



**THE DEVELOPMENT OF CHINESE VOCABULARY LEARNING
USING THE APPLICATION OF QUIZLET FOR GRADE 5
STUDENTS IN THAILAND**

**BY
ANNA FAN**

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT
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Thesis entitled

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Abstract

The study aimed to compare grade 5 Thai students' Chinese vocabulary learning before and after using the Quizlet application and to investigate their satisfaction. The study employed a cluster random sampling of 26 grade 5 students from three classes with mixed gender and learning abilities. The quantitative data were collected through four lesson plans, Chinese vocabulary learning tests (pre-test and post-test), and a student satisfaction questionnaire. The data were analyzed using a paired sample t-test for the first research objective and the second one based on mean and standard deviation (SD).

The research result showed that the Chinese vocabulary learning improved significantly, the post-test scores (\bar{x} =34.08, SD = 6.90) were significantly higher than the pre-test scores (\bar{x} =22.12, SD=7.72). Additionally, the obtained p - value was .01, which was less than .05 ($p < .05$), indicating a statistically significant improvement in Chinese vocabulary learning. Furthermore, the data collected from the students' satisfaction questionnaires showed that all items received in the highest ratings from the participants, indicating that the students were satisfied with the Application of Quizlet.

Therefore, this study clearly demonstrated that the Application of Quizlet could improve the students' Chinese vocabulary learning and their satisfaction.

(Total 132 pages)

Keywords: The Application of Quizlet, Chinese Vocabulary Learning, Grade 5 Thai Students and Students' Satisfaction

Student's Signature Thesis Advisor's Signature

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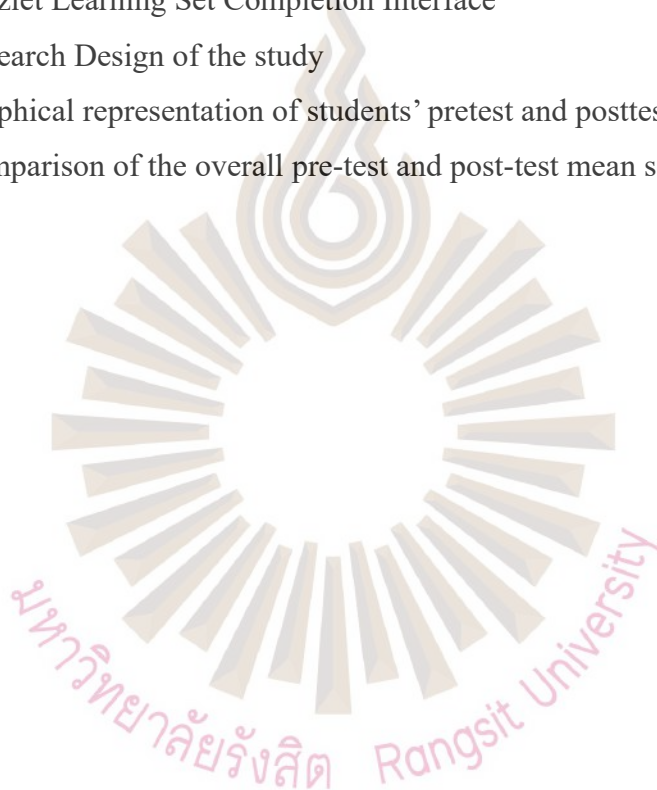


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CHAPTER 1

INTRODUCTION

1.1 Background and Rationale of the Study

With the globalization of the economy and the increasing international status of China, the status of Chinese among the world's languages has also increased significantly. There is a growing demand for people from all over the world to learn Chinese and understand China. According to data released by the Chinese Ministry of Education in 2021, by the end of 2020, Chinese language education will be available in more than 180 countries and regions worldwide, and more than 70 countries will have incorporated Chinese into their national education systems. More than 20 million people in foreign countries are learning Chinese, and the cumulative number of people learning and using Chinese is approaching 200 million (Wu, 2021).

As a country with close economic and cultural exchanges with China, Thailand is also gradually incorporating the Chinese language into its national education system. More and more Thai schools are offering Chinese language courses and making them compulsory, and Chinese language education is gradually expanding from universities to primary and secondary schools. According to the Thai Ministry of Education, more than 2,000 primary and secondary schools in Thailand offer Chinese language courses, and more than one million people are studying the language. Chinese has become Thailand's second most-spoken foreign language after English (Fu, 2021).

In recent years, the business of Chinese language teaching in Thailand has been developing well, but there are also many hidden problems. Firstly, Chinese language teaching in Thailand shows a trend of underage. Li (2018b) points out that

the global movement of Chinese language learners is young, and the low age of Chinese language learners is not a national phenomenon but is reflected in all countries in the world. Still, the typical age in Thailand is a cause for concern because the low age level in Thailand has exceeded 60% and is developing faster.

Different scholars have done a lot of research on the current situation of low-age Chinese learners in Thailand. For example, Sheng (2019) looks at Chinese language studies from the perspective of the low age of overseas Chinese language learners and argues that young Chinese learners' Chinese learning suffers from a lack of learning interest, little teaching and learning of Chinese, and other problems that need to be addressed: resources and weak language functions. One of the reasons is that they need to pay more attention to the younger characteristics of Chinese learners. Yu (2020) points out that Thai primary and secondary school students have a lax attitude toward learning; most Thai students are not under pressure to learn and have poor awareness in class; secondly, most Thai students are lively and cheerful. Students spend most of their time speaking freely in class, and teaching could be more efficient. Thirdly, although students have poor learning autonomy and dislike learning, they are hands-on and are not enthusiastic about the single-knowledge lecture sessions in the teacher's classroom.

Secondly, the problem of Chinese language difficulties. Chinese characters have a long history of thousands of years. In addition to having the characteristic four-square shape, every Chinese character contains pronunciation and meaning and has been formulated with a clear writing structure. Learning Chinese characters has become a difficult task for students. Especially for Thai students whose mother tongue is a phonetic script, Chinese characters are like a mysterious picture, and many immediately become averse to learning at the sight of curved Chinese characters. Hence, learning Chinese characters is a challenging learning obstacle for most international students to overcome (Shi, 2023).

Gao (2022) found that the mother tongue impacts students' ability to analyze the structure of Chinese characters. The transfer of the mother tongue is a factor that

affects second language learning; Thai is a phonetic script that can spell out the sound of the word directly from the word form and then relate it to the meaning of the word, whereas this is not the case with Chinese. This situation is reflected in the difference in the cognitive function of the language. For students new to Chinese, it is common for them to have problems writing Chinese characters with multiple crosses and dots or incomplete writing. Some characters with complex structures can cause other issues for students new to Chinese, or worse, affect their cognitive ability to write and use Chinese characters. Guo (2021) also found that when Thai students first encountered Chinese characters, they were uncomfortable with the structural form of Chinese characters, unable to understand the rationale of Chinese characters, and influenced by their native Thai script; they only saw them as squares made up of curved, straight lines and other dotted lines. They could not perceive Chinese characters because they could not develop a visual memory for learning Chinese characters.

Furthermore, Thai and Chinese belong to the same Sino-Tibetan language family and are tonal languages, which have advantages and disadvantages when teaching Chinese to Thai students. Zhang and Peng (2021) point out that Thai students should be influenced by the different tones of their mother tongue. When teaching tones to Thais, they have some understanding of what tones are and how the tonic values and tone shapes are described, and introducing Chinese tones is relatively easy. The disadvantage is that Thai has five tones, and Chinese has four tones. When learning Chinese, students are often influenced by the tone value and shape of their mother tongue and have problems such as not having a high enough tone value and not being able to pronounce the zigzag tones. Yang (2019) taught Chinese phonetics to 42 students in the 2019 class of the Faculty of Humanities at the University of Sinanakalimvelo and conducted phonetic correction training. The test revealed that the learners had problems with rhymes, consonants, tones, overall spelling, and phonological changes in speech flow.

Thirdly, we often encounter "bottlenecks" in teaching materials, methods, and equipment. Wang (2015) points out that the current Chinese language syllabus in Thailand is ambiguous and imperfect, which has a negative impact on learners at all

stages, i.e., starting from zero; many primary school students, secondary school students, and even university students are learning the same content over and over again. According to Chen (2013), there are several shortcomings in Thai teachers: firstly, teachers are scarce and unevenly distributed; secondly, teachers' lack of teaching experience is explored and reflected upon; and thirdly, teachers lack teaching experience and are highly mobile. Gao (2020) points out that in many schools in Thailand, there is no multimedia equipment in the classroom, only blackboards and markers as teaching tools. Other teaching aids, such as vocabulary cards, pictures, objects, and recordings, need to be made and prepared by teachers themselves. The shortage of these teaching aids has caused great difficulties for Chinese language teachers, and teaching effectiveness has been dramatically reduced.

In response to the various problems encountered in teaching, how can Chinese teachers creatively understand and use teaching materials, actively develop curriculum resources, flexibly use teaching strategies, guide students' independent inquiry-based learning, and stimulate students' interest and desire to explore?

The rapid development of information technology in recent years may offer new ideas and ways to address this issue better. One entry point is the language learning platform Quizlet, founded in 2005 in the USA, a web-based and mobile platform that allows learners to learn through pull-out cards, tests, games, and other features. Users of Quizlet can be learners or teachers; it can be used both as a language learning assistant and as a learning tool for subjects other than languages. It can be used as a learning aid or a learning tool for subjects other than languages. Because of the openness and usefulness of the platform, as of December 2021, Quizlet's website claims to have a collection of over 500 million user-generated swatch cards and over 60 million active users.

With over 60 million active users of Quizlet, the platform has attracted the interest and attention of many researchers who have begun investigating the impact and changes this application may have on language learning. Anh Tuan Pham (2022) studied the role of Quizlet in teaching vocabulary through questionnaires and semi-

structured interviews with 148 students at a private university in Vietnam. The results showed that students sometimes used Quizlet for vocabulary learning, with a frequency of about 2 hours per week, and that Quizlet had become an excellent tool for vocabulary acquisition. In addition, students' satisfaction was high. As students were delighted with Quizlet, it became their first choice in their learning process as they spent a certain amount of time using its features regularly. The results of this study demonstrate the impact of Quizlet on vocabulary mastery.

Furthermore, teachers can use Quizlet as an aid to teach vocabulary, and students can use it to enrich their vocabulary. Similarly, Setiawan (2020) conducted a study on the relationship between motivation and achievement in vocabulary learning, which showed that the higher the motivation students gain, the greater their success in mastering vocabulary. Teachers need to discover appropriate vocabulary media to increase their motivation. Some apps (such as Quizlet) can be used to learn vocabulary via smartphones. The results of his study showed that using the Quizlet app was effective in increasing students' motivation to learn vocabulary. Students felt more enthusiastic and less likely to get bored and, therefore, showed high interest in learning vocabulary through the app, and they also completed the tasks provided in the app independently.

A study by Wang (2020) used 13 high school students in a US high school as the survey population. Comparatively, it analyzed various learning apps used in Chinese language classrooms, including Kahoot and Quizlet. The study aimed to find learning apps best suited to classroom tasks to support the teacher's instructional efforts and guide the student's learning process. The study results showed that the learning apps had a range of positive impacts on students, including stimulating interest in learning, motivating students to participate in the classroom, and even fostering teamwork skills. Building on this, the study by YanJu, Mohamed, & Mei (2017) emphasized the critical role of Quizlet in helping foreign language learners master Chinese vocabulary. The study showed that Quizlet improved students' Chinese vocabulary and enhanced their overall language learning experience. This sentiment is echoed in "Students' Perceptions of Quizlet as a Chinese Learning Tool: A Preliminary

Study" by Lam, Wang, and Zhao (2017), which assessed Quizlet's efficacy in helping students memorize and understand Chinese vocabulary. The study pointed out Quizlet's interactive and multifaceted learning methods as particularly advantageous for younger learners. Gao (2023) study also highlighted Quizlet's significant role as a contemporary tool in learning Chinese vocabulary, showcasing its varied features like digital flashcards and game modes. These functionalities not only improved vocabulary mastery among students but also made learning more interactive and enjoyable, boosting their enthusiasm for acquiring a new language.

The analysis of Quizlet's application in language learning globally shows it to be a leading tool. Its gamification of vocabulary learning is particularly effective and significantly improves learning outcomes. Although Quizlet has been widely adopted in Chinese classrooms across Europe and the United States, its use in Thailand is limited. This presents a research opportunity to explore its potential to improve Chinese vocabulary learning among Thai students in different cultural and educational contexts. This gap suggests a promising area for further investigation into how the application of Quizlet can be customized or expanded to meet the specific needs of learners in different environments, reinforcing its status as an essential tool in foreign language education.

1.2 Research Questions

1.2.1 Would the Application of Quizlet help improve grade 5 Thai students' Chinese vocabulary learning?

1.2.2 What was grade 5 Thai students' satisfaction level after using the Application of Quizlet in Chinese vocabulary learning?

1.3 Research Objectives

1.3.1 To compare the grade 5 Thai students' Chinese vocabulary learning before and after using the Application of Quizlet.

1.3.2 To investigate grade 5 Thai students' satisfaction towards the use of the Application of Quizlet in Chinese vocabulary learning.

1.4 Research Hypothesis

1.4.1 The grade 5 Thai students' Chinese vocabulary learning was higher after using the application of Quizlet.

1.4.2 The grade 5 Thai students' satisfaction was in a high level after using the application of Quizlet.

1.5 Scope of the Study

1.5.1 Location of the Study

This study was conducted in a private school in Samut Prakan Province, Thailand. Established in 2002, the school provided education from kindergarten to high school and had 547 students and 44 teachers. Since 2002, the school has offered Chinese language programs from kindergarten 3 to High School. The Primary School offered 1.7 hours of Chinese language classes weekly to provide students with a systematic Chinese language education. In addition, the school organized annual Chinese cultural activities to provide students with a deeper understanding of the Chinese language and culture.

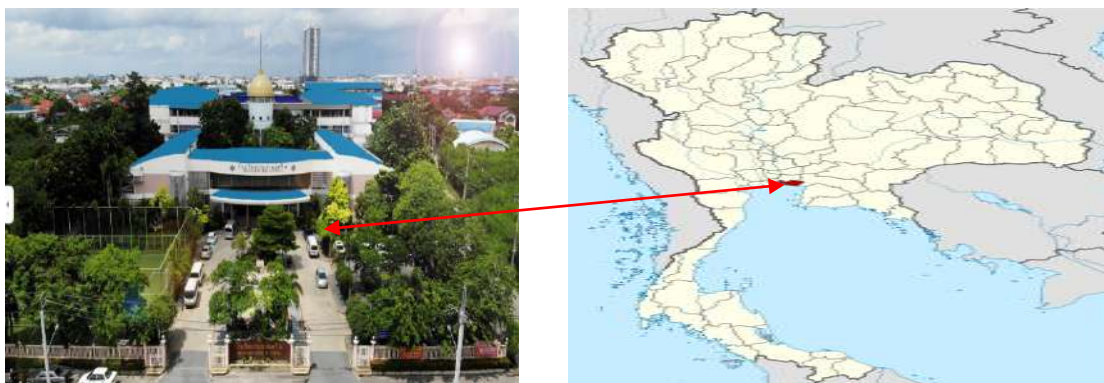


Figure 1.1 Location of the Research Setting

Source: Baidubaike, 2022

1.5.2 Population and Sample

Population: The study's target population consisted of 71 students from three Grade 5 classes. The students' ages ranged around 10 to 11 years old, and they were of mixed genders and had mixed learning abilities.

Sample: The researcher had chosen a cluster random sampling from the population as the sample group (26 students). The students were of mixed genders and had mixed learning abilities, with 13 boys and 13 girls.

1.5.3 Content of the Study

The researcher conducted two classes a week for one month, comprising eight sessions. The lessons began in the first week of February and concluded in the fourth week. The four lesson plans were designed to utilize Quizlet to teach Chinese vocabulary and words to the sample group of students. The learning activities were developed using the four topics in the Grade 5 textbook.

Table 1.1 Content of the Study

Lesson Plans	Topics	Quizlet Teaching Method	Timeline
Pre-Test			
Lesson Plan 1	Country	Enhance Chinese vocabulary learning using Quizlet's Match game	Week1
Lesson Plan 2	Place	Enhance Chinese vocabulary learning with Quizlet's Learn model.	Week2
Lesson Plan 3	Daily activities	Enhance Chinese vocabulary learning with Quizlet's Classic Live model	Week3
Lesson Plan 4	Tableware	Enhance Chinese vocabulary learning with Quizlet Test mode	Week4
Post-Test			

1.5.4 Time Frame

The study was conducted over the period of one month from the first week of February to the fourth week of February in the Academic Year 2024. The teaching experiment lasted for four weeks. The class sessions were conducted twice a week. Four lesson plans of 100 minutes each were designed. Table 1.2 below shows the timeline of the study.

Table 1.2 Timeline for the entire study

Activities	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Jun	July
Literature Review										
Research Proposal										
Data Collection										
Data Analysis										
Final Defense										

1.6 Conceptual Framework of the Study

This study consisted of two variables——independent and dependent variables. The independent variable was the application of Quizlet, and dependent variables were Chinese vocabulary learning and students' satisfaction.

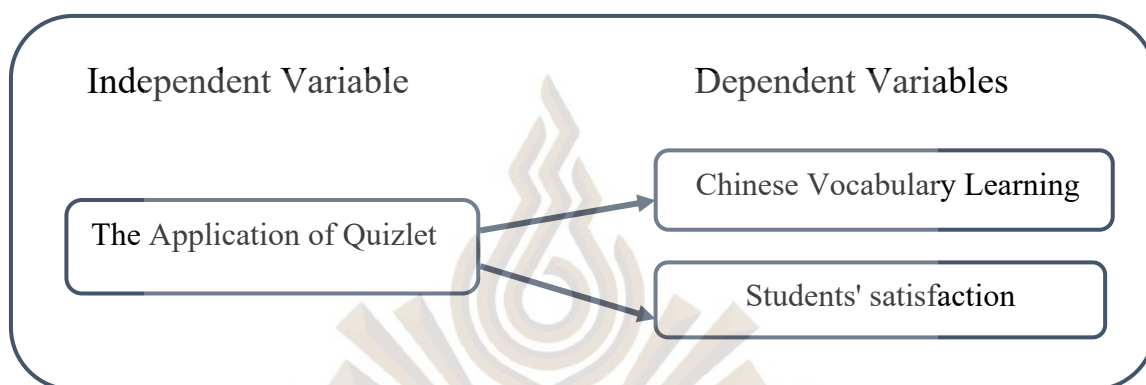


Figure 1.2 Conceptual Framework of the Study

1.7 Limitations of the Study

1.7.1 This study was limited to grade 5 students in a private school in Samut Prakan Province, Thailand. Therefore, it may have been unreliable to generalize the results to students at other levels or settings.

1.7.2 The data for the study was collected on Chinese vocabulary learning and the student's satisfaction. Therefore, the research could not be generalized to all other variables.

1.8 Operational Definitions

The application of Quizlet referred to the methodology that the researcher designed for teaching the sample group. The Quizlet Application is a free online platform that provides tools such as flashcards, math games, learn, classic live, and tests to make learning more interactive and effective. In this study, Quizlet was used

for classroom teaching and assessment. There were four steps for teaching: 1) Warm-up: Introducing a new lesson by starting a discussion around a topic related to the theme; 2) Instruction: Using Quizlet flashcards to demonstrate topic-related Chinese vocabulary, provide guidance for comprehension and application, and reinforce dialogue practice; 3) Learning activities: Combining Quizlet's multiple learning modes, which helped students effectively master and use Chinese vocabulary and increase their interest in learning and 4) Summary: Using Quizlet to set vocabulary revision tasks and assess student learning.

Chinese vocabulary learning referred to the improvement in scores for Chinese vocabulary on the topics of countries, places, daily activities, and tableware among the sample group after using Quizlet. This was measured by the pretest and posttest, including 5 listening questions, 15 reading comprehension questions, and 2 oral questions, with a total score of 50 points.

Students' satisfaction referred to the contentment of the students in the sample group by using Quizlet to learn Chinese vocabulary. In this study, students' satisfaction was measured by responses to a set of questionnaires divided into three main parts: interest and motivation, engagement, and the effectiveness of Quizlet.

1.9 Significance of the Study

1.9.1 The study showed the effectiveness of using the Quizlet application to improve Chinese vocabulary learning for Grade 5 Thai students.

1.9.2 The use of Quizlet would help increase students' satisfaction with Chinese vocabulary learning.

1.9.3 The study encouraged Chinese teachers to adopt the Quizlet application in teaching Chinese vocabulary, offering a richer and more interactive learning experience.

CHAPTER 2

LITERATURE REVIEW

This chapter introduces the relevant research literature review, discusses the background of Chinese language education in Thailand, the Chinese curriculum, Chinese vocabulary learning, the application of Quizlet, students' satisfaction and relevant learning theories, and an overview of related research and studies, which are stated in the following order:

- 2.1 The Background of Chinese Language Education in Thailand
- 2.2 Chinese Curriculum in Thailand
- 2.3 Chinese Vocabulary Learning
- 2.4 The Application of Quizlet
- 2.5 Students' Satisfaction
- 2.6 Related Learning Theories
- 2.7 Related Research and Study

2.1 The Background of Chinese Language Education in Thailand

The close economic, cultural, and historical ties between China and Thailand highlight the importance of Chinese language education in Thailand. However, Chinese language education in Thailand faces challenges in terms of quality of instruction, resources, methods, and student engagement. In response to these problems, the researcher will propose some reforms that will help to improve the overall quality of Chinese language education in Thailand.

2.1.1 The Importance of Chinese Language in Thailand

China and Thailand are geographically close and have historically maintained close commercial and trade exchanges. Especially in the 19th century, people from the coastal areas of China began to settle in Thailand. They founded schools on their own initiative to pass on traditional Chinese culture. These schools taught not only language and culture but also Chinese values, philosophy, and social customs (Geng & Liu, 2020). As the Chinese community continues to expand, they play an essential role in entrepreneurship, investment, innovation, and trade and increasingly impact the Thai economy. Therefore, it would be a great advantage for businesses and individuals if Thais could speak fluent Chinese.

Firstly, China has been Thailand's largest trading partner for nine consecutive years since 2013 (Zhong, 2022); Chinese manufacturing products, electronic equipment, machinery, and equipment are in high demand in the Thai market, while Thai agricultural products, food, and automobile parts and components are also popular in the Chinese market (Zhu, Thanandajirakul, & Jiao, 2022). As economic cooperation between China and Thailand continues to strengthen, Thais who master the Chinese language have a more significant competitive advantage in business negotiations and trade transactions, which creates more employment opportunities for them.

Secondly, mastering the Chinese language helps the development of Thailand's tourism industry. As an important source country for Thailand, China plays an important role in Thailand's tourism industry (Lu, 2020). Through Chinese language communication, Thailand is able to more accurately meet the needs of Chinese tourists and provide personalized and customized services, including catering, accommodation, and tour routes. Also, it brings rich opportunities for developing Thailand's tourism industry.

Finally, learning the Chinese language not only has a far-reaching positive impact on diplomatic relations, academic education, and cultural exchanges between China and Thailand but also develops Thai people's ability to function in a multicultural

environment, making them more capable of presenting themselves in international affairs and contributing to national development and international cooperation.

Therefore, mastering fluent Chinese ability will give Thailand a competitive advantage in business negotiations and trade cooperation, and learning Chinese will help improve Thailand's tourism services, meet the needs of Chinese tourists, and promote tourism growth. In addition, learning Chinese will help strengthen academic exchanges between China and Thailand and create more employment opportunities for Thais in the global market. Learning Chinese is a far-reaching strategic move for Thailand, which can significantly impact multiple fields and paint a brighter prospect for the future development of Thai individuals and the country.

2.1.2 Teaching Chinese as a Foreign language in Thailand

Teaching Chinese as a foreign language refers to the educational activity of teaching Chinese to non-native speakers in a non-Chinese speaking environment. It includes not only the teaching of the four basic language skills of listening, speaking, reading, and writing but also the teaching of Chinese culture, history, and social customs. Its purpose is to help learners fully understand and master the Chinese language and the related cultural background (Dongyi, 2023).

Teaching Chinese as a foreign language was initially formed in ancient China's exchanges with neighboring countries, mainly for scholars and officials of neighboring countries. In the 21st century, the interest in Chinese language learning has increased worldwide, especially in Thailand, which is inseparable from the economic and cultural relations between China and Thailand (Tongxin, Xiulan, & Huixia, 2019). Many schools and educational institutions in Thailand have offered Chinese language courses, and China and Thailand have strengthened cultural exchanges through platforms such as the Confucius Institute (Liu, 2023).

In Thailand, Teaching Chinese as a Foreign Language focuses on the development of practical language skills to meet the growing demand for Chinese

language in business and tourism due to the close economic ties between Thailand and China (Xiaoling, 2022). The Chinese classroom methodology skillfully combines traditional classroom instruction with modern interactive methods and extensively uses technology and multimedia resources to enrich and enhance the learning experience. In addition, these programs integrate native Chinese and Thai-speaking teachers to provide students with a comprehensive and in-depth language learning environment (Xueyang, 2022).

2.1.3 Current Situation of Teaching Chinese as a Foreign language in Thailand

Nowadays, Chinese language education in Thailand covers various aspects of education, such as Chinese private schools, Thai primary and secondary schools, international schools, colleges, universities, language schools, language centers, distance education, language tuition classes, and home education (Guo & Meng, 2018). According to the Thailand Chinese Language Education Market Deep Research and Analysis Report 2020-2024 published by Xinxin Industry Research Center, there are over 150 Chinese language schools in Thailand with more than 7,000 students enrolled, and the vast majority have both primary and secondary sections.

The development of Chinese language learning provides Thai students with more opportunities for learning and cultural exchange, but a series of problems also accompany it. Based on the work situation, the researcher analyzed as follows:

1) Quality of Instruction: The Chinese government annually sends several Chinese volunteers to teach in Thailand. However, many volunteers leave Thailand after one or two years of teaching (Li, 2021). At the same time, most of the volunteer teachers from China cannot speak Thai and have a limited understanding of the Thai country and culture, which leads to some difficulties in communicating with students (Ma, 2020) and a lack of experience in classroom management. It is worth noting that although native Thai teachers have a deep background in the Thai language and culture, which helps them to communicate more smoothly with their students, their Chinese language proficiency is relatively limited, resulting in a classroom

environment wherein Thai is mainly used as the primary language of communication. This situation may affect the formation of an excellent language-learning atmosphere (Li, 2018a).

2) Resources: There is no unified standard for selecting teaching materials in Chinese schools in Thailand. Although there are many Chinese teaching materials to choose from, it is still challenging to find a set of Chinese teaching materials that meet the characteristics of Thailand's educational environment and students (Tong, 2022). Li (2021) study reveals that Chinese as a Foreign Language textbooks often provide only Chinese and English translations but need more Thai versions, making it easier for students to accurately understand the content of the textbooks during the learning process. Moreover, textbooks need more practical applications, and expressions must fit Thai students' culture and way of thinking, which may cause learning barriers.

3) Teaching methods: Yan, Guo, and Chen (2020) found that the current situation of Chinese language teaching in Thailand generally adopts the traditional translation method, in which the classroom presents a teacher-centered model where students read aloud vocabulary and texts under the guidance of the teacher and translate them into Thai. However, some limitations to this teaching method may affect the teaching effectiveness and the student's learning experience. In such a classroom atmosphere, students tend to be passive recipients of knowledge and lack opportunities for actual practice. Furthermore, the traditional translation method makes students rely too much on the Thai translation for comprehension rather than thinking and expressing themselves directly in Chinese. This ultimately limits their confidence and ability to adapt to a Chinese-speaking environment.

4) Students: Some Thai students are fearful of learning Chinese, causing anxiety and depression. In more severe cases, this negative emotion may be transformed into problematic behavior in the classroom (Yu, 2020). Another problematic situation in class is students' lack of attention. When they are not interested in the lesson, some students refuse to listen to the teacher and instead chat or

play with their friends. Such situations where lacking discipline poses a considerable challenge to educators and often lead to poor student learning performance (Yu, 2020).

In order to solve the above problems in Chinese teaching, several strategies are proposed:

Firstly, Chinese language teachers should be provided with continuous professional training to keep them abreast of the latest developments in the field of education and familiarize them with advanced teaching methods, materials, and technologies. At the same time, special attention should be paid to the training of native teachers. Secondly, the selection of teaching materials should consider students' age, level, and learning needs. Ensure that the contents of the selected teaching materials are in line with the students' backgrounds so that they can understand and accept them more easily. Enriched teaching materials can increase the enjoyment of learning and enhance learning effectiveness.

In addition, students are encouraged to participate actively in classroom discussions, activities, and role-plays through the introduction of interactive pedagogy. Meanwhile, the researcher has a creative approach to improving teaching through Quizlet's online platform. By utilizing Quizlet, the researcher plans to create a more fun and active learning environment in the classroom. Capture students' interest and inspire participation by designing vocabulary puzzles or grammar challenges. At the same time, researchers also hope that through Quizlet's online platform, students can review vocabulary and grammar at home anytime and anywhere, enhancing their memory and understanding. The researchers believe this method can improve students' learning motivation, increase their enthusiasm for learning Chinese, and improve their learning effect.

2.2 Chinese Curriculum in Thailand

We will explore the historical evolution of the Thai education system and Chinese language education in Thailand, as well as the critical policies and laws developed by the Thai government for the Chinese language curriculum in the past 20 years. At present, in Thailand's basic education system, the Chinese language, as part of the teaching objectives, has specific curriculum standards at the primary and secondary levels, which has laid a solid foundation for Thai students to learn Chinese.

2.2.1 The Changes in Thailand's education system and related education policies

The history of primary and secondary education in Thailand has gone through four critical stages, from the earliest traditional education provided by temples (before 1868), which focused on transmitting religious and traditional values. In the period of new education (1868-1931) that introduced and embraced the Western model of education, where under the leadership of King Chulalongkorn (Rama V), Thailand modernized and reformed education by establishing schools, introducing Western curricula, fostering an international outlook, and promoting universal access to education. This period saw the establishment of the first modern school in Thailand and marked the transformation of Thai education.

Over time, education in Thailand entered the modern education period (1932-1996), during which the Thai government continued to expand the education system and provide broader access to education through the universal education policy. The content of education became more diversified, including subjects such as science, literature, and social sciences. Thailand's university system also grew to provide students with higher levels of education. From 1997 to the present, Thailand's education system has undergone further reforms to meet the challenges of the 21st century, with the government committed to improving the quality of education, improving curricula, upgrading the quality of teachers, introducing modernized

educational technology, and promoting inclusive education. Emerging trends such as digital education, online learning, and STEM education have also begun to play an essential role in Thai education (Nakpreecha, 2015).

These four periods of educational change mark the continuing evolution of Thailand's education system, with a comprehensive shift from traditional religious education to modern comprehensive education. This evolutionary process has been accompanied by the formulation and implementation of several critical educational policies and regulations, including the "Thai National Education Plan 2002-2016" and the "National Economic and Social Development Plan," which emphasize the importance of improving the quality of education, its accessibility, and the development of competitive human resources. In addition, implementing the "Strategic Plan for the Promotion of Chinese Language Teaching and Learning to Enhance National Competitiveness (2006-2010)" promotes Chinese language education to meet internationalization and economic needs. Meanwhile, the promulgation of the "2008 Core Curriculum for Basic Education" and the "2010 Thai National Education Regulation" provide Thai students with a more comprehensive, diversified, and modernized educational experience, ensuring that they are equipped with the skills and knowledge to meet the challenges of the twenty-first century. Together, these policies and regulations have contributed to the continuous progress of Thailand's education system to meet the needs of the country's development and globalization and have also had a significant impact on the development of Chinese language teaching in Thailand (Zhang, 2019).

The implementation of Thailand's Basic Education Curriculum Reform in 2001 has divided the Thai education system into three stages: preschool, primary education, and higher education. Preschool education is kindergarten education, where students are enrolled from three to four for two to three years, and is the beginning of education. Thailand's basic education is divided into four segments, with children entering school at the age of six, grades 1-3 as the first segment, grades 4-6 as the second segment, grades 1-3 as the third segment of secondary school, and grades 4-6 as the fourth segment of secondary school. The curriculum includes Thai language,

mathematics, science, social, religious-cultural studies, health and physical education, arts, vocational and technical studies, and foreign languages (He, 2010).

2.2.2 Impact of Thailand's Education System on Chinese Language Teaching and Chinese Language Curriculum in Thai Primary and Secondary Schools

Firstly, the goals and principles of the Chinese language curriculum in Thai primary and secondary schools are determined at the macro level: "The 2008 Core Curriculum for Basic Education" emphasizes a learner-centered approach to teaching and learning, aiming to develop children and adolescents' acquisition of knowledge, skills, attitudes, and virtues, which include five key competencies: communicative competence, thinking competence, problem-solving competence, survival competence, and competence in the application of technology. This curricular philosophy is important for teaching Chinese as a foreign language because it encourages educators to place the needs and interests of learners at the center of instruction and to help learners develop language skills and comprehensive literacy. By emphasizing communicative, thinking, problem-solving, survival, and technology-application competencies, this curricular framework provides a more holistic education for learners of Chinese as a foreign language to enable them to use the Chinese language in diverse contexts successfully and to promote intercultural communication and global cooperation (Feng, 2018).

Secondly, the norms were set for the development of the Chinese language curriculum for primary and secondary schools in Thailand: In 2001, the Ministry of Education issued the "National Basic Education Curriculum 2001," in which the word "Chinese language" appeared for the first time in the foreign language teaching section, that is to say, the Chinese language formally entered the basic education system of Thailand from the point of view of the National Education Curriculum (Zhu, 2015). The Chinese language course in the Thai education system belongs to a supplementary course. Schools can independently decide whether to offer Chinese language classes, at what stage to offer Chinese language classes, what forms of Chinese language classes to offer and how many hours of Chinese language classes to stipulate, etc., under the

premise of complying with the relevant provisions of the "2008 Core Curriculum for Basic Education". Pan (2013) surveyed the number of hours of Chinese language classes in schools that currently offer Chinese language classes and compared the data with the basic hours of foreign language classes stipulated in the "2008 Core Curriculum for Basic Education", suggesting that the number of hours of Chinese language classes in primary and secondary schools in Thailand should be set at 40 hours per school year for grades 1-3, and 80 hours per school year for grades 4-6 in elementary school. It is recommended that the number of hours for Chinese language courses in basic education in Thailand should be set at 40 hours per school year for primary and secondary school grades 1-3, 80 hours per school year for primary school grades 4-6, 80 hours per school year for junior high school grades 1-3, 80 hours per school year for senior high school Chinese language courses, and 240 hours per school year for Chinese language classes in liberal arts. The researcher's school is a private school in Thailand, and according to the Thai Ministry of Education's curriculum, the school has two Chinese language classes per week, each lasting 50 minutes, and Chinese language is compulsory from kindergarten³ to high school. Students are required to achieve 100 words in the third grade of primary school, 300 words in the sixth grade of primary school, 600 words in the third grade of junior high school, and 900 words in the third grade of senior high school.

While progress has been made in Chinese language education in Thailand, some problems still need to be solved. One of them is that the education policy emphasizes decentralization and primary and secondary schools have greater autonomy in organizing and arranging Chinese language teaching. However, there has long been a lack of standardized and authoritative Chinese language syllabi, which has led to significant differences in teaching objectives and methods among schools, making it difficult to achieve a high level of uniformity in teaching results. In addition, Li (2018) pointed out that there are differences in the development of teaching materials, a lack of coherence in learning content, a lack of scientific basis for curriculum arrangement, and a lack of organic articulation between different stages. The key to solving these problems is to develop standardized syllabuses and provide uniform guidance to ensure that Chinese language education is consistent and of high quality across schools (Wang, 2008). This

will help improve students' Chinese language proficiency and, at the same time, help better meet the country's needs for Chinese language education to meet the challenges of the era of globalization.

2.3 Chinese Vocabulary Learning

Chinese vocabulary is the core of teaching Chinese in Thailand, and it is crucial to students' ability to form sentences and understand the language. In the face of the learning challenges posed by the cultural differences between China and Thailand and the complexity of Chinese characters, many researchers have advocated incorporating multimedia technologies in teaching. We will explore how to improve the effectiveness of Chinese vocabulary learning, make it more vivid and intuitive, and help students better master and use Chinese vocabulary.

2.3.1 The Importance of Chinese Vocabulary Learning in Teaching

Chinese is one of the most difficult languages in the world to learn. As with English language teaching, teaching Chinese as a foreign language requires much attention to vocabulary teaching. Lu (2007) mentioned that "vocabulary teaching is extremely important both for the language teaching to native speakers and for teaching Chinese to foreigners."

Firstly, vocabulary is the foundation of language learning and the most basic unit of language expression. Only when students master a sufficiently rich vocabulary can they understand and use Chinese more easily (Zhu, 2018). In addition, the degree of vocabulary mastery directly affects students' ability to construct sentences. Students with a rich vocabulary can build more complex, accurate, and colorful sentences, enabling them to communicate more freely and interact with others in daily life (He, 2019).

Secondly, vocabulary is the basis for improving listening and speaking skills, and a rich vocabulary significantly improves students' listening and speaking skills.

Meanwhile, Yuan (2021) points out that good vocabulary mastery also positively impacts reading and writing proficiency, enabling students to comprehend texts better and express ideas. Zhao (2021) points out that international Chinese language teaching must be centered on vocabulary teaching and adhere to "vocabulary first."

Thirdly, by learning vocabulary, students can improve their language skills and gain a deeper understanding of Chinese culture, including customs, traditions, and literary works. This cultural understanding provides them with a broader view of knowledge and promotes cross-cultural communication and understanding (Zhang, 2022).

Finally, vocabulary teaching is considered the most basic Chinese language teaching activity. Solid vocabulary teaching is not only to lay a firm foundation of the language but also to cultivate students' learning motivation and inspire them to learn Chinese. This learning motivation will become a powerful source of motivation for students to make continuous progress and improve their language proficiency (Liu, 2023).

In summary, vocabulary teaching plays a crucial role in international Chinese language teaching. This approach does not neglect phonetics and grammar but instead puts vocabulary teaching at the center of teaching while promoting students' learning of phonetics, grammar, and Chinese characters.

2.3.2 The Difficulties in Chinese Vocabulary Learning

Teaching Chinese vocabulary is crucial, but due to some features of the Chinese language, such as the complexity of writing Chinese characters, polyphony, tones, and different grammatical structures, all these factors can make learning more difficult. Aiming at the various problems in Chinese vocabulary learning, many researchers have actively explored different perspectives and methods, aiming to improve the effectiveness of Chinese vocabulary learning.

Zhang (2021) study found that due to the differences between Chinese and Thai cultures, students are prone to form "vocabulary bias" in learning cultural vocabulary, which has become a significant obstacle to the growth of students' Chinese language proficiency. After teaching the phonetics and semantics of words, teachers should add cultural knowledge to the teaching content to broaden students' understanding.

According to the research of Jiang and Wang (2015), there are homophones, similar characters, polysemous characters, and polyphonic characters in modern Chinese, which may bring some difficulties to Thai students in learning Chinese. Homophones such as "真" and "甄" have the same pronunciation, "zhen," while similar characters such as "免" and "兔." In addition, polysemous characters such as "好" can have two different pronunciations, "hǎo" and "hào," which may increase students' learning difficulty.

A study by Liu (2022) found that most Thai students perceived the glyphs of Chinese characters to be completely different from those of the Thai language and, therefore, difficult to memorize. This perceived difference in the glyphs of Chinese characters may constrain students' progress in learning Chinese and become a shortcoming in Chinese language teaching.

Wang (2019) suggests that vocabulary teaching in teaching Chinese as a foreign language is never just for students to memorize raw words and that vocabulary teaching is not a translation of language but includes four major aspects of vocabulary: phonology, glyphs, semantics, and usage, so that students' feedback and classroom practice should be emphasized in the classroom.

Wen (2022) view emphasizes the need for more innovative and interactive approaches to teaching Chinese as a foreign language, especially vocabulary teaching, rather than the traditional mechanical and classroom-full approach. She proposed using a game approach to vocabulary teaching to improve the classroom atmosphere, reduce learners' anxiety, and make learning Chinese more enjoyable and effective.

Lin (2018) view points out that an increase in language expression usually accompanies an increase in vocabulary. However, for Thai students, vocabulary learning is still in its infancy. It may lack sufficient repeated practice and repetition, resulting in vocabulary memory that needs to be consolidated and quickly forgotten. This phenomenon is closely related to Chinese language teaching methods and may require improved teaching strategies to enhance students' vocabulary acquisition.

In the context of the 21st century, to more effectively help students master Chinese vocabulary learning and improve their language skills, we need to fully incorporate the Internet and multimedia technology to provide students with personalized and flexible learning methods to meet the needs of modern education.

2.3.3 The Use of Multimedia Technology in Chinese Vocabulary Learning

Multimedia technology is based on computer and network technology, which can synthesize audio, video, graphics, and other multimedia information and integrate graphics, sound, and images into one. The power of multimedia technology is that it can put Chinese vocabulary learning in real situations and provide students with intuitive and vivid learning experiences by presenting pictures and movies. Ou (2012) pointed out that the use of multimedia courseware offers excellent opportunities for teaching Chinese vocabulary as a foreign language, which integrates a variety of media elements such as graphics, text, sound, and image and can stimulate the students' visual, auditory and sensory senses, thus effectively enhancing students' memory and understanding of Chinese vocabulary. Zhao (2017) also confirms that the flexible use of multimedia technology in teaching Chinese as a foreign language is conducive to creating authentic teaching situations, increasing students' interest in learning, enriching students' feelings and experiences, and thus enhancing the teaching effect.

Multimedia technology has great potential to improve Chinese vocabulary learning significantly. The following are some ways in which multimedia technology can be used in Chinese vocabulary Learning:

1) Visual learning is an instructional method that utilizes visual elements such as images, pictures, and videos to present vocabulary in a way that helps students associate vocabulary with vivid visual impressions, thereby significantly improving their vocabulary retention. Teachers can utilize software such as PowerPoint or Keynote to create lessons that show the explanations of Chinese vocabulary words, sentences, related pictures, and pronunciation demonstrations together on the slides to deepen students' understanding and memory of the vocabulary words (Zhang, 2021).

2) Multi-sensory experience means that multimedia technology allows students to interact and engage with Chinese vocabulary through multiple senses, such as visual and auditory, thus enhancing their immersion in Chinese vocabulary learning (Chang, 2023). In Chinese lessons, we will incorporate YouTube and other accompanying videos to provide students with an intuitive, multi-sensory learning experience to deepen their understanding of the text.

3) Pronunciation and speech training is a crucial application of multimedia technology that provides precise pronunciation demonstrations to assist students in pronouncing words correctly and adjusting voice intonation. For example, "Pinyin Master," "Duolingo," "Hello Talk," "Yabla," etc. can provide students with diversified learning experiences, help them to practice their Chinese pronunciation, and improve their speaking skills and listening ability (Hou, 2021).

4) Online Vocabulary Learning Tools: Using online platforms and apps that allow students to learn on their own, with interactive practice and feedback, Quizlet represents the quintessential platform in this area, allowing students to access learning resources at any time and from anywhere, according to their learning pace and needs, to improve vocabulary mastery more effectively.

Therefore, teachers can comprehensively use the above multimedia techniques in Chinese vocabulary teaching. The pronunciation, meaning, and usage of vocabulary words are shown as slides with pictures, audio, or video. With the help of video websites

such as YouTube or movie clips, students can better understand the practical use of vocabulary in different contexts. At the same time, teachers can design vocabulary games, quizzes, and activities in the classroom with the help of online platforms such as Quizlet and Quizizz to increase interactivity and stimulate students' interest and motivation in learning vocabulary. In addition, students can also be encouraged to use applications such as Quizlet in their personal study to consolidate the vocabulary they have learned anytime, anywhere. Cognitive psychology also tells us that the more senses learners use when learning a second language, the better the learning results (Zhao, 2022).

As a result, the researcher plans to introduce the Quizlet online platform in Chinese classrooms, aiming to stimulate active learning of Chinese vocabulary by providing an interactive and personalized learning experience. This integrated approach to teaching and learning is expected to promote successful second language learning.

2.4 The Application of Quizlet

As a popular learning tool, we will analyze the importance and advantages of Quizlet, discuss its operational procedures, and how it can be integrated into Chinese vocabulary learning. In addition, we will examine several studies on Quizlet to explore the possibility and potential value of its application in Chinese vocabulary learning.

2.4.1 The Definition of Quizlet

Quizlet is an online learning platform that provides various tools and resources to help students study and learn more effectively. As a 15-year-old high school student, Andrew Sutherland initially created Quizlet (Figure 2-1) to help him memorize French words. Then, after sharing and recommending it among friends, Quizlet grew and was officially launched in 2007 based in California (Zhao, 2020). Today, Quizlet is one of the most widely used educational apps globally, with over 50 million active users from 130 countries who have created over 300 million learning sets (Meng, 2021). Quizlet's core products include digitized cards, matching games, practice e-assessments, and real-time quizzes.

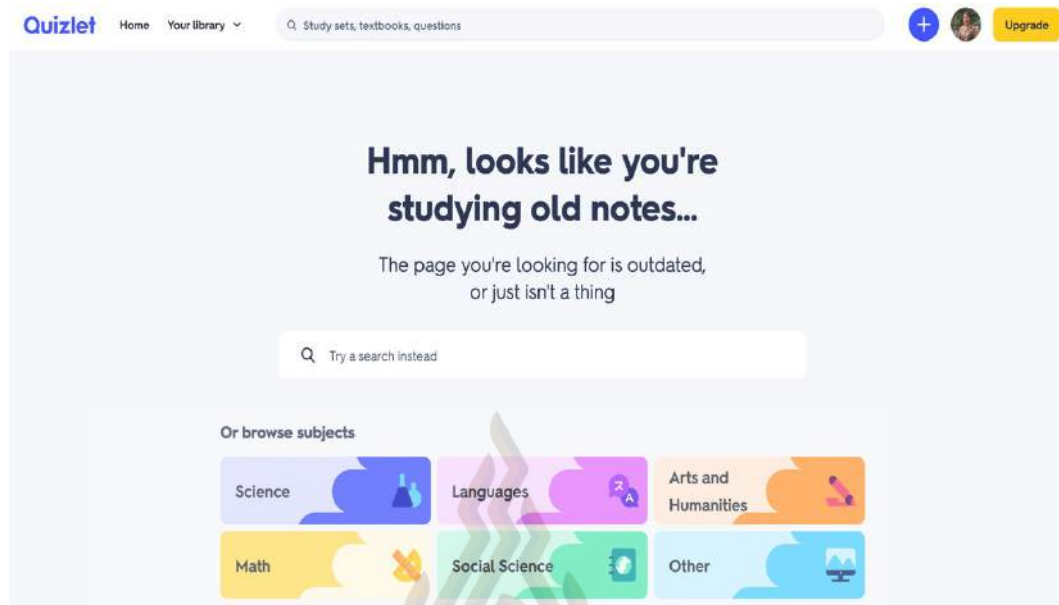


Figure 2.1 Quizlet Homepage

Source: Quizlet, 2023

2.4.2 The Importance and Advantages of Quizlet

The importance of Quizlet is that it provides a flexible, convenient and personalized learning platform for students and teachers. Students can choose from various learning modes at any time and place according to their needs, which not only improves memory and subject mastery but also promotes independent learning. At the same time, teachers can use Quizlet to create exciting learning materials to help students better understand and master knowledge (White & Li, 2016). By monitoring students' progress and problems through background data, teachers can provide more targeted support and personalized guidance to students, which improves the effectiveness of teaching and students' academic performance. This flexibility and personalization of Quizlet make it play an essential role in education. (Shi, 2019).

In addition, Quizlet is important because it drives innovation and development in modern education. It is not only a learning tool but also a model of teaching methodology. Through its unique learning model and personalized educational experience, Quizlet encourages active participation and self-directed learning and develops students' problem-

solving and critical-thinking skills. At the same time, it provides teachers with creative teaching resources that enable them to respond more flexibly to students' needs and promote continuous innovation in teaching methods. Dizon's (2016) perspective further emphasizes the critical role of Quizlet in this process, which has brought about significant and positive changes in the education system.

Over time, Quizlet has grown to become an integral part of the education space, demonstrating a clear competitive advantage with its unique functionality and social features, such as:

1) Variety of learning tools: Quizlet offers a wide variety of learning tools, including card-making, quizzes, games, and flashcards. This variety allows students to choose between different learning modes, increasing the fun and engagement of learning. Whether reviewing the basics or exploring in-depth concepts, Quizlet can meet the needs of students (Li, 2021).

2) Personalized Learning Experience: Quizlet allows students to create learning plans based on their own learning needs and progress. Students can create custom learning sets and choose the learning mode that suits them to personalize their learning. This personalized experience improves learning efficiency and allows students to focus on what they need most (Yuan, 2023).

3) Learn anytime, anywhere: Quizlet's online platform enables students to access learning resources anytime, anywhere, whether using a computer, tablet, or cell phone. This convenience means students can study at school, at home, or on the go, regardless of time or location. This flexibility to learn anytime, anywhere makes it easier for students to remain consistent in their learning (Liu, 2022).

4) Real-time progress tracking: Quizlet allows students and teachers to track progress and understand student performance. This real-time tracking helps teachers to identify students' problems and adjust their teaching strategies. At the same time, students can also understand their learning progress and adjust their learning

plan in time to improve their learning results. This instant feedback helps students master their knowledge better (Christian1 & Fortunata, 2023).

As a result, Quizlet has become a prevalent software due to its diversity of learning tools, personalized learning experience, ease of learning anytime, anywhere, and real-time progress tracking. It not only provides an excellent learning experience but also meets a variety of different learning needs, injecting new vitality and possibilities into modern education.

2.4.3 The Operating Process of Quizlet

Quizlet provides users with a convenient, efficient, and diverse learning experience that makes it easy for them to gain the knowledge they need, whether they are students, teachers, or self-learners. The platform is so simple that users can get started without complex training. The Quizlet process begins with the user creating an account, who can register for a new account via Quizlet's official website (www.quizlet.com) or the application. The user must provide a valid e-mail address, username, and password during registration. Once the account has been created and the user has successfully logged in, the user can start using the various features of Quizlet.

Quizlet's operational process is divided into three key steps: creating a learning set, learning the learning set, and tracking feedback.

Step 1: Create Quizlet's Learning Set. Flashcards are the most essential feature of Quizlet. This feature is similar to a paper flashcard, with the target word on one side and the explanation on the other side. Several flashcards can form a "learning set" (see Figure 2.2), and students can search for a learning set according to their needs (Agustina, 2018). If students need to study any lessons, they can create their own learning sets, and it is easy to do so. As the creator of a learning set, you can choose whether to share the learning set you created for free with other registered learners. The content of the learning set can be imported directly from Word and Excel, or you can create your flashcards directly on Quizlet. Quizlet provides users with a compelling

database containing vocabulary and explanations in many languages, like a built-in electronic dictionary for many different languages. So, Quizlet can automatically match the definition of the typed words (Liu, 2022).

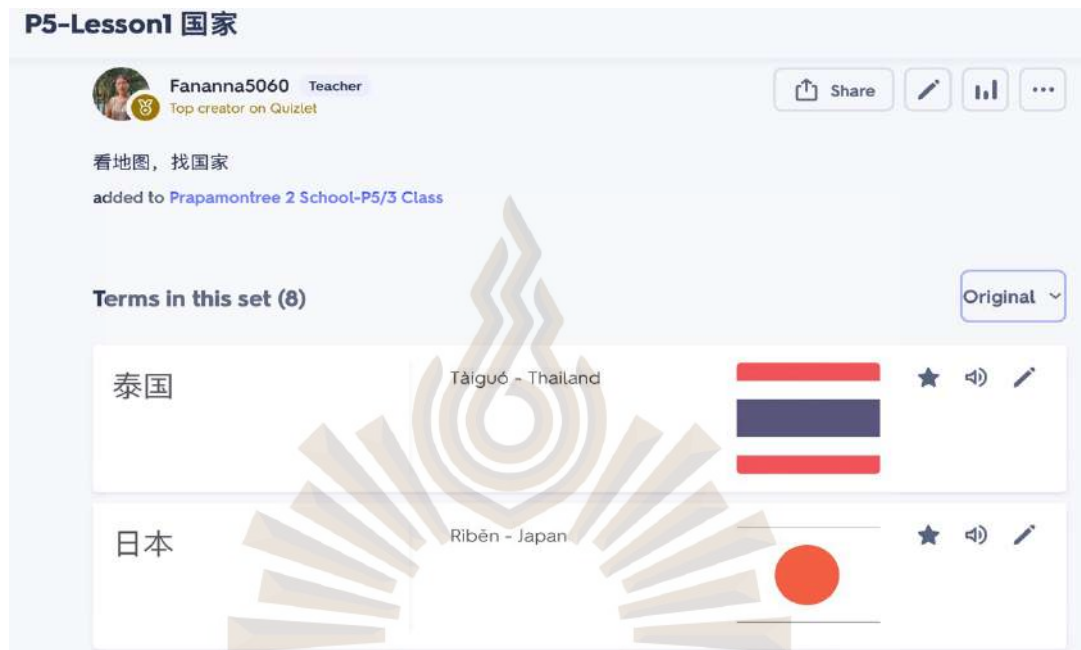


Figure 2.2 Quizlet Learning Set Completion Interface

Source: Quizlet, 2023

Step 2: Learning the Learning Set. After creating a learning set, Quizlet helps learners master the content through different features, including learning and games (Sanosi, 2018). Apart from the real-time functions that need to be initiated by the teacher, the rest of the functions, such as cards, learning, testing, and matching, can be done independently by learners on their own devices. This enables learners to use Quizlet independently to enhance their learning experience and improve their understanding and retention of the content in the learning episode (Li, 2020). Quizlet has two sections: In-class activity and Self-study activity. In-class activities include Classic Live and Checkpoint; self-study activities include Flashcards, Learn, Test, and Match (Quizlet, 2023).

Table 2.1 The description of learning modes in Quizlet Application

Learning Mode	Description	Website	Mobile App
Flash Cards	Digital flashcards allow the user to flip the card by tapping or touching the screen to display a definition or explanation of a word or concept.	Available	Available
Learn	Words and their meanings can be learned through multiple-choice and writing questions. Questions are sorted from easy to difficult.	Available	Available
Test	The questions are randomly generated from the contents of word cards, incorporating various formats like writing, single choice, multiple choice, judgment, and true/false questions.	Available	Available
Match	This game requires learners to match terms with their definitions (or corresponding pictures) as quickly as possible. At the end of the game, the app displays their score and ranking among other learners.	Available	Available
Classic Live	This unique feature of Quizlet allows teachers to create interactive learning games in real time that students can participate in via their phones, tablets, and other devices. This feature makes the classroom more lively and exciting, and students can learn in competition to improve their knowledge and retention.	Available	Non-Availabe

Table 2.1 The description of learning modes in Quizlet Application (Cont.)

Learning mode	Description	Website	Mobile App
Checkpoint	Unlike traditional competitive games, Checkpoint encourages students to learn together. Teachers can select questions and learning materials for students to quiz and learn together. At the same time, teachers can get feedback from the back-end data to help them understand their students' strengths and weaknesses so that they can better adjust their future course content and teaching methods.	Available	Non-Available

Source: Researcher

Step 3: Tracking and feedback. After students complete the learning set, teachers can check students' progress on each task through the system's data statistics to achieve personalized learning tracking and feedback (Ji, 2022).

2.4.4 Using Quizlet in Teaching

Combined with the advantages and features of Quizlet, teachers in different subjects can make full use of it in teaching. When teachers decide to use Quizlet, they prioritize clarifying their teaching goals and desired learning outcomes. Whether it is to help students memorize basic concepts, improve vocabulary, or promote an in-depth understanding of knowledge, Quizlet has flexible and diverse functions.

Firstly, the teacher creates a learning set based on the content and objectives before class and then uses Quizlet in several parts of the teaching process. Teachers use Quizlet flashcards to teach and review vocabulary in the classroom, helping students deepen their understanding and memorization. This interactive, lively, and interesting learning experience enhances student engagement and motivates students

to participate more actively in their learning, strengthening their learning outcomes (Qadriani, 2022).

Teachers can also utilize Quizlet's Match, Classic Live, and Checkpoint functions to design diverse classroom games to increase student participation and interaction. Through these exciting game modes, students can learn in competition and enjoy the fun of the teaching and learning process to be more actively engaged in learning activities (Anjaniputra & Salsabila, 2018).

Secondly, Quizlet can be used within the classroom and as an ideal tool for after-school assignments, encouraging students to embark on independent learning at home. This arrangement enables students to consolidate what they have learned outside the classroom, increasing their self-awareness and independence in learning.

Thirdly, Quizlet supports a wide variety of online tests and exams. Teachers can create customized exams based on course content to fully assess students' knowledge. Through these modes, Quizlet provides teachers with a powerful teaching tool that meets the needs of different teaching scenarios and helps students better prepare for exams.

Quizlet widely uses the models mentioned above in teaching and learning. Researchers have conducted in-depth studies on these models and achieved excellent results in actual teaching. Their research provides solid support for a deeper understanding of Quizlet's application in education.

Lander (2015) introduced Quizlet in English classes at private universities in Japan to help beginners memorize words. The results of the study showed that this interactive learning method had significant results in improving students' reading comprehension. Students memorized words and improved their verbal communication skills significantly through interactive learning with Quizlet.

Dreyer (2014) used Quizlet in high school language arts classes, using Quizlet to test students every week and asking students to use Quizlet in their spare time. The data show a strong correlation between the use of Quizlet and students' short-term memory.

Ismailova, Gleason, Provotorova, and Matukhin (2017) and others introduced the Quizlet platform into the Russian classroom to verify whether this model can help improve learning efficiency.

A study of 165 first-year business school students by Platzer (2020) found that vocabulary study using Quizlet had a slightly higher impact on test scores than the student's previous level of English.

Dizon's (2016) argument emphasizes the importance of Quizlet as a handy pedagogical tool for teachers and students. The interactivity and versatility of Quizlet provide students with a more engaging and efficient way of learning, which in turn helps to promote long-term vocabulary retention. Students generally agreed that the Quizlet application provided an enjoyable way to learn vocabulary (Lander, 2016).

Yu (2021) introduced Quizlet as a teaching aid for elementary Chinese language teaching in a university. The study shows that Quizlet affects oral, phonological, and vocabulary learning. Meanwhile, students' interest in learning increased significantly through Quizlet-assisted teaching, and the frequency of learning Chinese after class increased.

During the COVID-19 epidemic, Yan (2023) used an online course model to teach Chinese to students at the Faculty of Philosophy at the University of Novi Sad. In order to increase the interactivity of the classroom and stimulate students' interest in learning, he emphasized Quizlet as an excellent teaching tool, which has the convenient feature of creating quizzes, vocabulary cards, and other Chinese learning games, making the teaching process simpler and more accessible.

Therefore, Quizlet's flexibility and diversity change the face of traditional education and open up a new world of learning for students and teachers. Teachers have used Quizlet in various subject areas, from language courses to science classes, and have achieved remarkable teaching results. In today's rapidly developing digital era, Quizlet has become an indispensable part of modern education.

2.4.5 The use of Quizlet in this research

Since there is relatively more research on the application of Quizlet in English learning and relatively less research in Chinese teaching, the researcher plans to introduce Quizlet into the Chinese teaching classroom. This research direction will fill Quizlet's research gap in Chinese language teaching and provide new teaching methods and perspectives for Chinese language learning.

The researcher plans to introduce Quizlet to Chinese classes and use an experimental method to compare students' understanding of and application of Chinese vocabulary before and after using Quizlet. In addition, the researcher will use the students' satisfaction questionnaire to find out students' contentment with Quizlet and its effectiveness. This study aims to gain a comprehensive understanding of the impact of Quizlet on Chinese vocabulary learning to help students learn Chinese vocabulary better.

2.5 Students' Satisfaction

Students' satisfaction plays a very important role in teaching and learning, not only as an indicator of the effectiveness of teaching methods and learning materials but also as a critical factor reflecting students' learning experience and overall educational quality. In the following, we will detail the definition of students' satisfaction and explain how this indicator was used to evaluate the effectiveness of Quizlet in teaching Chinese vocabulary in this study.

2.5.1 Definitions of Students' satisfaction

The concept of "satisfaction" was initially derived from "customer satisfaction" and was first introduced by Cardozo (1965) (Shi, 2020). It measures the difference between a customer's expectations and experience of a product or service, creating a quantitative psychological experience. Customer satisfaction surveys are usually measured by collecting feedback, wishes, and expectations from customers so that companies can understand the quality of their products or services in order to provide a better customer experience (Han, Pankitwanitjalearn, & Waranonwanit, 2020).

In the field of higher education, the concept of student satisfaction is based on students as "consumers" of school education services. The concept of students' satisfaction is formed by comparing their experiences at school with their expectations and forming psychological feelings (Song & Yang, 2018). Students' satisfaction is evaluated by evaluating students' satisfaction with the educational services and learning experiences provided by educational institutions (such as primary and secondary schools, universities, training institutions, etc.). It is not only an evaluation of the quality of education but also involves perceptions of teaching methods, learning resources, and school management (Liu, 2016).

Research on students' satisfaction is relatively mature in foreign countries, especially in developed countries such as the United Kingdom and the United States. Schools and educational institutions in these countries usually conduct students' satisfaction surveys regularly. These surveys help understand students' needs, opinions, and expectations and provide schools with valuable feedback (Zheng & Xiong, 2016). Through students' satisfaction surveys, schools can improve their teaching quality and service levels in a targeted manner. This practice not only motivates schools to improve the quality of teaching but also ensures that students' interests are taken care of to the greatest extent possible and that a mechanism for continuous improvement is established (Liu, 2016).

2.5.2 Using students' satisfaction in this research

The core objective of this study is to comprehensively analyze the effectiveness of the practical application of Quizlet software in Chinese classrooms through an in-depth student' satisfaction questionnaire using a five-point Likert scale (Hu & Aijie, 2020). This study will examine three critical aspects of the questionnaire to gain insight into students' experiences and observed changes.

Firstly, the students' satisfaction questionnaire will focus on assessing students' interest and motivation in learning Chinese vocabulary using Quizlet, aiming to gain a deeper understanding of how Quizlet can increase students' interest in learning Chinese vocabulary, improve their motivation, enhance self-confidence, stimulate learning enthusiasm, and make the learning process more meaningful.

Secondly, the students' satisfaction questionnaire is designed to assess how Quizlet enhances student engagement in learning Chinese vocabulary. It will explore how Quizlet's interactive flashcards and games make learning more engaging and interesting, deepen student involvement, and enrich the learning experience. Additionally, it will evaluate the effectiveness of Quizlet's diverse learning tools in increasing students' willingness to participate in various learning activities.

Finally, this part of the students' satisfaction questionnaire was designed to assess the effectiveness of Quizlet in improving Chinese vocabulary learning. The students' satisfaction questionnaire explores how Quizlet can be used to help students practice pronunciation, understand word meanings, and improve their memory and usage skills. It will also assess the impact of the learning tools provided by Quizlet on improving the efficiency of Chinese vocabulary learning. These questions aim to understand how Quizlet can help students acquire Chinese vocabulary more effectively in various ways.

This study aims to gain insights into the impact of Quizlet on students' learning experience by comprehensively analyzing students' self-reports and feedback on learning Chinese vocabulary using Quizlet. Through the students' satisfaction

questionnaire, we will focus on evaluating the role of Quizlet in increasing students' interest and motivation in learning Chinese vocabulary, increasing learning engagement, and improving the efficiency of Chinese vocabulary learning. Through this comprehensive and in-depth study, we expect to provide strong empirical support for applying Quizlet in Chinese vocabulary learning and provide valuable insights for future language education practices.

2.6 Related Learning Theories

Based on the significant effects of Quizlet on vocabulary learning are supported by a variety of pedagogical theories. We will focus on the critical areas of cognitive psychology theory, gamification learning theory, internal motivation theory, and forgetting curve theory to analyze how these theories synergistically work together to improve students' efficiency and engagement in Chinese vocabulary learning.

2.6.1 Cognitive Psychology Theory

In the mid-20th century, psychologists began to recognize that human mental activity could not be fully understood through the study of observable behavior alone and turned to the study of the internal processes of human thinking and perception, leading to the formation of cognitive psychology.

Cognitive psychology studies the internal processes of human thinking, perception, and psychology, focusing on how individuals acquire, process, and store information and how these information-processing processes affect behavior. The field covers many essential topics, such as perception, learning, memory, language, problem-solving, and decision-making (Li, 2015). In the 1950s and 1960s, several critical studies laid the foundations of cognitive psychology, including Chomsky's theory of language acquisition and Miller et al.'s memory and problem-solving research.

Bi (2023) study emphasizes the critical role of cognitive psychology in linguistics. Through the theories and methods of cognitive psychology, researchers can delve into the cognitive mechanisms of human language processing and reveal the inherent process of language acquisition, production, and comprehension. Educators can design teaching methods that stimulate students' interest in learning and make the process of language learning more interactive and meaningful. The views of Ulric Neisser, a famous American cognitive psychologist, also emphasize the importance of introducing active, engaging, and motivating methods for students in teaching. Traditional rote teaching methods may not be able to stimulate students' interest in learning and intrinsic motivation (Agustina, 2018).

In this study, we chose Quizlet, based on the relevant principles of cognitive psychology, as a tool for learning Chinese vocabulary. Quizlet fully utilizes the principles of cognitive psychology, including repetition exposure, individual differences, motivation to learn, and spaced learning, to help students learn Chinese vocabulary better (Niu, 2019). Its flashcard mode and adaptive learning algorithm provide a personalized and systematic learning experience, while the interactive design enhances learning motivation. Meanwhile, Quizlet follows the principle of spaced learning to ensure long-term memory of learning outcomes. Therefore, Quizlet, an online learning tool that conforms to children's cognitive psychology and linguistics principles, provides students with a scientific and efficient Chinese vocabulary learning environment and a high-quality learning experience.

2.6.2 Gamification Learning Theory

Gamification learning theory is an educational theory that applies the elements and design principles of games to the education and learning process in order to increase student engagement, motivation, and learning outcomes (Yu, 2018). The theory suggests that designing educational content and learning activities in forms characterized by games, such as competition, rewards, challenges, and cooperation, can stimulate students' interest, increase the enjoyment of learning, and motivate them to participate more actively in learning. This approach is not only in line with the

psychological characteristics of students' age and makes learning more accessible and more enjoyable but also motivates students to participate more actively in the curriculum and strengthens the exercise of skills and knowledge (Yuan, 2022).

Bowman (1982), a pioneer in educational game research, proposed the integration of video games into instructional design to validate that educational games help students learn and are an efficient way of classroom management (Wu & Yao, 2015). In his book *What Games Can Tell Us About Learning and Literacy*, educator James Paul Gee explores the relationship between games and learning in detail and proposes several ideas and concepts about gamified learning (Gee, 2003). He argues that games have the unique ability to guide learning by encouraging players to try, fail, learn, and ultimately master the rules and skills of the game. These studies provide theoretical support for the application of gamified learning in education and provide essential insights for innovation in the field of education.

In this research, Quizlet leverages the gamification theory to provide students with a more interactive and fun learning experience. Through various interactive designs such as matching, spelling, and multiple-choice games, Quizlet transforms the learning process into a gamified challenge that stimulates students' interest and motivation. These game modes make learning more fun and provide real-time feedback to help students better understand and master the content. With the popularity of electronic devices, gamified learning has become a new trend in education.

2.6.3 Internal Motivation Theory

Internal Motivation Theory (IMT) was mainly proposed by psychologists Edward L. Deci and Richard M. Ryan, who proposed that Self-Determination Theory (SDT) aims to explore the intrinsic motivation and autonomy of individual behavior, emphasizing the importance of an individual's intrinsic motivation for self-behavior and autonomous choice (Xiao & Chen, 2020). According to the theory, people's motivation for activities can be categorized into three types: intrinsic motivation,

extrinsic motivation, and no motivation. Intrinsic motivation is an individual's motivation to engage in an activity out of intrinsic factors such as interest, curiosity, and satisfaction rather than extrinsic rewards and punishments. Intrinsic motivation is a more enduring and influential type of motivation that leads individuals to engage more deeply in an activity and persist over a more extended period (Chen & Wu, 2008).

The theory of intrinsic motivation in games proposed by Malone (1981) provides an important reference for game design and teaching. The theory suggests that in terms of individual motivation, elements such as challenge, curiosity, control, and fantasy stimulate players' intrinsic motivation and make them more engaged in the game. Moreover, in terms of collective motivation, elements such as cooperation, competition, and self-esteem affect players' interactions and social behaviors in games (Wang, 2012). In teaching, these intrinsic motivation factors can be utilized to design challenging and exploratory learning tasks to stimulate students' curiosity and desire for knowledge. At the same time, students' learning motivation is stimulated by introducing cooperative and competitive elements.

In this study, Quizlet used the theory of intrinsic motivation gamification to design various interactive games, such as matching, spelling, and multiple-choice games. These games were not only fun but also conferred a degree of challenge to the learning tasks. Students pursued victory and rewards in the competition and cooperation of the games, thus stimulating their intrinsic motivation to learn. Through these gamification designs, Quizlet has successfully integrated the intrinsic motivational factors of games into vocabulary teaching, making learning more interesting and challenging and stimulating students' interest and motivation.

2.6.4 Forgetting Curve Theory

The theory of the forgetting curve was first proposed by the German psychologist Hermann Ebbinghaus in 1885, who found through experimental research that learned information is quickly forgotten after a while. The fastest rate of forgetting occurs in the

first few minutes and hours after the end of learning. As time passes, the rate of forgetting slows down, but forgetting continues. Ebbinghaus summarized this law of forgetting as a curve, the forgetting curve (Huang, 2021).

The Law of Forgetting Time of the Forgetting Curve suggests that within 20 minutes of learning, we may forget about 40% of the content. After a day, this figure may rise to about 66%. Therefore, it is important to review in a timely manner to consolidate memories before they are forgotten. According to students' experience in memorizing words, it usually takes 7 to 10 review cycles to transform vocabulary from short-term to long-term memory (Li, Zhou, & Liu, 2020).

Quizlet, as a learning tool, skillfully utilizes the principle of the forgetting curve to help students deepen their memory and improve vocabulary memorization by repeatedly presenting unfamiliar words to them. Through timely and targeted review, students can better cope with the challenges posed by the forgetting curve and improve their ability to memorize and apply knowledge in the long term.

In conclusion, in the field of education, Quizlet is unique in that it fully integrates psychological theories such as cognitive psychology, gamification education, intrinsic motivation theory, forgetting curve theory, etc., and skillfully integrates them into the teaching mode, providing a fun and challenging learning environment for students. Quizlet is a learning tool and a platform for education, offering students a more efficient and fun learning experience.

Table 2.2 Theoretical Foundations of Quizlet in Chinese Vocabulary Learning

Theory	Application in Study
Cognitive Psychology Theory	Quizlet utilizes the principles of cognitive psychology, including repeated exposure, individual differences, motivation, and spaced learning, to help students learn Chinese vocabulary more effectively.

Table 2.2 Theoretical Foundations of Quizlet in Chinese Vocabulary Learning (Cont.)

Theory	Application in Study
Gamification Learning Theory	Quizlet uses gamification theory to promote Chinese vocabulary learning, providing an interactive, enjoyable, and feedback-driven experience through a variety of game formats.
Internal Motivation Theory	Quizlet combines intrinsic motivation and gamification through engaging games that enrich Chinese vocabulary learning by being fun and challenging and increasing student motivation.
Forgetting Curve Theory	Quizlet cleverly applies the principle of the forgetting curve to enhance memory and long-term vocabulary retention through repeated exposure to new words.

Source: Researcher

2.7 Related Research and Study

In recent years, the Quizlet online learning platform has made significant progress in various subject areas, especially in language education. In teaching Chinese as a second language, Quizlet is widely used in classroom teaching and teaching assessment. This section will summarize the research on applying Quizlet in Chinese language learning and teaching.

Agustina (2018) conducted a study titled "Analysis of the Application of Game in Learning Chinese Vocabulary of Indonesian Students -- Based on Quizlet's Survey," which was conducted on 130 secondary school students from grades 7 to 11 at Anglo-Chinese School in Jakarta, to have explored the response of Indonesian Mandarin learners to the game-based vocabulary learning method. The study results showed that the students were 78.93% satisfied with Quizlet's online learning platform, confirming their satisfaction with Quizlet as a vocabulary learning aid. In addition, the study found that the features of Quizlet significantly impacted students' Chinese vocabulary learning with an impact rate of 0.706 points, accounting for 58% of the

impact on students' Chinese vocabulary learning. The results of this study emphasize the positive role and popularity of Quizlet as a gamified learning tool among Indonesian Chinese learners.

Lian (2018) conducted a study entitled "The Application of Online Tools in New Zealand Chinese Teaching- Illustrated by the example of Christchurch Boys' High School. Through literature analysis, classroom practice, and individual interviews, the study aims to discover the current situation and strengths and weaknesses of online tools in international Chinese teaching. The study results showed that teachers extensively used the online tool Quizlet in Chinese language classes to help students preview essential vocabulary. Through diverse learning and game sessions, students successfully mastered Chinese vocabulary. However, the problem is that Quizlet's competitive group learning model causes students to focus more on the results of the game competition than on learning the vocabulary itself, which may have distracted their attention. Finally, the researcher emphasizes the need to correctly handle the relationship between traditional teaching and teaching with online tools in classroom teaching and to strengthen the interaction between teachers and students.

Yao (2019) conducted a study entitled "Research on the effectiveness of educational games in improving Chinese learning motivation and Teaching effect -- Take the Confucius Institute of the University of Missouri as an example." The study was conducted with sixth-grade students, using both experimental and questionnaire methods to investigate the effectiveness of a classroom teaching format centered on the educational games Quizlet and Kahoot!. The study results showed that students in the experimental class were significantly more motivated to learn at the end of the teaching experiment. Their test scores were significantly higher than those of students in the regular class, which fully verified the positive effects of the educational games classroom teaching format in promoting students' motivation to learn and improving teaching effectiveness.

Shi (2019) conducted a study entitled "The application of three Learning apps in Chinese classrooms in American middle schools-illustrated by the case of Chinese exploring lessons in Smithton Middle School." The study selected 240-250 sixth-grade students in Smithton Middle School as the research objects. It used a literature review, classroom observation, and case study to compare the characteristics, strengths, and weaknesses of different Chinese online learning applications. The results of the study show that Quizlet provides essential flashcard functions to help students visualize the meaning of Chinese characters by matching them with pictures. Students can easily use Quizlet to learn individual characters' shapes, meanings, and pronunciations. Since Quizlet offers multiple learning modes, teachers can teach individual words and allow students to practice phrases and sentences. Students' use of this learning app stimulates learning, increases classroom participation, and helps them develop teamwork skills.

Zhao (2020) conducted a study entitled "Action research on gamification teaching of Chinese with Kahoot! and Quizlet". The study used an action research method, combined with actual classroom teaching records and questionnaires, to verify whether the use of Kahoot! and Quizlet for Chinese language teaching can increase students' interest in Chinese language learning, improve classroom efficiency, increase students' openness and classroom participation, as well as help students memorize vocabulary and learn the order of sentences, etc. The results of the study show that the two learning applications can increase the fun of learning, mobilize the classroom atmosphere, and improve students' classroom participation and frequency of oral expression. Students' performance also improved significantly, with vocabulary memorization accuracy significantly improved and sentence output correctness dramatically increased. However, Lina Zhao also pointed out the shortcomings of these online tools, including the competitive nature of the games that may lead to students' emotionalization, the increased number of idle chats among students during the games, and the lack of effective interaction between teachers and students.

Guo (2023) conducted a practical study entitled "Research of the application of game-based learning platform for vocabulary teaching in primary school: a case study of Singapore International School of Bangkok (Thonburi). This study was

conducted with 69 fifth-grade primary school students through literature research, classroom observation, and questionnaire survey. The purpose is to find out how to effectively utilize different online tools to assist Chinese language teaching in the classroom, achieve the expected teaching goals, and help teachers and students better adapt to online Chinese language teaching. This study found that Quizlet provides a multisensory learning model that can help students enhance vocabulary memorization. Students could sift through mastered vocabulary multiple times and memorize complex vocabulary through repetition. The study results showed that teachers felt that Quizlet made vocabulary teaching easier to implement and more fun. She also pointed out that the vocabulary pronunciation in the Quizlet application needed to be more standardized. She believed that the language input could be done manually.

Summarizing the above literature, the findings collectively reveal an obvious trend: the use of Quizlet in the Chinese classroom not only improves academic performance, but also develops students' comprehensive linguistic competence and motivation to learn, bringing new possibilities and opportunities for language education.



CHAPTER 3

RESEARCH METHODOLOGY

This chapter aimed to improve the Chinese vocabulary learning of Grade 5 students and increase their satisfaction with applying the Quizlet. In this chapter, the researcher introduced the research methodology, including the research design, the sample group, the research instruments used for data collection, and the assessment of the validity and reliability of the research instruments. Finally, the chapter also describes the methods used to analyze the data. The description is presented in the following order:

- 3.1 Research Design
- 3.2 Population and Sample
- 3.3 Research Instruments
- 3.4 Validity and Reliability
- 3.5 Data Collection Procedures
- 3.6 Data analysis

3.1 Research Design

In this study, the researcher collected quantitative data through Chinese vocabulary tests and a students' satisfaction questionnaire. The Chinese vocabulary test was divided into a pre-test and a post-test, which aimed to assess students' mastery of Chinese vocabulary before and after using Quizlet. The students' satisfaction questionnaire aimed to investigate students' contentment with the use of Quizlet in the process of Chinese vocabulary learning, as well as the effectiveness of Quizlet.

The diagram of the research design is illustrated in Figure 3.1 as follows:

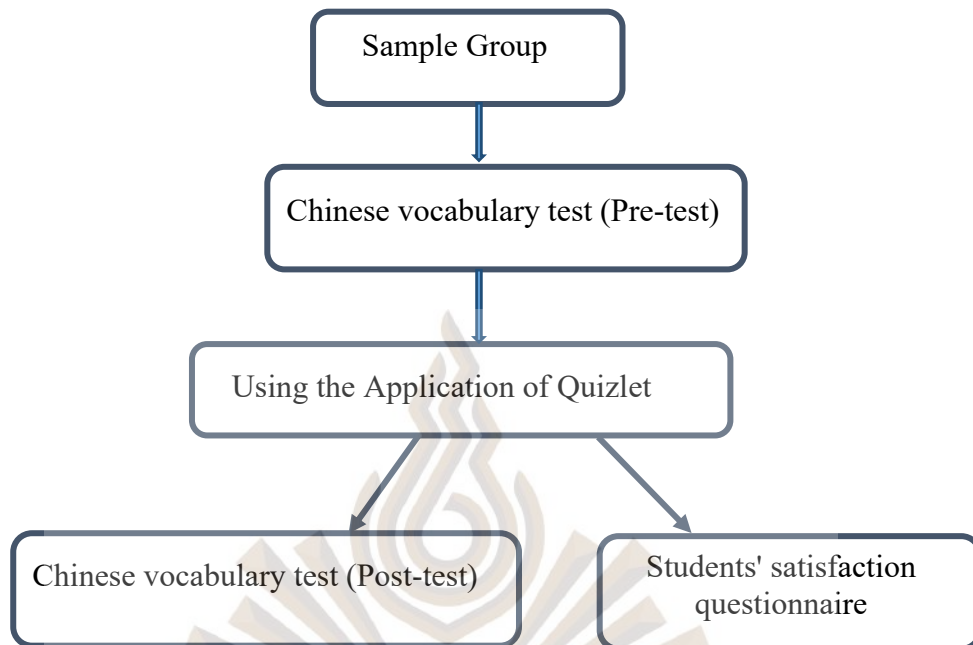


Figure 3.1 Research Design of the Study

3.2 Population and Sample

3.2.1 Population

The study's target population consisted of 71 students from three Grade 5 classes. The students' ages ranged around 10 to 11 years old, and they were of mixed genders and had mixed learning abilities.

3.2.2 Sample group

The researcher had chosen a cluster random sampling from the population as the sample group (26 students). The students were of mixed genders and had mixed learning abilities, with 13 boys and 13 girls.

3.2.3 Location

This study was carried out in a private school in Samut Prakran, one of the central provinces of Thailand, which was established in 2002. The school included 16 grades from kindergarten to high school and offered a Chinese language course from kindergarten 3 to high school. The school offered 1.67 hours of Chinese lessons per week for the primary level.

3.3 Research Instruments

This study used Three instruments to collect quantitative data: lesson plans, Chinese vocabulary tests (pre-test and post-test), and a students' satisfaction questionnaire.

3.3.1 Lesson Plan

The researcher designed four 100-minute lesson plans from the Grade 5 textbook on four topics. The lessons were conducted twice a week for a total of 8 sessions. The researcher taught twice a week for four weeks. Each class session was 50 minutes. The outline of the lesson plan is shown in Table 3.1 below. (For lesson plans, see Appendix A.)

Table 3.1 Lesson Plan Outline

Lesson	Topic	Learning Objectives	Learning Activities	Minutes
Week 1	Country	Students will be able to learn and master the Chinese vocabulary of different countries and use it in dialogue and communication.	Quizlet Matching Game: Students match flags with country names in English and Chinese, reinforcing language learning through visual and text recognition.	100

Table 3.1 Lesson Plan Outline (Cont.)

Lesson	Topic	Learning Objectives	Learning Activities	Minutes
Week 2	Place	Students will be able to learn and master Chinese vocabulary expressions for different locations and master the skills of asking.	Quizlet Learning Mode: Students utilize the "Learn" mode on Quizlet to study and memorize place names in Chinese, enhancing their recall and recognition skills.	100
Week 3	Daily activities	Students will be able to learn and master Chinese vocabulary related to daily activities and use it in conversation.	Quizlet Class Live: Through Quizlet's "Class Live" feature, students participate in group competitions to review vocabulary related to daily activities.	100
Week 4	Tableware	Students will be able to learn and master the Chinese vocabulary of different tableware and use them in conversation.	Quizlet Test Mode: Students use Quizlet's "Test Mode" to review and assess their understanding of tableware vocabulary.	100

3.3.2 Chinese Vocabulary Test

The Chinese vocabulary test was divided into a pre-test and a post-test, with the aim of comparing the sample group's Chinese vocabulary before and after using Quizlet. The test consisted of three parts: listening, reading comprehension, and oral test. The test format consisted of 20 multiple-choice questions and 2 oral quiz questions with a total score of 50 marks. (Details as shown in Appendix C)

3.3.3 Students' satisfaction Questionnaire

The students' satisfaction questionnaire was used to investigate students' contentment with Quizlet to learn Chinese vocabulary. The students' satisfaction questionnaire was divided into three parts: interest and motivation, engagement, and the effectiveness of Quizlet. (Details as shown in Appendix E)

The data were collected through students' responses to each item on a five-point Likert scale ranging from 1 to 5 as follows: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, (5) Strongly Agree. During the distribution of the students' satisfaction questionnaire, the researcher explained and justified each question to ensure that the participants accurately understood the students' satisfaction questionnaire. (See table 3.2)

Table 3.2 The Range of Mean Score Interpretation

Likert-Scale Description	Score Range	Students' Satisfaction Level
Strongly Agree	5.00-4.01	Highest
Agree	4.00-3.01	High
Neutral	3.00-2.01	Moderate
Disagree	2.00-1.01	Low
Strongly Disagree	1.00	Lowest

Source: Creswell, 2017

3.4 Validity and Reliability

3.4.1 Validity

In this research, a rigorous validation process was implemented to ensure the credibility of all research instruments before their application. To comprehensively understand and evaluate the effectiveness of these instruments, the study utilized the Item Objective Congruence (IOC) index. The IOC was calculated by applying the

formula: $IOC = \Sigma R/N$, in which ' ΣR ' represented the total score of the expert's rating and ' N ' represented the number of experts.

The validation of research instruments, including Lesson Plans, Chinese vocabulary Tests, and the Students' Satisfaction Questionnaire, was conducted by three experienced Chinese teachers in Thailand. The Item-Objective Consistency Index (IOC) was employed to ascertain whether the items align with the stated objectives, with scores ranging from -1 to +1.

The interpretation of IOC scores was as follows:

- 1) +1: The item perfectly aligns with the stated objectives.
- 2) 0: The item's alignment with the stated objectives is unclear.
- 3) -1: The item does not align with the stated objectives.

Additionally, the operational score range domain was from 0.67 to +1. Items scoring between 0.67 and 1.00 were retained as part of the instrument. Conversely, items below 0.67 were considered unclear and may have necessitated rephrasing or removal to ensure optimal instrument validity.

The IOC (Index of Consistency) results for the Lesson Plan, Chinese Vocabulary Test, and Student Satisfaction Questionnaire were +1. (Detail as shown in Appendix B, D, F)

3.4.2 Reliability

In research, reliability referred to the ability of a measurement tool to give similar and consistent results under different conditions and at different time intervals. The aim of reliability validation was to ensure that the research instrument measured the variable of interest consistently across multiple applications without being seriously affected by random errors, thus ensuring the trustworthiness of the research instrument.

The Kuder-Richardson Formula 20 (KR-20) was used to measure the reliability of the Chinese vocabulary test. Cronbach's Alpha was used to test the reliability of the Students' Satisfaction Questionnaire, with a target score above 0.7 as acceptable reliability. Items below this standard will be improved or discarded to ensure the reliability of the test.

The reliability of the test items was evaluated by administering the tests to 26 students outside the main sample group. After conducting a reliability of the Chinese vocabulary test and the Students' Satisfaction Questionnaire were 0.82 and 0.95, indicating the tests meet statistical reliability standards. Therefore, the test items were confirmed as reliable for use in data collection. (Detail as shown in Appendix I and J)

Table 3.3 Cronbach's Alpha Rule of Thumb

Cronbach's Alpha Rule of Thumb	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.8 \leq \alpha < 0.9$	Good
$0.7 \leq \alpha < 0.8$	Acceptable
$0.6 \leq \alpha < 0.7$	Questionable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

Source: Taber, 2018

3.5 Data Collection Procedures

3.5.1 Ethical Approval

To conduct this study, the researcher first obtained approval from Rangsit University and consent from the school principal and parents (see Appendix G). Then, the researcher collaborated with the school principal and the director of the Chinese department to collect information about students, class schedules, and curriculum content to develop lesson plans for experimental teaching.

Second, before the study, the researcher explained the research objectives and procedures to participants and obtained their consent, ensuring participants' privacy and confidentiality. The researcher conducted a pre-test to assess the students' Chinese vocabulary level.

Third, the researcher conducted experimental teaching using the Quizlet application based on the lesson plans for four weeks. The researcher taught two lessons per week, a total of 8 lessons, with each lesson lasting 50 minutes.

Finally, after four weeks of treatment, participants took a post-test using the same topics as the pre-test. Students were then given a students' satisfaction Questionnaire to rate their satisfaction with each item using a five-point Likert scale from 1 to 5.

3.5.2 Confidentiality

The researcher kept all information concerning students' bio-data and satisfaction questionnaire responses confidential. The researcher also removed all data after the study was finished.

3.6 Data Analysis

The data was analyzed using two methods based on the two research objectives. The first method was to analyze the quantitative data from the pre-test and post-test to examine the sample group's improvement after using the Quizlet application to learn Chinese vocabulary. The second method focused on collecting quantitative data through students' satisfaction questionnaires to assess students' contentment with using Quizlet in Chinese vocabulary learning.

3.6.1 Chinese vocabulary Test Analysis

In order to compare the students' Chinese vocabulary after using the Quizlet application, information was collected through a pre-test and a post-test. The collected data was then analyzed using a t-test dependent sample.

3.6.2 Analysis of Students' satisfaction

To investigate students' contentment with using the Quizlet application, data were collected using a Students' Satisfaction Questionnaire. Mean and standard deviation were used to statistically analyze the students' responses to each item.



CHAPTER 4

DATA ANALYSIS

In this chapter, a quasi-experimental design was used to compare the development of Chinese vocabulary learning of Grade 5 students before and after using the application of Quizlet and to investigate students' satisfaction towards using the application of Quizlet in Chinese vocabulary learning. The results were obtained from pre-test, post-test, and questionnaire. The results of the data are presented in the following order:

- 4.1 Analysis of Chinese Vocabulary Test Scores
- 4.2 Analysis of Students' Satisfaction Questionnaire

4.1 Analysis of Chinese Vocabulary Test Scores

The purpose of this study was to present the results of the first research question. This question was to investigate whether the application of Quizlet could be used to improve Grade 5 Thai student's Chinese vocabulary learning. The results were derived from the pretest and post-test. Two assessors are involved in the assessment to prevent bias. The pretest and post-test results of the sample group were compared using a paired sample t-test with $p < 0.05$ as the significance level, mean value, standard deviation, and inferential statistics were used for comparison.

4.1.1 Comparison of Pretest and Posttest Scores of the Sample Group

The data presented in Table 4.1 shows that the sample group made significant progress between the pre-test and post-test. In the pre-test, the students' minimum score was 8, and the maximum score was 41 (out of a total of 50), which is a significant difference in scores. In the post-test, the minimum score increased to 18, and the

maximum score reached 48 (out of a total of 50). In addition, two participants made the most remarkable improvement; the percentage difference between the pretest and posttest was 48% and 40%. All 26 participants showed varying degrees of improvement in their scores, ranging from 5 to 24 points. The mean score of the sample group increased from 22.12 to 34.08, an average improvement of 11.96 points or 23.92%.

Table 4.1 shows the scores, score increases, and percentage differences between the pretest and posttest for the participants.

Table 4.1 Pre-test & Post-test scores of the sample group

Student ID	Pre-test Scores (Full Score=50)	Post-test Scores (Full Score=50)	Increase in test score	Differences of the increased scores
1	29	39	10	20.00%
2	18	25	7	14.00%
3	29	37	8	16.00%
4	23	40	17	34.00%
5	30	41	11	22.00%
6	20	29	9	18.00%
7	41	48	7	14.00%
8	14	34	20	40.00%
9	28	38	10	20.00%
10	24	37	13	26.00%
11	32	37	5	10.00%
12	24	35	11	22.00%
13	14	38	24	48.00%
14	12	27	15	30.00%
15	16	27	11	22.00%
16	18	30	12	24.00%
17	20	33	13	26.00%
18	16	32	16	32.00%
19	26	36	10	20.00%
20	18	35	17	34.00%

Table 4.1 Pre-test & Post-test scores of the sample group (Cont.)

Student ID	Pre-test Scores (Full Score=50)	Post-test Scores (Full Score=50)	Increase in test score	Differences of the increased scores
21	8	18	10	20.00%
22	18	27	9	18.00%
23	16	26	10	20.00%
24	18	29	11	22.00%
25	33	45	12	24.00%
26	30	43	13	26.00%
Mean scores	22.12	34.08	11.96	23.92%

When comparing the raw scores of the pre-test and post-test, the results showed that all 26 participants scored higher on the post-test than on the pre-test. The following comparisons were made Based on the pre-test and post-test scores.

4.1.2 Analysis of Paired Sample t-test

The analysis of Chinese vocabulary learning tests scores obtained from the pretest and posttest using paired sample statistics (t-test for dependent sample) revealed a positive result, as shown in Table 4.2 below.

Table 4.2 Paired Samples t-test

Group	n	Pretest		Posttest		Mean difference	t	p - value
		\bar{X}	SD	\bar{X}	SD			
Sample Group	26	\bar{X}	SD	\bar{X}	SD	11.96	-14.49	0.000
		22.12	7.72	34.08	6.90			

* $p < .05$

According to Table 4.2, paired-sample analysis of test scores revealed positive results. The pretest mean was 22.12, with a standard deviation of 7.72, while the posttest mean was 34.08, with a standard deviation of 6.90. The difference between the pretest and posttest means is 11.96, demonstrating an increase in the posttest mean. The obtained p - value was .01, which was less than .05 ($p < .05$), indicating a statistically significant improvement in the sample group's posttest score compared to the pretest score. This demonstrated that the students' post-test scores differed from the mean, indicating a more credible result.

4.1.3 Pretest and Posttest Comparison

Figure 4.1 below represents participants' pre-test and post-test scores. As shown in the figure, the blue line represents the pre-test score, and the orange line represents the post-test score. It can be seen that all students' scores in the post-test increased, indicating that using the Quizlet application helped to improve students' Chinese vocabulary learning.

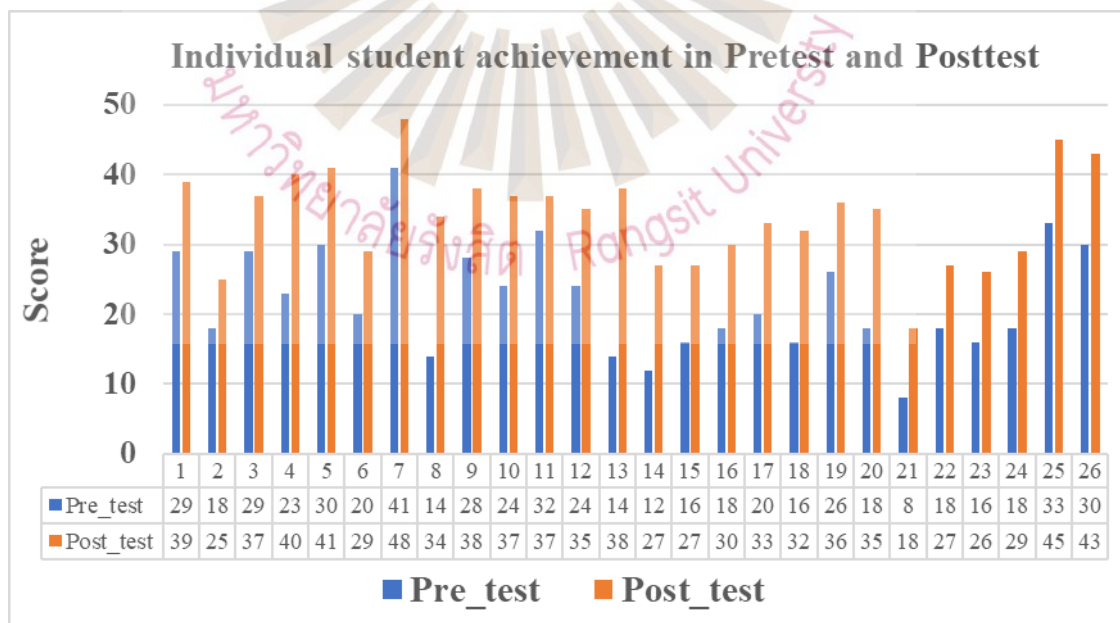


Figure 4.1 Graphical representation of students' pretest and posttest scores

In addition, Figure 4.2 shows the mean scores for the pretest and posttest, which were 22.12 and 34.08. The mean score for the post-test was higher than the mean score for the pretest. The post-test scores, represented by the orange bar, confirmed an increase of 11.96 points compared to the pretest scores, represented by the blue bar. So, each person progressed in the posttest and got a better score.

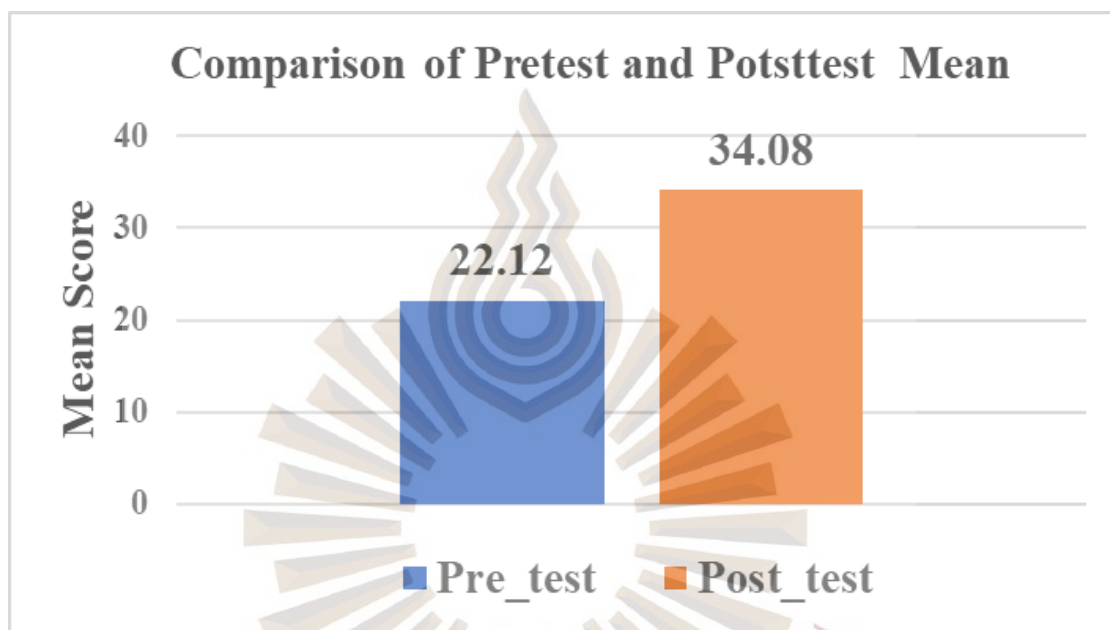


Figure 4.2 Comparison of the overall pre-test and post-test mean score

4.2 Student Satisfaction Questionnaire Analysis

A five-point Likert scale was adopted to collect quantitative data and study students' satisfaction with using the application of Quizlet in Chinese vocabulary learning: 1 = strongly disagree, 5 = strongly agree. The questionnaire consisted of 15 items divided into three parts, Part A: Interest and motivation, Part B: Engagement, and Part C: The effectiveness of Quizlet. All 26 (n = 26) study participants were given questionnaires. Descriptive statistics (mean and standard deviation) were used to analyze the survey results. The average score was highest at 4.01 ~ 5.00, high at 3.01 ~ 4.00, medium at 2.01 ~ 3.00, low at 1.01 ~ 2.00, and lowest at 1.00 ~ 0.00.

Table 4.3 Questionnaire of the Sample Group

Item	N	Mean	Interpretation
Part A	26	4.01	Highest
Part B	26	4.11	Highest
Part C	26	4.06	Highest
Total	26	4.06	Highest

A questionnaire was administered to all 26 (n=26) study participants. From the table 4.3 above, it can be seen that the mean scores were 4.01, 4.11, and 4.06 for part A, part B and part C respectively, which were all at the highest level. The overall average was also at the highest level with the figure of 4.06.

4.2.1 Analysis of Questionnaire Part A: Interest and Motivation

Table 4.4 shows the mean scores and standard deviations of students' satisfaction with Part A: Interest and Motivation. Item 3, Using Quizlet helps me build confidence in learning Chinese vocabulary, had the highest mean (\bar{x}) score of 4.19. Although item 4, Using Quizlet increases my enthusiasm for learning Chinese vocabulary, was the lowest mean score ($\bar{x} = 3.88$), it is still at a high level; the interpretation of the mean scores showed that students' satisfaction, interest, and motivation for Part A of the questionnaire were still at the highest level ($\bar{x} = 4.01$).

Table 4.4 Analysis of Questionnaire Part A: Interest and Motivation

No.	Part A- Interest & Motivation	Mean	SD	Interpretation
1	Using Quizlet increases my interest in learning Chinese vocabulary.	3.92	0.74	high
2	Using Quizlet improves my motivation to learn Chinese vocabulary.	4.08	0.80	highest
3	Using Quizlet helps me to build confidence in learning Chinese vocabulary.	4.19	0.69	highest

Table 4.4 Analysis of Questionnaire Part A: Interest and Motivation (Cont.)

No.	Part A- Interest & Motivation	Mean	SD	Interpretation
4	Using Quizlet increases my enthusiasm for learning Chinese vocabulary.	3.88	1.07	high
5	Using Quizlet makes the learning process more meaningful.	3.96	0.82	high
	Average	4.01	0.82	highest

4.2.2 Analysis of Questionnaire Part B: Engagement

Table 4.5 below shows the mean and standard deviation for students' satisfaction with Part B: Engagement. From the data, item 7, "Quizlet's flashcards and games keep my learning highly engaging and interesting," was rated with the highest mean score of 4.31, and item 6, "Using Quizlet enhances my engagement in learning Chinese vocabulary," was the lowest mean score ($\bar{x} = 3.88$). Nevertheless, with an average score of 4.11, it categorically aligns within the spectrum of "Highest" average scores.

Table 4.5 Analysis of Questionnaire Part B: Engagement

No.	Part B- Engagement	Mean	SD	Interpretation
6	Using Quizlet enhances my engagement in learning Chinese vocabulary.	3.88	0.91	high
7	Quizlet's flashcards and games keep my learning highly engaging and interesting.	4.31	0.68	highest
8	Using Quizlet deeply engages me in the process of learning Chinese vocabulary.	4.15	0.67	highest
9	Interacting with Quizlet enhances my overall experience of learning Chinese vocabulary.	4.08	0.63	highest

Table 4.5 Analysis of Questionnaire Part B: Engagement (Cont.)

No.	Part B- Engagement	Mean	SD	Interpretation
10	Quizlet's various learning tools increase my willingness to participate in all learning activities.	4.12	0.77	highest
	Average	4.11	0.73	highest

4.2.3 Analysis of Questionnaire Part C: The Effectiveness of Quizlet

Table 4.6 below illustrates the mean scores and standard deviations of students' satisfaction with Part C: The Effectiveness of Quizlet. Item 12, "Using Quizlet helps me understand the meaning of Chinese vocabulary," was the highest mean score of 4.23. Items 11, 13, and 15 had the lowest average score of 4.00. In terms of the overall mean score, it was still at the highest level. Therefore, most students thought that using Quizlet's application helped improve their Chinese vocabulary learning. The average score was 4.06, at the "highest" level.

Table 4.6 Analysis of Questionnaire Part C: The Effectiveness of Quizlet

No.	Part C- The Effectiveness of Quizlet	Mean	SD	Interpretation
11	Using Quizlet helps me to practice the pronunciation of Chinese vocabulary.	4.00	0.94	high
12	Using Quizlet helps me understand the meaning of Chinese vocabulary.	4.23	0.71	highest
13	Using Quizlet improves my memory of Chinese vocabulary.	4.00	0.63	high
14	Using Quizlet helps me to improve my ability to apply Chinese vocabulary.	4.08	0.74	highest
15	Using the learning tools on Quizlet to help me learn Chinese vocabulary more efficiently.	4.00	0.63	high
	Average	4.06	0.73	highest

Finally, as mentioned above, part B had the highest mean score among the three parts, with a mean of 4.11 and a standard deviation of 0.73. In contrast, part C had relatively lower mean scores, with an average score of 4.06 and a standard deviation of 0.76, and part A had the lowest mean score, with a mean of 4.01 and a standard deviation of 0.82. Nevertheless, considering the overall mean of 4.06, the researcher was convinced that the students were positively satisfied with using the application of Quizlet in Chinese vocabulary learning.



CHAPTER 5

CONCLUSION, DISCUSSION AND RECOMMENDATION

This chapter presented the summary of the study and the details presented in the following order:

- 5.1 Conclusion
- 5.2 Discussion
- 5.3 Recommendations

5.1 Conclusion

The two research objectives were stated for this study:

- 1) To compare the grade 5 Thai students' Chinese vocabulary learning before and after using the Application of Quizlet.
- 2) To investigate grade 5 Thai students' satisfaction towards the use of the Application of Quizlet in Chinese vocabulary learning.

The study employed a quantitative methodology which included pre-test, post-test, and questionnaire administered to grade 5 Thai students in Thailand. The findings led to the following conclusions:

5.1.1 The Result of Pretest and Posttest Data Analysis

This study aimed to improve the Chinese vocabulary learning of Grade 5 Thai students by using the application of Quizlet. Following the pre-test and post-test results, a paired sample t-test was conducted to compare the learning performance within one group of students.

The application of Quizlet provides an efficient and interactive platform for Chinese vocabulary learning, which greatly promotes students' motivation and improves learning efficiency. Through its rich learning modes, such as flashcards, game-based learning and tests, students are able to master and consolidate new vocabulary in various ways.

The findings of the study can be concluded as follows:

1) The statistical analysis of the paired samples t-test of academic performance showed that the average score of the post-test (34.08) was higher than that of the pre-test (22.12), with an average difference of 11.96 (23.92%). The pre-test and post-test standard deviations were (7.72) and (6.90), respectively. The average score of the post-test was higher than that of the pre-test.

2) The pre-test yielded a highest score of 41 and a lowest score of 8, while the post-test resulted in a highest score of 48 and a lowest score of 18. Consequently, the difference between the pre-test and post-test scores led to the highest score on the post-test being 7 points higher than the score on the pre-test. Similarly, the lowest score in the post-test is 10 points higher than the lowest score in the pre-test.

3) Most of the participants, 18 out of 26, scored above 30 on the post-test. In contrast, only five students scored 30 or higher on the pre-test, while the rest scored below that level.

4) For all 26 students, all participants scored higher on the post-test than on the pre-test. The improvement in scores ranged from 5 to 24 points, respectively.

The quantitative data analysis above revealed a significant improvement in students' post-test results. Thus, this study's results indicated that using Quizlet's application could effectively improve the Chinese vocabulary learning of Grade 5 students in Thailand.

5.1.2 The Results of Students' Satisfaction Questionnaire Analysis

The second objective of this study was to investigate grade 5 Thai students' satisfaction towards the use of the Application of Quizlet in Chinese vocabulary learning. The Quantitative data concerning this objective was collected through a questionnaire containing 15 items, which were further divided into three parts:

Part A: Interest and motivation

Part B: Engagement

Part C: The Effectiveness of Quizlet

1) According to the data in Part A of the questionnaire, it showed that students had the highest level of interest in using the application of Quizlet for Chinese vocabulary learning. (mean=4.01, SD=0.82).

2) According to the data in Part B of the questionnaire, it showed that students had the highest level of engagement in using the application of Quizlet for Chinese vocabulary learning. (mean=4.11, SD=0.73).

3) According to the data in Part C of the questionnaire, it showed that students had the highest level of effectiveness of using the application of Quizlet for Chinese vocabulary learning. (mean=4.06, SD0.73).

The total average mean score for the three parts of the questionnaire was 4.06 with a standard deviation of 0.76, indicating that students were highest satisfied with the use of Quizlet application.

5.2 Discussion

There were two key findings in this study. The first finding proved that using the application of Quizlet can improve grade 5 Thai students' Chinese vocabulary learning. The second finding was that students were satisfied with using Quizlet to learn Chinese vocabulary. The following discussion will summarize the findings in detail and explain how they effectively address the questions posed by this study.

5.2.1 Chinese vocabulary learning Test Data

The results of the test showed that using the application of Quizlet improved Grade 5 Thai students' Chinese vocabulary learning. All 26 participants achieved higher mean scores on the post-test (34.08) than on the pre-test (22.12). In addition, students No.8 and No.13 made the most remarkable improvement; the percentage difference between the pretest and posttest was 40% and 48%. Although Student No.7 improved by only 7 points, he consistently scored at the top in the pre-test and post-test, showing his already excellent Chinese vocabulary. On the other hand, Student No. 11 improved by only 5 points, from 32 to 37, which was the smallest improvement among his classmates. Nonetheless, their scores were still considered above average, indicating that they have a solid Chinese foundation and the potential for further development. Therefore, using Quizlet positively impacted Chinese vocabulary learning; all findings from the pre-test and post-test were reliable answers to the first research question.

The Quizlet application is an effective tool for learning Chinese vocabulary as it combines an interactive and multi-sensory approach with flashcards, games, and auditory and visual aids to cater to a wide range of learning styles and preferences. The tool also employs a spaced repetition algorithm to enhance memory and provides instant feedback through tests. Its comprehensiveness dramatically facilitates students' understanding, pronunciation, and remembering Chinese vocabulary. This has also been proved in previous studies. A study by Setiawan and Wiedarti (2020) also showed that using the Quizlet application significantly increased students' motivation to learn vocabulary. Students reported that after using the Quizlet application, they felt more excited and less likely to be bored, thus maintaining a strong interest in vocabulary learning. To Wu (2023) explored the effectiveness of Quizlet in Chinese vocabulary learning and found that learners could learn Chinese vocabulary more attractively and flexibly through Quizlet, which not only increased learners' motivation but also enhanced their ability to self-evaluate their learning progress and thus improved their learning effectiveness. Moreover, Ma (2024) showed that Quizlet can significantly improve foreign language learners' listening, speaking, and reading skills

and that its interactivity and multiple learning modes, such as flashcards, games, and quizzes, provide a dynamic and engaging way of practicing these linguistic elements.

5.2.2 Students' Satisfaction

The quantitative data were collected using a five-point Likert scale to examine students' satisfaction with using the Quizlet application in Chinese vocabulary learning: 1 = strongly disagree, 5 = strongly agree. The questionnaire consists of 15 items divided into three parts: Part A: Interest and Motivation, Part B: Engagement, and Part C: The Effectiveness of Quizlet. All 26 (n =26) study participants were given questionnaires. Descriptive statistics (mean and standard deviation) were used to analyze the survey results.

The data in Part A of the questionnaire showed that the application of Quizlet positively impacted students' interest and motivation, with a mean score of 4.01 (SD=0.82) indicating the highest level of satisfaction. Item 3: "Using Quizlet helps me build confidence in learning Chinese vocabulary " had the highest mean score of 4.19 (SD=0.69). This result clearly shows that students can be more confident in learning Chinese vocabulary by using the Quizlet application. This confidence building not only enhances students' confidence in their learning ability but also stimulates their interest and motivation in learning. This finding is consistent with the results of a previous study by Sitorus (2023). The study found that using the Quizlet application increased students' self-confidence, motivation, and interest in learning. As a result, they were more willing to participate in vocabulary learning activities and more engaged with the content. Tran and Nguyen's (2023) study highlights the importance of interactive and diverse learning modes in Quizlet applications for stimulating students' interest in learning. They pointed out that these interactive learning models not only make the learning process more interesting but also cater to the learning preferences of different learners.

The results of Part B of the questionnaire indicate that the Quizlet application successfully increased student engagement. The mean score of 4.11 (SD= 0.73)

reflects the highest level of satisfaction, indicating that Quizlet stimulated active student participation and significantly increased their overall satisfaction with the learning process. In this part, item 7 said, "Quizlet's flashcards and games keep my learning highly engaging and interesting." received the highest mean score of 4.31 (SD = 0.68). This suggests that Quizlet's flashcards and game features are critical to motivating student engagement. This has also been widely confirmed by previous studies. Ma (2024) highlights the important role of Quizlet's gamification features in educational technology, especially in the field of foreign language learning. Quizlet transforms learning materials into interactive games and challenges, greatly enhancing students' learning engagement. In addition, it was found that deploying Quizlet within a flipped classroom framework greatly increased student engagement in vocabulary learning through increased student autonomy, interactivity, and immediate feedback (Muhammad, Rochmah, & Asmara, 2024)

The results of Part C of the questionnaire showed that the Quizlet application successfully improved students' Chinese vocabulary learning. The mean score of 4.06 (SD= 0.73), with the highest level of satisfaction, indicates that learners generally regarded Quizlet as an efficient learning tool. Item 12 in the questionnaire, "Using Quizlet helps me understand the meaning of Chinese vocabulary," received a mean score of 4.23 with a standard deviation of 0.71. This score is the highest among the items related to the effectiveness of Quizlet, indicating that learners found Quizlet particularly effective in aiding their comprehension of the meanings of Chinese vocabulary. This suggests that Quizlet not only helps with rote memorization but also improves comprehension of new words, which is essential for language learning and practical application. Tanjung (2023) also confirms that Quizlet provides a conducive environment for vocabulary learning with its interactive features and diverse learning modes. This support helps students grasp and retain new vocabulary more effortlessly. Gao Zewen's study demonstrates that Quizlet effectively improves vocabulary learning. It shows that using Quizlet increases student participation and makes learning more efficient. The platform's interactive features lead to better memory and understanding of new words. This research suggests Quizlet is a valuable educational

tool, enhancing learning through digital means and personalized experiences (Gao, 2023).

In conclusion, the application of Quizlet significantly improved Thai students' Chinese vocabulary learning through pre-test and post-test. In addition, students' satisfaction with Quizlet was the highest, indicating that it successfully improved learning efficiency and provided a fun learning experience.

5.3 Recommendations of the Study

Based on the findings and conclusions of the study, the following recommendations are proposed:

5.3.1 Recommendation for Implementation

1) The application of Quizlet to improve Chinese vocabulary learning of Grade 5 students in Thailand has proved beneficial. However, this study was limited to only eight lessons. To collect more comprehensive data and achieve better learning outcomes, it is recommended that schools and educators extend the use of the Quizlet application to the standard Chinese curriculum.

2) Using the Quizlet application for Chinese vocabulary learning with Grade 5 students has successfully received positive feedback from learners. Therefore, we recommend that Chinese teachers at all grade levels incorporate the Quizlet application into their teaching to increase student motivation and engagement in learning Chinese.

3) Although the Quizlet application is effective for learning Chinese vocabulary, it is important to maintain classroom order. Thoughtful incorporation of Quizlet can support instructional goals without distracting students.

5.3.2 Recommendations for Future Research

Considering some limitations of this study, the researcher suggests the following for further research:

1) The study was limited to 26 Thai students from private school. In future studies, similar studies could be conducted using a larger sample size, students in different grades, and schools in different locations in Thailand, which would help to confirm and ensure the reliability of the conclusions drawn from this study.

2) This study was limited to four topics from Chinese textbooks. However, in order to improve our understanding of Chinese vocabulary teaching, future research should include a variety of content from different sources to evaluate vocabulary learning strategies in different contexts.

3) This study aimed to enhance students' ability to learn Chinese vocabulary. Future research could investigate the effects of Quizlet on Chinese pronunciation, writing, grammatical comprehension, and cultural literacy.

All details of this study have been presented. In conclusion, the use of Quizlet has a positive impact on students' Chinese vocabulary learning. As an innovative language teaching method, Quizlet has improved classroom efficiency and student participation. As a result, students' interest in Chinese vocabulary, confidence and use of the language have increased significantly. Integrating Quizlet into Chinese vocabulary learning along with other well-designed classroom activities proved to be very effective.

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APPENDIX A
LESSON PLANS

Lesson Plan1

Subject: Chinese

Topic: Country

Class Size: 26 students

Time: 100 minutes (50 minutes/ per session)

Teaching and learning strategy: Integrating Quizlet Application into Chinese Vocabulary Learning.

Teaching and learning materials: Experience Chinese textbook and exercise book (Grade5)、laptop、projector、whiteboard、whiteboard marker、world map、paper、pencils and eraser.

Teaching Objectives:

- ✓ **Vocabulary Mastery:** Students will learn and master the expressions of the Chinese names of different countries, such so 泰国 (Thailand), 日本 (Japan), 韩国 (South Korea), 澳大利亚 (Australia), 美国 (United States), 英国 (United Kingdom), and 法国 (France).
- ✓ **Conversational Skills:** Students will be able to engage in dialogues, asking and answering questions about nationalities using sentences like "她是泰国人吗?" (Is she Thai?) and responding affirmatively "是, 她是泰国人。" (Yes, she is Thai) or negatively "(不是, 她是中国人。)" (No, she is Chinese).
- ✓ **Intercultural Competence:** Students will develop the ability to express their own and others' nationalities in simple and fluent sentences, fostering intercultural understanding, respect, and acceptance of people from various countries.

Content	
Stage	Activities
Warm-up	<ul style="list-style-type: none"> ✓ Greetings and attendance: Start the class with a friendly greeting and quickly mark the attendance. ✓ Map discussion: Use a map to have students locate and talk about countries they know, enhancing their geographic knowledge. ✓ Whiteboard Vocabulary: Write the Chinese names of the discussed countries on the whiteboard to prepare for Chinese vocabulary learning.
Instruction	<ul style="list-style-type: none"> ✓ Quizlet Flashcards Presentation: Project Quizlet flashcards onto the whiteboard, showing the Chinese characters for each country name, along with its pinyin, an image of the flag, and the English translation, such as 泰国 (Thailand), 日本 (Japan), 韩国 (South Korea), 澳大利亚 (Australia), 美国 (United States), 英国 (United Kingdom), and 法国 (France). ✓ Improving language skills: Teachers use the images on Quizlet flashcards to demonstrate the usage scenarios and cultural connotations of words, helping students improve their language skills through word-building and sentence-building activities. ✓ Dialogue Practice: Move into a targeted dialogue practice using the newly learned country vocabulary. Provide students with the sentence structure for asking about nationality: “你是泰国人吗？” (Are you Thai?). Guide students through responding affirmatively with“是的, 我是。” (Yes, I am.) or negatively with “不是, 我不是。” (No, I'm not.).

Content	
Stage	Activities
Learning Activities	<ul style="list-style-type: none"> ✓ Quizlet Matching Game: Students match flags with country names in English and Chinese, reinforcing language learning through visual and text recognition. ✓ Dialogue exercise: Students work in pairs to practice asking and answering questions about nationality using phrases learnt from Quizlet. ✓ Pinyin Writing Exercise: Complete the assignments in the textbook and exercise book to practice the written pinyin for the names of different countries, such as 泰国 (tài guó), 中国 (zhōng guó).
Summary	<ul style="list-style-type: none"> ✓ Quick Review: Review key Chinese vocabulary and sentences learned today. ✓ Answer Questions: Answer any questions students may have to clarify understanding. ✓ Homework Assignment: Assign the task of reviewing the lesson material on Quizlet. ✓ (https://quizlet.com/857043216/p5-lesson1-国家-flash-cards/?funnelUUID=0f979aad-bb11-4c62-bc17-cb0250cd2f08)

Lesson Plan2

Subject: Chinese

Topic: Place

Class Size: 26 students

Time: 100 minutes (50 minutes/ per session)

Teaching and learning strategy: Integrating Quizlet Application in Chinese Vocabulary Learning

Teaching and learning materials: Experience Chinese textbook and exercise book (Grade5)、laptop、projector、whiteboard、whiteboard marker、paper, pencils and eraser.

Teaching Objectives:

- ✓ **Vocabulary Mastery:** Students will learn and master expressions for various places in Chinese, such as 家 (home), 超市 (supermarket), 车站 (station), 小吃店 (snack bar), 公园 (park), 便利店 (convenience store), 运动场 (sports field), 哪里 (where), 这里 (here), and 那里 (there).
- ✓ **Conversational Skills:** Students will learn to accurately use location-related pronouns in dialogues, asking and answering questions about places, such as "超市在哪里?" (Where is the supermarket?) and replying with "超市在这里。" (The supermarket is here.) or "超市在那里。" (The supermarket is there.)
- ✓ **Everyday Communication Enhancement:** Students will develop the ability to effectively engage in daily Chinese conversations, improving their practical communication skills.

Content	
Stage	Activities
Warm-up	<ul style="list-style-type: none"> ✓ Greetings and attendance: Start the class with a friendly greeting and quickly mark the attendance. ✓ Group discussion: Students are divided into 6 groups. The task of each group is to list some places near their school or home and describe their features and functions. ✓ Whiteboard Vocabulary: Write the Chinese names of the discussed places on the whiteboard to prepare for Chinese vocabulary learning.
Instruction	<ul style="list-style-type: none"> ✓ Quizlet Flashcards Presentation: Use Quizlet to project place names on the White Board, displaying the Chinese characters, pinyin, corresponding pictures and English translations of names such as 家 (home), 超市 (supermarket), 车站 (station), 小吃店 (snack bar), 公园 (park), 便利店 (convenience store), 运动场 (sports field), 哪里 (where), 这里 (here), and 那里 (there). ✓ Improving language skills: Teachers use the images on Quizlet flashcards to demonstrate the usage scenarios and cultural connotations of words, helping students improve their language skills through word-building and sentence-building activities. ✓ Dialogue Practice: Engage students in practicing dialogues that incorporate the newly learned vocabulary for places. They will use the structure "超市在哪里?" (Where is the supermarket?) and reply with "超市在这里。" (The supermarket is here.) or "超市在那里。" (The supermarket is there.).

Content	
Stage	Activities
Learning Activities	<ul style="list-style-type: none"> ✓ Quizlet Learning Mode: Students utilize the "Learn" mode on Quizlet to study and memorize place names in Chinese, enhancing their recall and recognition skills. ✓ Dialogue exercise: Students pair up to practice asking and answering questions about locations using phrases learned from Quizlet, such as A:超市在哪里? B:超市在这里。 ✓ Pinyin Writing Exercise: Students complete written tasks in their textbooks and exercise books to practice the pinyin for the names of different places, like家 (jiā), 超市 (chāo shì), 车站 (chē zhàn).
Summary	<ul style="list-style-type: none"> ✓ Quick Review: Review key Chinese vocabulary and sentences learned today. ✓ Answer Questions: Answer any questions students may have to clarify understanding. ✓ Homework Assignment: Assign the task of reviewing the lesson material on Quizlet. (https://quizlet.com/838259833/p5-lesson2-场所-flash-cards/?funnelUUID=32b7c27a-6205-4bb3-9da4b78ca51018fa)

Lesson Plan3

Subject: Chinese

Topic: Daily activities

Class Size: 26 students

Time: 100 minutes (50 minutes/ per session)

Teaching and learning strategy: Integrating Quizlet Application in Chinese Vocabulary Learning.

Teaching and learning materials: Experience Chinese textbook and exercise book (Grade5)、laptop、projector、whiteboard、whiteboard marker、paper, pencils and eraser.

Teaching Objectives:

- ✓ **Vocabulary Mastery:** Students will learn and master expressions for various activities in Chinese, such as 看报 (reading newspaper), 洗衣服 (doing laundry), 睡觉 (sleeping), 上网 (surfing the internet), 打电话 (making phone calls), 吃饭 (having meals).
- ✓ **Conversational Skills:** Students will use the vocabulary they have learned for everyday communication. For example, they will be able to ask questions such as 妈妈在干什么? (What is Mummy doing?) and answer questions like 妈妈在洗衣服。 (Mom is doing laundry.)
- ✓ **Everyday Communication Enhancement:** Students will develop the ability to effectively engage in daily Chinese conversations, improving their practical communication skills.

Content	
Stage	Activities
Warm-up	<ul style="list-style-type: none"> ✓ Greetings and attendance: Start the class with a friendly greeting and quickly mark the attendance. ✓ Group discussion: Facilitate interactive group discussions and encourage students to share their daily lives and preferences. Ask questions such as “What activities do you usually do in your daily life?” and “What is your favourite daily activity?” ✓ Whiteboard Vocabulary: Write down the Chinese names of different daily activities on the whiteboard to prepare for learning Chinese vocabulary.
Instruction	<ul style="list-style-type: none"> ✓ Quizlet Flashcards Presentation: Use Quizlet to display a variety of daily activities on the whiteboard, showing Chinese characters, pinyin, pictures, and English translations. Examples include reading the newspaper (看报), doing laundry (洗衣服), going to bed (睡觉), surfing the internet (上网), making a phone call (打电话), and eating a meal (吃饭). ✓ Improving language skills: Teachers use the images on Quizlet flashcards to demonstrate the usage scenarios and cultural connotations of words, helping students improve their language skills through word-building and sentence-building activities. ✓ Dialogue practice: Students will be given dialogue practice incorporating newly learnt vocabulary for daily activities. They will use the structure "妈妈在做什么?" and then respond with "妈妈在洗衣服。" etc. to reinforce their understanding and use of the language.

Content	
Stage	Activities
Learning Activities	<ul style="list-style-type: none"> ✓ Quizlet Class Live: Through Quizlet's "Class Live" feature, students participate in group competitions to review vocabulary related to daily activities. ✓ Pair work: Students work together in pairs to practice asking and answering questions about daily activities using phrases learned from Quizlet. ✓ Pinyin Writing Exercise: Students complete written tasks in their textbooks and exercise books to practice the pinyin for the names of different daily activities, like 看报 (kàn bào), 洗衣服 (xǐ yī fú).
Summary	<ul style="list-style-type: none"> ✓ Quick Review: Review key Chinese vocabulary and sentences learned today. ✓ Answer Questions: Answer any questions students may have to clarify understanding. ✓ Homework Assignment: Assign the task of reviewing the lesson material on Quizlet. https://quizlet.com/831646918/p5-lesson3-日常活动-flash-cards/?funnelUUID=49715a10-b0e7-4344-b263-4e949dc2ad60

Lesson Plan4

Subject: Chinese

Topic: Tableware

Class Size: 26 students

Time: 100 minutes (50 minutes/ per session)

Teaching and learning strategy: Integrating Quizlet Applications in Chinese Vocabulary Learning.

Teaching and learning materials: Experience Chinese textbook and exercise book (Grade5)、laptop、 projector、 whiteboard、 whiteboard marker、 paper、 pencils and eraser.

Teaching Objectives:

- ✓ **Vocabulary Mastery:** Students will learn and master different expressions for tableware in Chinese, such as 客人guests, 杯子cups, 盘子plates, 筷子 chopsticks, 勺子spoons and 叉子forks.
- ✓ **Conversational Skills:** Students will learn to improve their conversational skills by mastering the use of quantifiers such as '个,' '位,' and '双' to accurately express the quantity of tableware items and guests. For example, they will be able to answer questions such as 几个勺子? (How many spoons?) with 八个勺子。 (Eight spoons) and 几位客人? (How many guests?) with 三位客人。 (Three guests).
- **Learning Chinese Culture:** Students will learn about the basic cultural norms regarding Chinese dining etiquette.

Content	
Stage	Activities
Warm-up	<ul style="list-style-type: none"> ✓ Greetings and attendance: Start the class with a friendly greeting and quickly mark the attendance. ✓ Group discussion: Conduct an interactive group discussion to explore and compare the differences between Chinese and Thai food and dining customs. ✓ Whiteboard Vocabulary: Write down the Chinese names of different tableware on the whiteboard to prepare for learning Chinese vocabulary.
Instruction	<ul style="list-style-type: none"> ✓ Quizlet Flashcards Presentation: Use Quizlet to display a variety of different tableware on the whiteboard, showing Chinese characters, pinyin, pictures, and English translations. Such as 客人 guests, cups, 盘子 plates, 筷子 chopsticks, 勺子 spoons and 叉子 forks. ✓ Improving language skills: Teachers use the images on Quizlet flashcards to demonstrate the usage scenarios and cultural connotations of words, helping students improve their language skills through word-building and sentence-building activities. ✓ Conversation exercises: Students will become familiar with the rules for using different quantifiers (e.g. 个、双、位) and apply them accurately in specific contexts. For example A: 几个勺子? B: 八个勺子。 A: 几位客人? B: 三位客人。

Content	
Stage	Activities
Learning Activities	<ul style="list-style-type: none"> ✓ Quizlet Test Mode: Students use Quizlet's "Test Mode" to review and assess their understanding of tableware vocabulary. ✓ Role-play: Students work in pairs and engage in a situational dialogue. One student plays the role of a waiter and the other plays the role of a guest. The waiter asks the guest what cutlery they need, and the guest needs to order the cutlery using the correct vocabulary and measure words. ✓ Pinyin Writing Exercise: Students complete written tasks in their textbooks and exercise books to practice the pinyin for the names of different tableware vocabulary, like 勺子 (sháo zi) 叉子 (chā zi).
Summary	<ul style="list-style-type: none"> ✓ Quick Review: Review key Chinese vocabulary and sentences learned today. ✓ Answer Questions: Answer any questions students may have to clarify understanding. ✓ Homework Assignment: Assign the task of reviewing the lesson material on Quizlet. https://quizlet.com/857047963/p5-lesson4餐具-flash-cards/?funnelUUID=965cbaff-c839-452f-bfc5-be7bfc0fb085

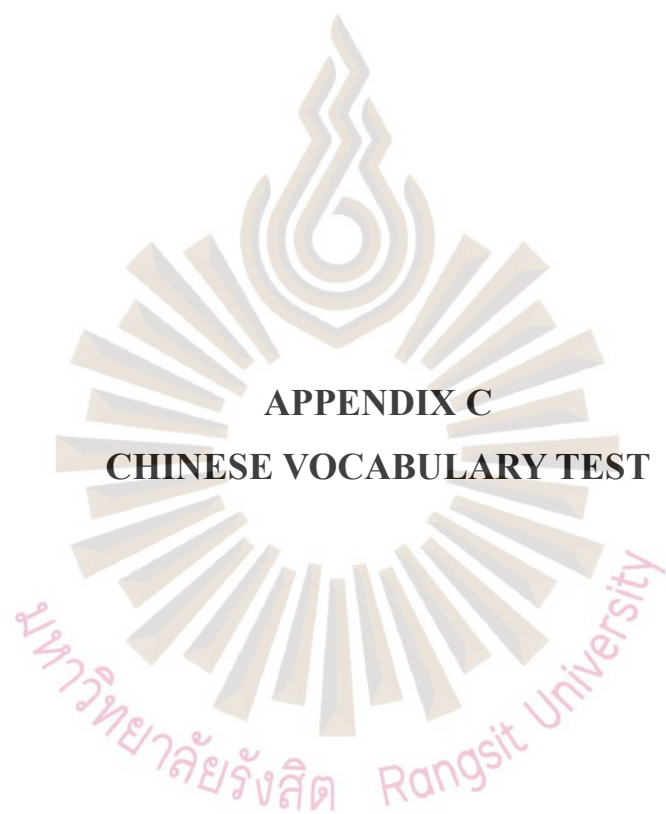


APPENDIX B

IOC OF LESSON PLAN

Item No	Attributes	Expert 1	Expert 2	Expert 3	Average	Congruence
1	Lesson plan 1	+1	+1	+1	+1	Congruence
2	Lesson plan 2	+1	+1	+1	+1	Congruence
3	Lesson plan 3	+1	+1	+1	+1	Congruence
4	Lesson plan 4	+1	+1	+1	+1	Congruence





APPENDIX C

CHINESE VOCABULARY TEST

Chinese Vocabulary Test

Subject: Chinese

Total score: 50 Marks

Student Name:

Part 1 – Listening 听力

Section A: Listening and Identification 仔细听，在正确的答案下打勾。

Directions: Listen carefully to the teacher and then put a tick (√) in the brackets provided under the correct picture. (5x2marks)

1.   
- () () ()
2.   
- () () ()
3.   
- () () ()
4.   
- () () ()
5.   
- () () ()

Part2 – Reading Comprehension 阅读理解

Section A : Matching 连线 (5x2marks)

Directions: Match the words and the pictures below by drawing lines

6.		●		●	家
7.		●		●	吃饭
8.		●		●	那里
9.		●		●	杯子
10.		●		●	盘子

Section B : Multiple Choice 单项选择题 (5x2marks)

Directions: Please choose the correct pinyin for the following words.

11. 泰国.....()

A. hán guó

B. tài guó

C. fà guó

D. yīng guó

12. 哪里()

- A. nǎ lǐ B. zhè lǐ C. nà lǐ D. shén me

13. 杯子()

- A. kuài zi B. sháo zi C. bēi zi D. chā zi

14. 睡觉()

- A. shàng wǎng B. shuì jiào C. kàn bào D. chī fàn

15. 吃饭()

- A. shàng wǎng B. shuì jiào C. kàn bào D. chī fàn

Section C : Multiple Choice 单项选择题 (5x2marks)

Directions: Please choose the correct English meaning for the following words

16. 超市()

- A. station B. Supermarket C. park D. home

17. 看报()

- A. wash clothes B. sleep C. eat D. read newspaper

18. 筷子()

- A. forks B. chopsticks C. spoons D. plates

19. 美国()

- A. China B. France C. England D. USA

20. 公园()

- A. phone B. convenience store C. people D. park

Part3 –Oral Test 口语测试

Directions: Please answer the following two questions (2x5marks)

1. 你是哪国人?
2. 你有哪些日常活动?



Answer Key

Part 1

1. 泰国 2.日本 3.公园 4.睡觉 5.吃饭

Part 2

Section A :

6.盘子 7.杯子 8.家 9.吃饭 10.那里

Section B :

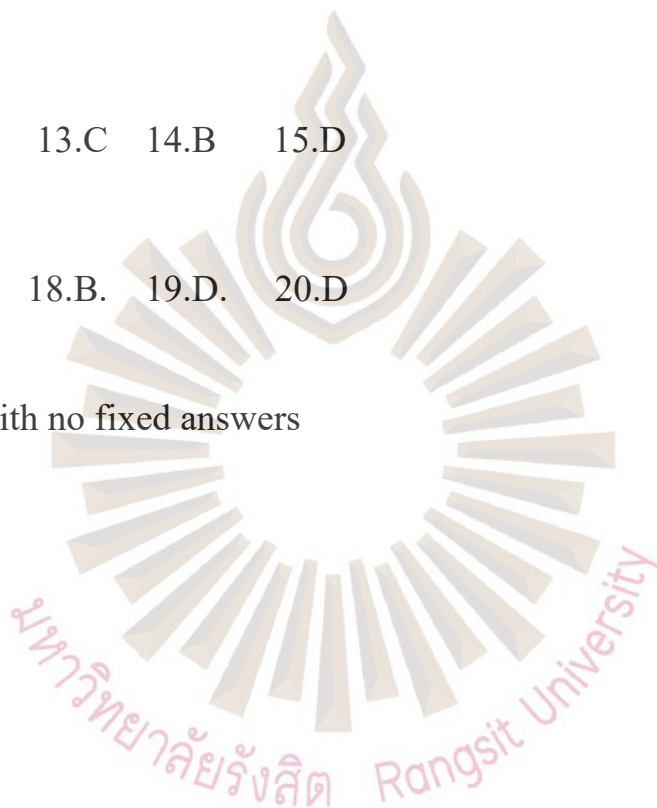
11.B 12.A 13.C 14.B 15.D

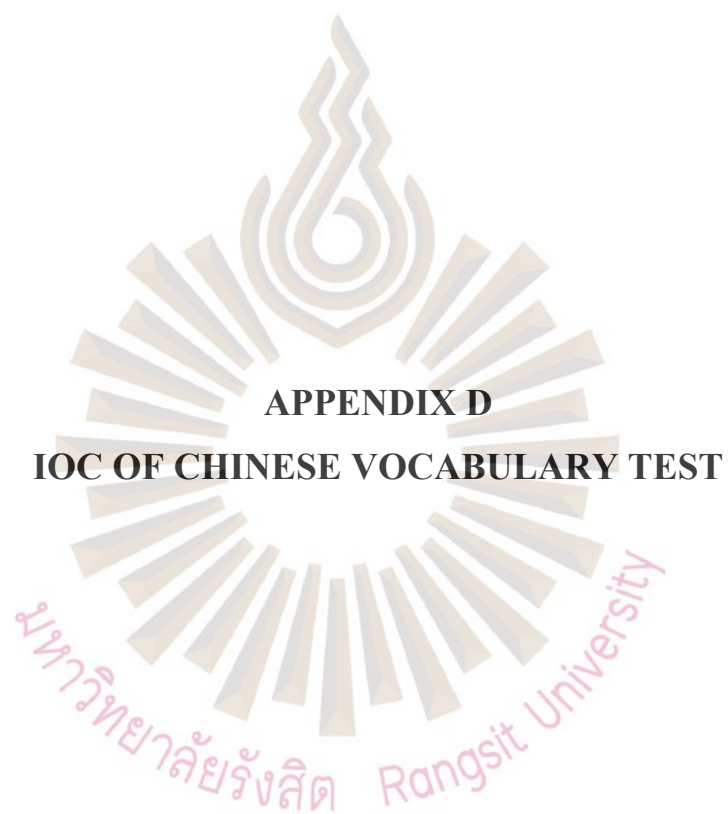
Section C :

16.B. 17.D 18.B. 19.D. 20.D

Part 3

Oral test with no fixed answers





Sl No.	Item Test No.	Expert 1	Expert 2	Expert 3	Average	Congruence
1	Listening Question1	+1	+1	+1	+1	Congruence
2	Listening Question 2	+1	+1	+1	+1	Congruence
3	Listening Question 3	+1	+1	+1	+1	Congruence
4	Listening Question 4	+1	+1	+1	+1	Congruence
5	Listening Question 5	+1	+1	+1	+1	Congruence
6	Reading Comprehension	+1	+1	+1	+1	Congruence
7	Reading Comprehension	+1	+1	+1	+1	Congruence
8	Reading Comprehension	+1	+1	+1	+1	Congruence
9	Reading Comprehension	+1	+1	+1	+1	Congruence
10	Reading Comprehension	+1	+1	+1	+1	Congruence
11	Reading Comprehension	+1	+1	+1	+1	Congruence
12	Reading Comprehension	+1	+1	+1	+1	Congruence
13	Reading Comprehension Question 13	+1	+1	+1	+1	Congruence
14	Reading Comprehension Question 14	+1	+1	+1	+1	Congruence

Sl No.	Item Test No.	Expert 1	Expert 2	Expert 3	Average	Congruence
15	Reading Comprehension Question 15	+1	+1	+1	+1	Congruence
16	Reading Comprehension Question 16	+1	+1	+1	+1	Congruence
17	Reading Comprehension Question 17	+1	+1	+1	+1	Congruence
18	Reading Comprehension Question 18	+1	+1	+1	+1	Congruence
19	Reading Comprehension Question 19	+1	+1	+1	+1	Congruence
20	Reading Comprehension Question 20	+1	+1	+1	+1	Congruence
21	Oral Test Question 1	+1	+1	+1	+1	Congruence
22	Oral Test Question 2	+1	+1	+1	+1	Congruence



APPENDIX E

STUDENTS' SATISFACTION QUESTIONNAIRE

Students' satisfaction Questionnaire

The students' satisfaction questionnaire will be distributed to Grade 5 students who will be the sample group for this study. The purpose of the students' satisfaction questionnaire is to investigate students' contentment with the use of Quizlet in Chinese vocabulary learning. The students' satisfaction questionnaire completed by the participants will be kept confidential and used only for this study.

Mark your level of opinion from 1-5 (strongly agree to strongly disagree) against each statement. The description of each scale 1-5 is as shown in the table below.

Scale:						
Strongly Agree (5) Agree (4) Neutral (3) Disagree (2) Strongly Disagree (1)						
No.	Items	5	4	3	2	1
PART A: INTEREST & MOTIVATION						
1	Using Quizlet increases my interest in learning Chinese vocabulary.					
2	Using Quizlet improves my motivation to learn Chinese vocabulary.					
3	Using Quizlet helps me to build confidence in learning Chinese vocabulary.					
4	Using Quizlet increases my enthusiasm for learning Chinese vocabulary.					
5	Using Quizlet makes the learning process more meaningful.					
PART B: ENGAGEMENT						
6	Using Quizlet enhances my engagement in learning Chinese vocabulary.					
7	Quizlet's flashcards and games keep my learning highly engaging and interesting					
8	Using Quizlet deeply engages me in the process of learning Chinese vocabulary					

Scale:						
Strongly Agree (5) Agree (4) Neutral (3) Disagree (2) Strongly Disagree (1)						
No.	Items	5	4	3	2	1
9	Interacting with Quizlet enhances my overall experience of learning Chinese vocabulary					
10	Quizlet's various learning tools increase my willingness to participate in all learning activities					
PART C: The Effectiveness of Quizlet						
11	Using Quizlet helps me to practice the pronunciation of Chinese vocabulary.					
12	Using Quizlet helps me understand the meaning of Chinese vocabulary.					
13	Using Quizlet improves my memory of Chinese vocabulary.					
14	Using Quizlet helps me to improve my ability to apply Chinese vocabulary.					
15	Using the learning tools on Quizlet to help me learn Chinese vocabulary more efficiently.					



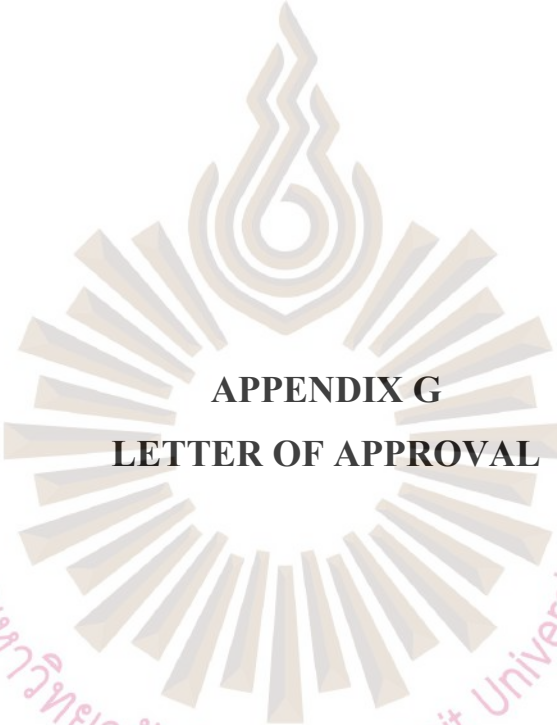
APPENDIX F

IOC OF STUDENT'S SATISFACTION QUESTIONNAIRE

IOC OF QUESTIONNAIRE						
S1N.	Items	Expert1	Expert2	Expert3	Average	Congruence
PART A: INTEREST & MOTIVATION						
1.	Using Quizlet increases my interest in learning Chinese vocabulary.	+1	+1	+1	+1	Congruence
2.	Using Quizlet improves my motivation to learn Chinese vocabulary.	+1	+1	+1	+1	Congruence
3.	Using Quizlet helps me to build confidence in learning Chinese vocabulary.	+1	+1	+1	+1	Congruence
4.	Using Quizlet increases my enthusiasm for learning Chinese vocabulary.	+1	+1	+1	+1	Congruence
5.	Using Quizlet makes the learning process more meaningful.	+1	+1	+1	+1	Congruence
PART B: ENGAGEMENT						
6.	Using Quizlet enhances my engagement in learning Chinese vocabulary.	+1	+1	+1	+1	Congruence

IOC OF QUESTIONNAIRE						
S1N.	Items	Expert1	Expert2	Expert3	Average	Congruence
7.	Quizlet's flashcards and games keep my learning highly engaging and interesting	+1	+1	+1	+1	Congruence
8.	Using Quizlet deeply engages me in the process of learning Chinese vocabulary	+1	+1	+1	+1	Congruence
9.	Interacting with Quizlet enhances my overall experience of learning Chinese vocabulary	+1	+1	+1	+1	Congruence
10.	Quizlet's various learning tools increase my willingness to participate in all learning activities	+1	+1	+1	+1	Congruence
PART C: The Effectiveness of Quizlet						
11.	Using Quizlet helps me to practice the pronunciation of Chinese vocabulary.	+1	+1	+1	+1	Congruence
12.	Using Quizlet helps me understand the meaning of Chinese vocabulary.	+1	+1	+1	+1	Congruence

IOC OF QUESTIONNAIRE						
S1N.	Items	Expert1	Expert2	Expert3	Average	Congruence
13.	Using Quizlet improves my memory of Chinese vocabulary.	+1	+1	+1	+1	Congruence
14.	Using Quizlet helps me to improve my ability to apply Chinese vocabulary.	+1	+1	+1	+1	Congruence
15.	Using the learning tools on Quizlet to help me learn Chinese vocabulary more efficiently.	+1	+1	+1	+1	Congruence

The logo of Rangsit University, featuring a stylized flame or sunburst design in the center, surrounded by a circular arrangement of radiating lines. The text "มหาวิทยาลัยรังสิต" and "Rangsit University" is written in a semi-circle below the logo.

APPENDIX G
LETTER OF APPROVAL

มหาวิทยาลัยรังสิต Rangsit University



COA. No. RSUERB2024-023

**Certificate of Approval
By
Ethics Review Board of Rangsit University**

COA. No.	COA. No. RSUERB2024-023
Protocol Title	THE DEVELOPMENT OF CHINESE VOCABULARY LEARNING USING THE APPLICATION OF QUIZLET FOR GRADE 5 STUDENTS IN THAILAND
Principle Investigator	FAN ANNA
Co-Investigator	Techameth Pianchana
Affiliation	Suryadhep Teachers College, Rangsit University
How to review	Expedited Review
Approval includes	1. Project proposal 2. Information sheet 3. Informed consent form 4. Data collection form Program or Activity plan
Date of Approval:	2 February 2024
Date of Expiration:	2 February 2026

The prior mentioned documents have been reviewed and approved by Ethics Review Board of Rangsit University based Declaration of Helsinki, The Belmont Report, CIOMS Guideline and International Conference on Harmonization in Good Clinical Practice or ICH-GCP

Signature.....

(Associate Professor Dr. Panah Kanchanaphum)

Chairman, Ethics Review Board for Human Research



Praphamontree II School

Soi Paolo Hospital, Bang Muang, Mueang Samut Prakan District, Samut Prakan 10270 Tel.: 023882222

Subject: Approval of Data Collection for M.Ed. Thesis

Dear Sir/Madam,
I am currently enrolled in the Master in Curriculum and Instruction at Rangsit University, Thailand.

I am conducting a research on the " THE DEVELOPMENT OF CHINESE VOCABULARY LEARNING USING THE APPLICATION OF QUIZLET FOR GRADE 5 STUDENTS IN THAILAND " This research requires student participation. The instruments involved during the study pretest and posttest, student satisfaction questionnaire for obtaining the required data. Therefore, I would like to seek permission from the administration to allow me to collect data at this school where the names and identities of the students will be kept confidential and undisclosed.

Yours Sincerely,

Fan Anna,

Rangsit University Thailand

Since the study requires data for analysis purposes, Fan Anna would collecting data from this school and you are kindly requested so allow her to collect data with the following conditions:

Providing research participants with information to make an informed decision as to whether to take part in research (informed consent).

Follow the the prior mentioned document have been reviewed and approved by the administration of Praphamontree II School.

Signature 

Date Jan 31, 2024

Head of Chinese Department

Praphamontree II School

Signature 

Date Jan 31, 2024

School Director

Praphamontree II School



APPENDIX H

EXPERTS WHO VALIDATED RESEARCH INSTRUMENTS

มหาวิทยาลัยรังสิต Rangsit University

	Name	Position/Title	Institutes
1	Ma Jin	Chinese Teacher	Assumption University, Thailand
2	Yang Xiao Man	University Lecturer	Kasetsart University, Thailand
3	Chien Yihsin	Primary Chinese Department Leader	Chung Yuan Christian University, Taiwan





APPENDIX I

RELIABILITY TEST RESULTS OF QUESTIONNAIRE

Sample size	Crobach's Alpha	N of Items
26	0.954	15



The logo of Rangsit University is a circular emblem. At the top is a stylized flame or sunburst. Below it is a central circle with a flame-like shape inside. The bottom half of the circle is composed of many radiating lines of varying lengths, creating a sunburst effect. The text 'มหาวิทยาลัยรังสิต Rangsit University' is written in a semi-circle at the bottom of the emblem.

APPENDIX J
KR-20 ANALYSIS FOR CHINESE VOCABULARY TEST

มหาวิทยาลัยรังสิต Rangsit University

KR-20 analysis for Chinese Vocabulary Test

Students' score

No.	Listening										Reading								Speaking		Total		
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20		Q21	Q22
1	2	2	2	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2	2	5	3	43
2	2	2	2	2	2	2	2	0	2	2	0	0	0	2	0	2	2	0	2	2	3	4	31
3	2	2	2	2	0	2	0	2	0	0	2	0	2	2	2	0	0	2	0	0	4	3	26
4	0	2	0	0	2	2	2	2	2	2	2	2	0	2	0	2	2	2	2	2	3	3	33
5	2	2	2	2	0	2	0	2	2	2	2	2	2	2	2	0	0	2	2	2	4	3	36
6	0	2	0	2	2	2	2	0	0	2	0	2	2	2	2	2	2	0	0	0	5	1	29
7	2	2	2	0	2	2	2	2	2	2	2	0	2	0	0	2	2	2	2	2	3	3	35
8	2	0	2	2	2	2	2	2	2	2	2	2	0	2	2	2	2	2	0	2	2	3	36
9	2	2	2	0	2	0	2	2	2	0	0	2	0	2	2	0	2	2	2	0	3	2	29
10	0	2	2	0	2	2	0	2	0	2	2	2	0	0	0	2	0	2	0	2	4	3	26
11	2	0	2	2	2	0	2	2	2	2	2	0	2	2	2	0	2	2	2	2	3	2	35
12	2	2	2	2	2	2	0	0	0	2	2	2	2	0	2	2	0	0	0	2	2	2	28
13	2	2	0	2	0	2	2	2	2	0	0	2	0	2	0	0	2	2	2	2	2	1	28
14	2	0	0	0	2	2	2	2	2	2	2	0	2	0	2	2	2	2	0	2	1	3	29
15	2	2	0	2	0	2	2	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	34
16	2	0	2	0	2	0	2	2	2	2	2	0	2	0	2	0	2	2	2	2	1	2	29
17	2	2	0	2	2	2	2	0	2	0	0	2	0	2	2	2	2	0	2	0	3	3	29
18	2	0	2	2	0	0	0	2	2	2	2	2	0	2	0	0	0	0	2	0	2	2	22
19	0	2	0	0	2	2	2	2	0	0	2	2	0	2	2	2	2	2	2	2	4	2	32
20	2	2	2	2	2	2	2	0	2	2	2	2	2	0	2	2	0	0	0	2	5	3	35
21	2	0	2	2	0	0	0	2	0	0	2	2	2	2	0	0	2	2	2	0	5	3	27
22	2	2	0	0	2	2	2	2	2	2	2	2	0	0	2	2	0	2	0	2	3	2	31
23	0	0	2	2	0	2	2	0	2	0	2	2	2	2	2	2	0	2	0	4	2	30	
24	0	2	0	2	0	2	0	2	2	2	2	2	0	2	0	0	2	2	2	2	3	28	
25	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2	4	38
26	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2	0	2	2	2	2	1	5	37

After calculation, the mean value and total variance are obtained.

$$\text{Mean } (\bar{X}) = 31.38$$

$$\text{Variance total} = 20.46$$

For Item1:

Number of students who answered Item1 correctly = 19

Proportion of students who answered Item1 correctly = $19/26 = 0.73$

For Item2:

Number of students who answered Item2 correctly = 19

Proportion of students who answered Item2 correctly = $19/26 = 0.73$

For Item3:

Number of students who answered Item3 correctly = 17

Proportion of students who answered Item3 correctly = $17 / 26 = 0.65$

For Item4:

Number of students who answered Item4 correctly = 18

Proportion of students who answered Item4 correctly = $18 / 26 = 0.69$

For Item5:

Number of students who answered Item5 correctly = 18

Proportion of students who answered Item5 correctly = $18 / 26 = 0.69$

For Item6:

Number of students who answered Item6 correctly = 21

Proportion of students who answered Item6 correctly = $21 / 26 = 0.81$

For Item7:

Number of students who answered Item7 correctly = 18

Proportion of students who answered Item7 correctly = $18 / 26 = 0.69$

For Item8:

Number of students who answered Item8 correctly = 20

Proportion of students who answered Item8 correctly = $20 / 26 = 0.77$

For Item9:

Number of students who answered Item9 correctly = 20

Proportion of students who answered Item9 correctly = $20 / 26 = 0.77$

For Item10:

Number of students who answered Item10 correctly = 19

Proportion of students who answered Item10 correctly = $19 / 26 = 0.73$

For Item11:

Number of students who answered Item11 correctly = 19

Proportion of students who answered Item11 correctly = $19 / 26 = 0.73$

For Item12:

Number of students who answered Item12 correctly = 19

Proportion of students who answered Item12 correctly = $19 / 26 = 0.73$

For Item13:

Number of students who answered Item13 correctly = 16

Proportion of students who answered Item13 correctly = $16 / 26 = 0.62$

For Item14:

Number of students who answered Item14 correctly = 18

Proportion of students who answered Item14 correctly = $18 / 26 = 0.69$

For Item15:

Number of students who answered Item15 correctly = 17

Proportion of students who answered Item15 correctly = $17 / 26 = 0.65$

For Item16:

Number of students who answered Item16 correctly = 16

Proportion of students who answered Item16 correctly = $16 / 26 = 0.62$

For Item17:

Number of students who answered Item17 correctly = 19

Proportion of students who answered Item17 correctly = $19 / 26 = 0.73$

For Item18:

Number of students who answered Item18 correctly = 20

Proportion of students who answered Item18 correctly = $20 / 26 = 0.77$

For Item19:

Number of students who answered Item19 correctly = 17

Proportion of students who answered Item19 correctly = $17 / 26 = 0.65$

For Item20:

Number of students who answered Item20 correctly = 19

Proportion of students who answered Item20 correctly = $19 / 26 = 0.73$

For Item21:

Number of students who answered Item21 correctly = 16

Proportion of students who answered Item21 correctly = $16 / 26 = 0.62$

For Item22:

Number of students who answered Item22 correctly = 15

Proportion of students who answered Item22 correctly = $15 / 26 = 0.58$

Note: In China, meeting the passing grade requirement entails achieving a score higher than 60% of the total marks. Due to item 21 and 22 being speaking part, in these items, students who scored above 60% (3 points) of the total marks were

marked as correct, while those who scored below 60% (3 points) were marked as incorrect.

The KR-20 formula is as follows:

$$KR - 20 = \frac{K}{K-1} \left(1 - \frac{\sum p_i(1-p_i)}{\sigma_i^2} \right)$$

Given the proportion correct for each item p_i , we will compute the sum of $p_i(1-p_i)$.

$$\begin{aligned} \sum p_i(1-p_i) &= (0.73 \times 0.27) + (0.73 \times 0.27) + (0.65 \times 0.35) + \dots + (0.58 \times 0.42) \\ &= 0.1979 + 0.1979 + 0.2275 + \dots + 0.2424 \end{aligned}$$

$$\sum p_i(1-p_i) = 4.55$$

Next, we use the given total variance (20.46) to calculate KR-20:

$$\begin{aligned} KR - 20 &= \frac{22}{22-1} \left(1 - \frac{4.55}{20.46} \right) \\ &= \frac{22}{21} \left(1 - \frac{4.55}{20.46} \right) \\ &= 1.0476 \times \left(1 - \frac{4.55}{20.46} \right) \\ &= 1.0476 \times 0.7789 \\ KR - 20 &\approx 0.8159 \end{aligned}$$

To assess the reliability of the test, KR-20 was calculated based on the provided data. The total variance across all items was found to be 20.46, and the sum of $p_i(1-p_i)$ was calculated to be 4.55. Utilizing the formula for KR-20, which incorporates the number of items in the test (22), the coefficient was computed to be approximately 0.8159. This indicates the internal consistency reliability for the Chinese vocabulary test is acceptable.

BIOGRAPHY

Name	Anna Fan
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