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THE APPLICATION OF GAME-BASED LEARNING WITH MULTIMEDIA TO IMPROVE CHINESE VOCABULARY LEARNING ABILITY OF GRADE SIX THAI STUDENTS AT A SCHOOL IN NONTHABURI THAILAND

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Abstract

This study aimed to 1) compare the Chinese vocabulary learning ability of grade six Thai students before and after using game-based learning with multimedia. 2) examine grade six Thai students' satisfaction towards game-based learning with multimedia for Chinese vocabulary learning. Quantitative data were collected through Chinese vocabulary tests and student satisfaction questionnaires and were analyzed using a sample t-test, mean score, and standard deviation, while qualitative data were obtained from semi-structured interviews and analyzed by inductive analysis.

The results showed a significant improvement in students' vocabulary learning ability. Satisfaction questionnaire results indicated high levels of student on interest and motivation, engagement, and effectiveness of game-based learning with multimedia. Semi-structured interview responses further supported these findings, as students expressed strong satisfaction with this learning method. Therefore, the results of this study clearly show that the application of game-based learning with multimedia improves the Chinese vocabulary learning ability of grade six students.

Keywords: Game-Based Learning With Multimedia, Chinese Vocabulary Learning Ability, Grade Six Thai Students, Students' Satisfaction

Introduction

With the overall improvement of the Chinese comprehensive strength, Many Thais are paying more and more attention to Chinese learning, and Thai students' demand for Chinese curriculum is also increasing. The main feature of teaching Chinese as a foreign language is the emphasis on vocabulary teaching, which plays a vital role in the multifaceted trajectory of Chinese acquisition. The vocabulary required to communicate in another language is very large for both teachers and learners (Schmitt, 2010). The scale of this vocabulary demand becomes apparent when students struggle to cope with the complexity of learning a new language, and innovative and effective teaching methods are needed to master this language environment and improve language proficiency.

According to the report from the Hanban Thailand Office (2015), Thailand has emerged as one of the leading nations in Asia with a substantial population of Chinese language learners. It is noteworthy that Chinese language learning curriculum has become prevalent in numerous educational institutions throughout Thailand, spanning from kindergarten to primary and secondary schools.

Vocabulary learning is crucial in Chinese language education because it significantly impacts the success of language teaching. With increasing cultural exchanges between China and Thailand, the importance of vocabulary learning is more evident (Le Ngoc et al., 2021). Vocabulary acquisition in Chinese requires substantial input from learners and remains a pressing issue that needs addressing (Lee and Yeung, 2018). Therefore, when teaching Chinese to Thai students, vocabulary should be the focus and should be integrated throughout teaching activities (Xu, 2013).

As a teaching method, Game-Based Learning (GBL) has shown unique advantages in improving students' learning outcomes with its interactivity and immersive experience. (Hartt, Hosseini and Mostafapour, 2020). A variety of learning methods can stimulate students' learning motivation and enable them to actively participate in the process of exploring knowledge. Game-Based learning can help students build self-confidence in a simulated practical environment, thereby effectively improving learning efficiency. The interactive nature of game-based learning helps students communicate and cooperate effectively in teams, allowing them to learn knowledge that is difficult for individuals to master independently in collaboration. (Liu, Shaikh and Gazizova, 2020).

Game-based learning with multimedia can significantly enhance the learning experience and the effect of the learning episode to students. Multimedia elements play a key role in promoting understanding and reducing cognitive load in GBL. Multimedia elements in games can better immerse students in the learning situation, while optimizing the efficiency of information transmission, thereby improving learning performance and concentration.

In addition, with the application of knowledge to specific game tasks, students can effectively transform theory into practice more, thereby deepening their understanding of knowledge (Adipat, Laksana, Busayanon, Asawasowan and Adipat, 2021). This problem solving and task completion in game situations strengthens the memory of learning content.

As mentioned above, game-based learning with multimedia integration into Chinese teaching is an effective way to improve vocabulary skill. However, the application of multimedia in Chinese teaching in Thailand is relatively limited. Therefore, this study hopes to apply game-based learning with multimedia to Chinese teaching to improve the Chinese vocabulary and satisfaction of Thai sixth-grade students.

Objectives of this Research

1. To compare Chinese vocabulary learning ability of grade six Thai students before and after using game-based with multimedia.

2. To examine grade six Thai students’ satisfaction towards game-based learning with multimedia to Chinese vocabulary learning ability.

Research Methodology

1. Research Design

This study used quantitative data collection methods, including Chinese vocabulary test, students’ satisfaction questionnaire and semi-structured interview. The vocabulary test used a combination of pre-test and post-test to assess students' mastery of Chinese vocabulary before and after learning through game-based learning with multimedia. The satisfaction questionnaire was designed to assess students' satisfaction with the multimedia learning process and measure the effectiveness of game-based learning with multimedia in improving Chinese vocabulary acquisition.

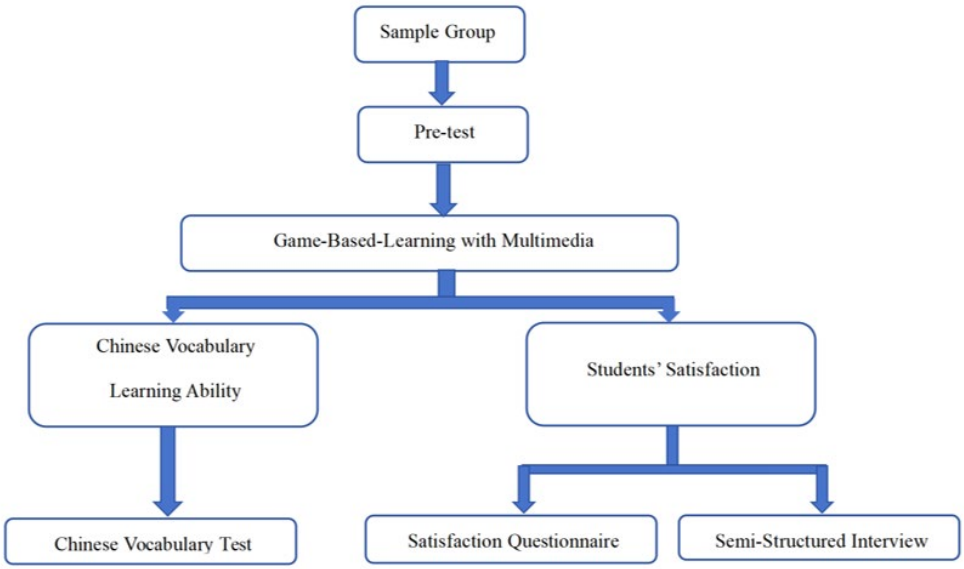

Figure 1 Flow of Research Design

2. Research Instruments

This study will use four research instruments to collect quantitative data: lesson plans, Chinese vocabulary tests (pre-test and post-test), students' satisfaction questionnaire, and semi-structured interview.

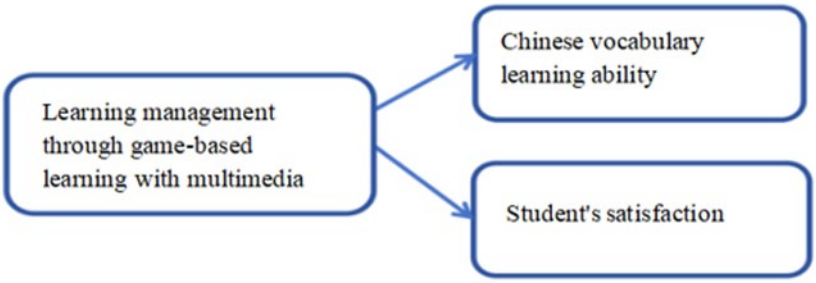

Figure 2 Relationship of variables

3. Lesson Plans

The designed four 80 minutes lesson plans from the Grade six textbook "I Love Chinese language on four topics." The lessons were conducted twice a week for a total of 8 sessions. The researcher taught twice a week for 4 weeks. Each class session is 40 minutes.

4. Achievement Test

In order to compare the vocabulary level of the sample group before and after

application game-based learning with multimedia, the Chinese vocabulary test will be divided into a pre-test and a post-test. The test content covers two parts: listening and comprehension. The total score is 20 points.

5. Questionnaire

The students' satisfaction questionnaire was used to investigate students' satisfaction with learning Chinese vocabulary through game-based with multimedia. The student's satisfaction questionnaire is divided into three parts: interest and motivation, engagement, and effectiveness of game-based learning with multimedia.

6. Validity and Reliability

In this study, a rigorous validation process was undertaken to ensure the credibility of all research instruments before they were applied. To thoroughly assess the effectiveness of these instruments, the study used the Item Objective Congruence (IOC) index as a key metric. The IOC score, ranging from -1 to +1, evaluated the alignment between the research instruments and their intended objectives.

Reliability referred to the ability of a measurement tool to stably and consistently provide similar results at different times, in different environments, or under different test conditions. This indicated that the results of the measurement tool were not significantly affected by random errors or external factors and can thus reliably reflect the measured characteristics or variables. Ensuring the reliability of the data and the credibility of the research conclusions.

7. Population and Sample

The study's target population consists of 57 students from two Grade six classes. Students aged 11 to 12 have different backgrounds, genders, and learning abilities. The sample group selected through clustered random sampling consisted of 28 students (14 female and 14 male) with different backgrounds, genders, and learning abilities.

8. Data Collection Procedures

To conduct the study within schools, the researcher first obtained approval from Rangsit University. Given that the participants are aged between 11 and 12, additional permissions were also sought from the relevant school department and the parents or guardians of the students.

The researcher ensured that all information related to students' personal

information and responses to the satisfaction questionnaire were kept confidential. Furthermore, all data will be deleted after the completion of the study.

9. Data Analysis and results

In order to compare students' Chinese vocabulary after learning through game-based learning with multimedia, we collected information through a pre-test and a post-test. The collected data were then analyzed using t- test for dependent sampling.

In order to investigate students' satisfaction about using game -based learning with multimedia, we collected data using students' satisfaction questionnaire and semi-structured interview for supporting the idea. Statistical analysis of students' responses to each item was performed using the mean and standard deviation.

Research Results

1. To compare Chinese vocabulary learning ability of grade six Thai students before and after using game-based with multimedia.

1.1 The results indicated that students significantly improved their Chinese vocabulary learning ability after using game-based learning with multimedia. The average pre-test score was 10, which increased to 16.4 in the post-test, showing a 32.14% overall improvement. The highest individual improvement was 55%, while the lowest was 20%.

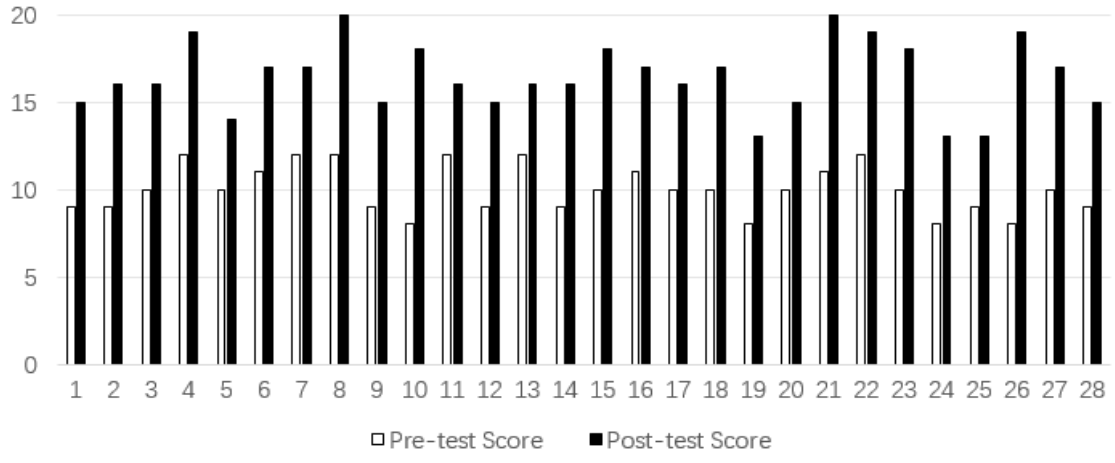

Figure 3 Pre-test and Post-test

1.2 The statistical analysis confirmed that the improvement in students' performance was significant, indicating the effectiveness of game-based learning with multimedia. The mean difference between the pre-test and post-test was 6.4 points, with a t-

value of -19.4 and a p-value < .000, indicating that the enhancement in students' scores was highly unlikely to be due to chance.

Table 1 T-test Results

	N	Mean	S.D	t	Sig.
Pretest	28	10	1.36	-19.4	<0.001
Posttest	28	16.4	1.99		

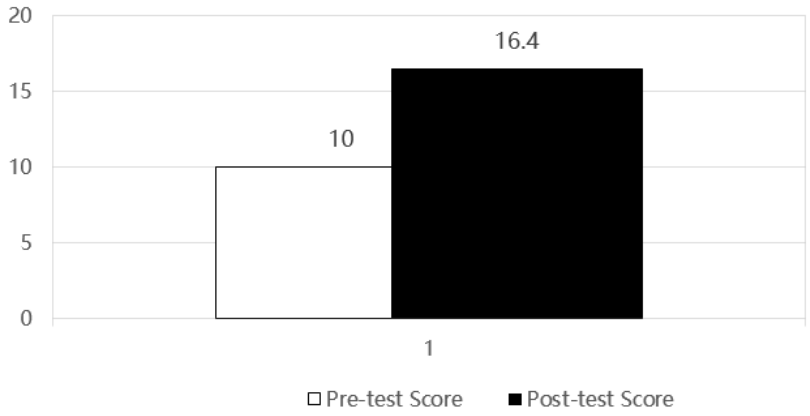

Figure 4 Average of Pre-test and Post-test

2. To examine grade six Thai students' satisfaction towards game-based learning with multimedia to Chinese vocabulary learning ability.

2.1 The satisfaction questionnaire results showed that all three parts (Interest and Motivation, Engagement, and Effectiveness) received "Strongly Satisfaction" ratings. This indicates that students had a very positive experience with game-based learning using multimedia.

Part A: Interest and Motivation in game-based learning with multimedia. Item 2, "Chinese vocabulary learning through game made learning Chinese more interesting," had the highest mean score ($\bar{x}$ = 4.61, SD = 0.49), indicating that students found this method particularly engaging and enjoyable. which confirmed that students were highly motivated and interested in learning Chinese vocabulary through game-based multimedia methods.

Table 2 Part A

Part A: Interest & Motivation	**Mean**	**S.D.**	**Interpretation**
1 Game-based learning with multimedia classes made me look forward to Chinese vocabulary classes.	4.54	0.5	Strongly Satisfied
2 Chinese vocabulary learning through game made learning Chinese more interesting.	4.61	0.49	Strongly Satisfied
3 The use of media in teaching appealed to me.	4.46	0.51	Strongly Satisfied
4 Through game activities in class helped me remember new Chinese vocabulary.	4.46	0.51	Strongly Satisfied
5 I preferred learning Chinese through game.	4.32	0.48	Strongly Satisfied
Average	**4.48**	**0.50**	**Strongly Satisfied**

Part B: Engagement game-based learning with multimedia, Item 6, "Multimedia made me more willing to learn Chinese in class," had the highest mean score (x = 4.68, SD = 0.48), indicating that students found multimedia highly effective in increasing their willingness to engage in learning. These findings suggest that integrating multimedia and games into language learning effectively enhances student engagement, making learning more interactive and enjoyable.

Table 3 Part B

Part B: Engagement	**Mean**	**SD**	**Interpretation**
6 Multimedia made me more willing to learn Chinese in class.	4.68	0.48	Strongly Satisfied
7 I liked to participate in game activities.	4.18	0.72	Strongly Satisfied
8 Playing games with multimedia made me more focused.	4.39	0.62	Strongly Satisfied
9 Game activities made me more willing to cooperate with classmates to complete tasks.	4.25	0.7	Strongly Satisfied

10 Through games I could complete the exercises in class more actively.	4.40	0.9	Strongly Satisfied
Average	**4.38**	**0.68**	**Strongly Satisfied**

Part C: Effectiveness. Item 12, "Multimedia helped me understand the learning content better." garnered the highest mean score (x = 4.46, SD = 0.74), indicating that students found this method very effective. The overall results showed that students believe game-based learning with multimedia was effective in improving vocabulary skills and making learning more engaging and enjoyable.

Table 4 Part C

Part C: Effectiveness	**Mean**	**SD**	**Interpretation**
Game-based learning with multimedia has helped me improve my Chinese vocabulary skill a lot.	4.32	0.72	Strongly Satisfied
Multimedia helped me understand the learning content better.	4.46	0.74	Strongly Satisfied
Learning new vocabulary through games was more effective.	4.25	0.75	Strongly Satisfied
Game activities helped me remember Chinese vocabulary faster.	4.14	0.80	Strongly Satisfied
Learning through game-based learning with multimedia gave me confidence in my future Chinese vocabulary learning.	4.18	0.81	Strongly Satisfied
Average	**4.27**	**0.76**	**Strongly Satisfied**

2.2. The semi-structured interview analysis revealed that students had a positive experience learning Chinese vocabulary through game-based learning with multimedia. This method made the learning process more engaging, sparked their interest, and motivated them to participate actively in class.

Part A: Interest and Motivation

Based on student feedback, most participants expressed strongly satisfaction

with game-based learning with multimedia for learning Chinese vocabulary. They found it enjoyable and motivating. Many students mentioned that the interactive nature of the games kept them focused and made learning new words easier. Additionally, they appreciated the use of visuals and sounds, which helped them remember vocabulary more effectively.

Part B: Engagement

Students generally responded positively to game-based learning with multimedia, stating that it made them more engaged and active in class. Many mentioned that the interactive nature of the games encouraged participation, teamwork, and concentration. The competitive elements and real-time feedback in the games also motivated them to stay focused and complete learning tasks more effectively.

Part C: Effectiveness of Game-Based Learning with Multimedia

Students shared that learning Chinese vocabulary through game-based activities with multimedia was very useful. They found that games made learning more engaging, helped them remember words better and increased their confidence in using new vocabulary. Many students also said that playing games made studying feel less stressful and more enjoyable.

Research Discussion

This study aimed to improve the Chinese vocabulary learning ability of Grade 6 Thai students through game-based learning with multimedia. To evaluate its effectiveness, a pre-test and post-test were conducted, and students' satisfaction and learning experiences were analyzed using questionnaires and semi-structured interviews. The results of this study confirm that game-based learning with multimedia significantly enhances vocabulary acquisition, increases student engagement, and improves learning motivation.

1. The Result of Chinese Vocabulary Test.

1.1 The average post-test score was significantly higher than the pre-test score, showing a substantial improvement in students' vocabulary knowledge.

1.2 The highest and lowest scores both increased after using game-based learning, indicating that students at different performance levels benefited from this method.

1.3 All students showed progress, with individual score increases ranging from a few points to more than ten points, demonstrating that this approach was effective for all learners.

1.4 Before the implementation of game-based learning, no students achieved a high score, but after using this method, most students scored significantly higher, reflecting overall improvement in vocabulary acquisition.

These results suggest that game-based learning with multimedia is a powerful tool for enhancing students' vocabulary learning, leading to better retention and application of new words.

2. The Result of Students' Satisfaction.

The second objective of this study was to examine the satisfaction of grade six Thai students with game-based learning using multimedia for Chinese vocabulary learning. Quantitative data was collected through a questionnaire containing 15 items, divided into three parts:

Part A: Interest and Motivation

Part B: Engagement

Part C: Effectiveness of Game-Based Learning with Multimedia

2.1 Students showed a strong interest and motivation in learning vocabulary through interactive games, as they found the lessons more enjoyable and engaging.

2.2 The use of multimedia and game-based elements kept students actively involved in the learning process, leading to higher engagement during lessons.

2.3 Students believed that game-based learning was highly effective in helping them remember and apply new vocabulary, as it provided a fun and interactive way to reinforce learning.

Overall, the results suggest that students were highly satisfied with game-based learning with multimedia, as it increased their motivation, encouraged active participation, and improved their vocabulary learning experience.

Research Body of Knowledge

The figure presents the framework model of game-based learning with multimedia, which serves as the foundation of this study. It illustrates key components, including various multimedia elements (videos, pictures, PowerPoint, and music), as well as related instructional approaches such as the flipped classroom model, blended learning approach, and multimedia task-based language learning.

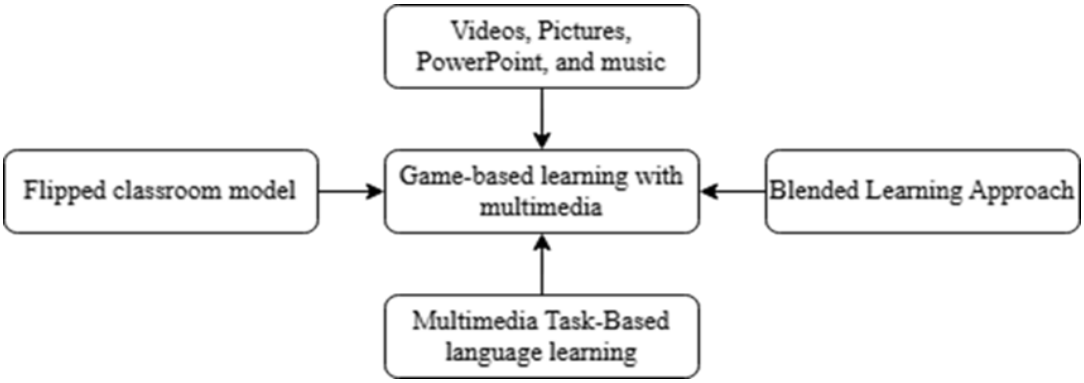

Figure 5 Knowledge framework

Research Suggestion

1. Recommendation for Implementation.

1.1 Expand Game-Based Learning Across More Lessons and Grade Levels.

This study focused on a limited number of vocabulary lessons, but game-based learning can be applied to a wider range of topics and different grade levels to achieve more comprehensive learning outcomes.

1.2 Increasing the Use of Multimedia Tools and Interactive Elements.

The positive feedback from students highlights that multimedia-based games create an engaging and interactive learning environment. To maintain student motivation and participation, teachers should incorporate more digital tools, interactive games, and multimedia elements into vocabulary instruction.

1.3 Ensure a Balance Between Entertainment and Educational Goals.

While game-based learning is effective, it is essential to balance entertainment with educational objectives. Teachers should carefully design game activities to align with learning goals, ensuring that students remain focused on vocabulary acquisition rather than being distracted by gameplay. Educators can maximize the educational value of game-based learning.

2. Recommendations for Future Research.

Although this study shows that game-based learning with multimedia has positive effects on Chinese vocabulary learning ability, there are still areas that need further research:

2.1 Long-Term Retention and Learning Outcomes.

This study mainly focused on short-term vocabulary improvement and student satisfaction. Future research could look at how well students remember the vocabulary they have learned over time and whether game-based learning helps with long-term language development. Long-term studies could provide more information about the lasting effects of this method.

2.2 Impact on Other Language Skills.

The study focused on vocabulary learning, but future research could explore how game-based learning affects other language skills such as reading, writing, pronunciation, and listening. This would help researchers understand the broader impact of multimedia games on overall language proficiency.

2.3 Larger and More Diverse Sample.

This study was conducted with a small group of students from one school. Future studies could include a larger and more varied group of participants, from different schools, age groups, and educational backgrounds. It would also be helpful to explore how game-based learning works for students with different learning styles or needs, so the methods can be adapted for diverse groups of learners.

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