear, motivating, and interesting way to acquaint students with GBL teaching practice. The research will also help Thai English educators and EFL teachers better understand Thai students' problems in developing their English vocabulary proficiency, ignite EFL learners' enthusiasm, and serve as a new way for Thai EFL learners to improve their vocabularies.

It also serves as a guideline for teachers to explore the usefulness of computer games in teaching vocabulary to students via GBL. Moreover, GBL serves as a better, innovative, creative, fun, and interesting alternative for Thai EFL learners to enhance their vocabulary learning achievement and contributes to pedagogical development both in the interim and in the long run.

SUGGESTIONS

Recommendation for Future Research

It is advised that some gamification components be added to EFL lectures to help students have a more enjoyable and engaging learning experience. When students' efforts and mistakes are intuitively rewarded with points, success badges, levels, progress bars, free coins, countdowns, etc., it will increase their motivation, and enthusiasm, and encourage active attentiveness and engagement in the learning process.

The study also recommends that there is a need for further research on the likely impact of GBL on EFL students' learning achievements in writing, reading and comprehension, and grammar as well as replicating it in all other foreign language classrooms in Thailand.

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