THE DEVELOPMENT OF CHINESE LEARNING ACHIEVEMENT BY LEARNING MANAGEMENT THROUGH GAME-BASED LEARNING FOR PRIMARY 5 (GRADE 5) STUDENTS

SIJIA SHEN

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION
PROGRAM IN CURRICULUM AND LEARNING
MANAGEMENT INNOVATION
FACULTY OF TECHNICAL EDUCATION
RAJAMANGALA UNIVERSITY OF TECHNOLOGY THANYABURI
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Thesis Title	The Development of Chinese Learning Achievement by Learning Management through Game-Based Learning for Primary 5 (Grade 5) Students
Name – Surname	Miss. Sijia Shen
Program	Curriculum and Learning Management Innovation
Thesis Advisor	Assistant Professor Rossarin Jermtaisong, Ph.D.
Academic Year	2024

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ABSTRACT

The purposes of this study were to: 1) compare Chinese learning achievement before and after learning management through a traditional approach for Primary 5 (Grade 5) students, 2) compare Chinese learning achievement before and after learning management through game-based learning and 3) compare Chinese learning achievement by learning management through a traditional approach and game-based learning.

The research samples were 60 of the Primary 5 (Grade 5) students, in a Buriram Primary School, Thailand in the 2024 academic year, selected by random cluster sampling. The research instruments were: 1) the learning management plans through a traditional approach; 2) the learning management plans through game-based learning; and 3) a Chinese learning achievement test. The data analysis statistics were mean, standard deviation, and samples t-test.

The research results showed that: 1) Chinese learning achievement by learning management through a traditional approach was higher than before at the statistical significance level of .05., 2) Chinese learning achievement by learning management through game-based learning was higher than before at the statistical significance level of .05. and 3) the Chinese learning achievement of those studying by learning management through game-based learning was higher than those studying through a traditional approach at the statistical significance level of .05.

Keywords: traditional approach, game-based learning, Chinese learning achievement

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CHAPTER 1
INTRODUCTION

1.1 Background and Statement of the Problems

Since the implementation of reforms and the policy of opening, China's economic strength has steadily increased, and its international stature has been enhanced. This development sparked widespread interest in China, resulting in a growing number of people wanting to learn the Chinese language. On January 25, 2021, the United Nations World Tourism Organization (UNWTO) made a formal announcement declaring Chinese as the official language of the UNWTO (China Tourism News, 2021, p.1). Subsequently, a new trend of enthusiasm for learning Chinese swept across the globe.

The Universal Declaration on Cultural Diversity by UNESCO (2001) stated, 'Cultural diversity served as a wellspring of interchange, innovation, and imagination, just as vital to humanity as biodiversity was to the preservation of ecological equilibrium.' Cultural diversity stood as the shared legacy of humankind, forming the bedrock of human societal advancement and acting as a wellspring of cultural ingenuity and progress. As Zhang Xiaogang (2005, p.1) articulated, 'The acceleration of economic globalization underscored the necessity for increased attention to and advocacy for cultural diversity.' Language served as the established conduit of communication.

Among the numerous languages spoken worldwide, Chinese had the largest population of native speakers. Propelled by geopolitical and economic motivations, Southeast Asian nations, with their distinctive ties to China, had progressively adjusted their policies concerning overseas Chinese communities. They implemented a series of measures aimed at fostering and popularizing Chinese education. Over recent years, the advancement of Chinese language acquisition in Thailand has been gradual yet pronounced. This progress has led to heightened demands for effective Chinese language instruction, with teaching methodologies taking center stage in pedagogical research (Xu C. J., 2013, p.1).

Thailand has established Chinese enrichment courses for elementary school students. The objective was to enhance cultural and educational exchanges between the two nations and pave the way for learners' future development. Fostering students' interest

in the Chinese language and establishing a solid foundation have been considered imperative teaching goals (Yin Y., 2023, p.12). The prevailing situation concerning Chinese instruction had been that, in the majority of schools, Chinese remained an elective subject. To captivate students' attention and nurture their enthusiasm for Chinese, the incorporation of engaging classroom activities and games emerged as an essential instructional component (Yang J., 2019, p.66).

According to the Investigation and Research on the Chinese Learning Status of Primary School Students, there was no apparent disparity in the learning aptitude of elementary school students when it came to acquiring Chinese language skills (Zheng X., 2017, p.50). As famously articulated by Einstein: 'The art of teaching was the art of awakening the natural curiosity of young minds to satisfy it afterward' (Einstein A., 1934, p.25). Scholars argued that by thoroughly stimulating students' interest throughout the learning process, a positive developmental trajectory could be established, ultimately leading to favorable learning outcomes.

Game-based learning involves integrating games into Chinese instruction. The German philosopher Lazarus (19th century) once proposed that games and entertainment could help people alleviate physical and psychological fatigue caused by strenuous work. He believed that engaging in games and entertainment activities offered a way to eliminate weariness and provide relief. Patrick Zarus (20th century) expanded upon and developed Lazarus's theory, asserting that the concept of play originated from the human need for relaxation. Games and others activities offered an avenue for people to temporarily escape the exhaustion of demanding work. This notion suggested that game activities stemmed from 'racial preferences and racial memories.' Game-based learning sought to empower educators to facilitate instruction through engaging games, enabling students to depart from traditional, monotonous teaching methods. This approach aimed to foster a more relaxed and unconstrained learning environment, stimulating students' enthusiasm for active engagement and exploration. (Wen J., 2022, p.6). Li Qingsong and Xiao Yan (as cited in Wang Lianhui, 2011) pointed out in their work Game Teaching and Its Experiment that the efficacy of game teaching extended beyond facilitating students' easy, enjoyable, and effective grasp of knowledge. It had also been evident in the enhancement of students' self-control abilities, organizational skills, and positive

emotional qualities. Both game-based learning and game-based methods served as effective strategies for cultivating such skills (Liu Z., 2020, p.1).

The implementation of game-based learning enlivened the classroom atmosphere, heightened students' enthusiasm for learning, improved their attentiveness during class, reinforced memory retention, and elevated the overall teaching quality (Zhang H., 2023, p.70). This approach diversified teachers' classroom instruction techniques, stimulated learners' curiosity for learning, and enhanced their learning outcomes, yielding a positive impact (Yin Y., 2022, p.13).

Recognizing the significance of language learning management, the researcher developed and studied the effectiveness of educational games for the Chinese language. The researcher also compared students' learning achievement in Chinese after using the traditional approach with their achievement after using the game-based learning approach. The researcher envisioned that students would improve Chinese learning achievement in the Chinese language subject while deriving enjoyment and satisfaction from the learning process. Additionally, this perspective guided teachers in enhancing and designing learning management through game-based learning, not only for Chinese language content but also for other subjects, to achieve heightened effectiveness in learning achievement.

1.2 Research Questions

1.2.1 Was there a significant difference in the Chinese learning achievement before and after learning management through a traditional approach for Primary 5 (Grade 5) students?

1.2.2 Was there a significant difference in the Chinese learning achievement before and after learning management through game-based learning for Primary 5 (Grade 5) students?

1.2.3 Was there a significant difference in Chinese learning achievement by learning management through a traditional approach and game-based learning for Primary 5 (Grade 5) students?

1.3 Purpose of the Study

1.3.1 To compare Chinese learning achievement before and after learning management through a traditional approach for Primary 5 (Grade 5) students.

1.3.2 To compare Chinese learning achievement before and after learning management through game-based learning for Primary 5 (Grade 5) students.

1.3.3 To compare Chinese learning achievement by learning management through a traditional approach and game-based learning for Primary 5 (Grade 5) students.

1.4 Research Hypothesis

The researcher will test the following hypothesis at a .05 level of significance:

1.4.1 The Chinese learning achievement of primary 5 (Grade 5) students after learning management through the traditional approach was higher than before.

1.4.2 The Chinese learning achievement of primary 5 (Grade 5) students after learning management through game-based learning was higher than before.

1.4.3 The Chinese learning achievement of primary 5 (Grade 5) students after learning management through game-based learning was higher than learning management through the traditional approach.

1.5 Scopes of the Study

1.5.1 Population and Sample

1.5.1.1 This study's population comprised 221 Primary 5 (Grade 5) students and was distributed among 5 classrooms in Thailand, in the 2024 academic year.

1.5.1.2 The sample for this study consisted of 60 Primary 5 (Grade 5) students from two classrooms, selected through cluster random sampling. One class (30 students) was chosen as the experimental group, where students received instruction through game-based learning management, while the other class (30 students) was chosen as the control group, where students received instruction through the traditional approach.

1.5.2 Variables

1.5.2.1 The independent variables in this research comprised two methods: 1) the traditional approach and 2) game-based learning in the Chinese language course.

1.5.2.2 The dependent variable in this research was the achievement of the Chinese language course.

1.5.3 Scope of Contents

The Chinese language course for primary 5 (Grade 5) students in the Learning Areas: Foreign Languages, covered Unit 1: Language for Communication, which included two sub-learning units:

Sub-learning Unit 1: Words used in the classroom, titled "Hometown."

Sub-learning Unit 2: Speaking, introducing yourself and people close to you, titled "I'm from Beijing."

1.5.4 Scope of Time

The research period of the project is from October 2023 to September 2024.

1.6 Definition of Terms

For ease of understanding, the following terms were hereby defined conceptually and or operationally:

1.6.1 Game-based learning involved integrating game elements into teaching to make it more attractive and interactive, thereby increasing students' interest in learning, completing classroom content more efficiently, and improving academic performance. The game-based learning process could be roughly divided into the following steps:

Step 1 Teaching Preparation: Preparations were made before teaching, including determining the scope of instruction, clarifying learning objectives based on the content, and understanding the characteristics of students in advance.

Step 2 Teaching: Different content was chosen for diversified game preparations, and game tools were prepared in advance.

Step 3 Game Demo: Individual differences among students were considered, and the idea of teaching students according to their aptitude was adopted. Games were adjusted and innovated as needed to maximize their effectiveness.

Step 4 Game Development: The rules of classroom games were explained and demonstrated to ensure that students could fully understand and engage with them while observing students' adaptability and reactions.

Step 5 Summary and Evaluation: Teaching results were tested and summarized, with continuous improvements made based on the evaluations. Teaching Preparation: Preparations were made before teaching, including determining the scope of instruction, clarifying learning objectives based on the content, and understanding the characteristics of students in advance.

1.6.2 The traditional approach primarily involved teachers regularly instructing from textbooks, with the teacher controlling the classroom while students listened. This approach could be roughly divided into the following steps: 1) introduction, 2) teaching, and 3) conclusion.

1.6.3 Chinese learning achievement refers to the outcome of knowledge gained in the Chinese course, which could be measured through tests.

1.6.4 The students were primary 5 (Grade 5) students in a Buriram Primary School, in Thailand.

1.7 Conceptual Framework

Since this research paper will employ an experimental research design, the framework below will serve as the researcher's guide in the conduct of the study:

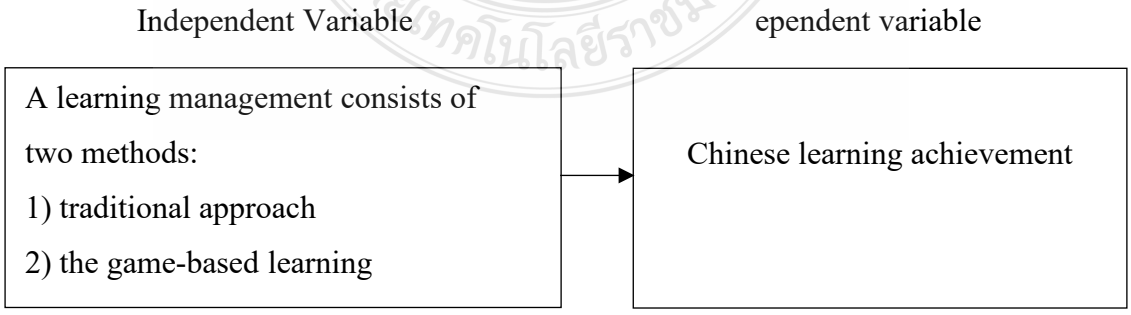

Figure 1.1 Conceptual Research Framework

1.8 Expected Benefits

1.8.1 Students developed Chinese learning achievement in the Chinese course through innovations in learning management via game-based learning.

1.8.2 The innovations in learning management through game-based learning were applied in schools to enhance Chinese learning achievement.

CHAPTER 2
REVIEW OF THE LITERATURE

The researcher studied the research study development of Chinese learning achievement through game-based learning for Primary 5 (Grade 5) Students. This chapter focused on reviewing the previous studies on the following areas relevant to this research.

2.1 Game-Based Learning

2.1.1 Definition of Game-Based Learning

With the development of society, people's thoughts became increasingly modern, and the traditional approach began to have less significant effects on the classroom and students. To enable students to absorb knowledge efficiently, an active classroom atmosphere and interaction between teachers and students became even more important.

Game-based learning refers to the use of games for educational purposes. It involved defining achievement through games as a learning method without imposing

stress or pressure on students, ultimately enhancing their educational levels. This approach facilitated the incorporation of ideas and activities in a stress-free environment, introducing exercises and assessments in engaging ways that encouraged collaborative student participation and fostered effective learning methods (Kanimozhi P., and Jayakumar D., 2015, pp.568–571).

Game-based learning and game-based strategies represented trends that were implemented in various settings, including workplace training, education, and social media. Many individuals have encountered game-based engagement techniques in one form or another, whether consciously aware of it or not (Pho A. and Dinscore A., 2015, p.1).

Game-based learning involves using language game activities to reinforce and enhance students' acquired knowledge. It served as a means to review and extract practiced language skills and apply them effectively in real-life communication scenarios. This approach not only enlivened the classroom atmosphere but also ensured the attainment of instructional objectives, thereby enhancing overall teaching efficacy. (Zhu L., 2008, p.86). The language knowledge acquired through games tended to be more robust because it encompassed elements such as guessing, generalization, imagination, analysis, and imitation. These factors stimulated and reinforced the connections among various variables in students' minds, enhancing memory's ability to trigger knowledge recall and, consequently, promoting structural assimilation (Wang C., 2008, p.56).

Game-based learning was used to carry out teaching activities, and teaching goals were achieved through games (Zhang H., 2023, p.11). Wu Yexian defined game-based teaching as "a teaching activity that closely combines educational and game elements, allowing students to learn more naturally in a relaxed environment with strong interest". It enabled children to learn in a relaxed and cheerful manner. During the game activities and within that atmosphere, students naturally absorbed the knowledge from the textbook and acquired additional extracurricular knowledge that they were expected to know (Wu Y., 1996, p.24).

When teachers transformed the boring language of the classroom into a "situational" teaching method that was lively, interesting, and easy for students to accept, they used a scientifically based approach that cultivated students' comprehensive language application abilities, nurtured their multiple intelligences, and tapped into their

potential. This method followed specific steps according to the teaching content, gradually advancing the English teaching process (Zhang H., 2023, p.12). Game-based learning provided a cooperative and competitive environment, which students enjoyed. They viewed learning as an internal motivation or demand, developed a strong interest in learning, became more willing to participate in learning activities, and were able to consciously complete corresponding learning tasks, continuously advancing the learning process (Yin Y., 2022, p.9).

"Game-based learning" referred to the use of games as the primary method for conducting classroom teaching. In the process of teaching design, appropriate teaching methods were selected based on teaching strategies and the psychological characteristics of learners' age, considering training objectives, development, and evaluation. Strategies, development tools, and evaluation methods were skillfully combined to integrate "teaching" and "games" (Wang J., 2019, p.7).

Zeng J. (2006, p.8) defined games as "all organized language activities in second language or foreign language classroom teaching that enhance interest in learning and consolidate and apply the knowledge of the language learned". Games were integrated into language teaching, allowing students to practice language knowledge through various forms of games in the classroom. This approach fully mobilized students' enthusiasm, enabling them to master and consolidate what they had learned in a relaxed and engaging learning atmosphere (Yan H., 2021, p.11).

In conclusion, game-based learning integrated game elements into teaching to make it more attractive and interactive, thereby increasing students' interest in learning, completing classroom content more efficiently, and improving academic performance. This approach was not only applicable to language teaching.

2.1.2 Steps of Game-Based Learning

In daily classroom learning, teachers needed to plan course materials before class to ensure that students could learn knowledge logically. The same applied to game-based learning. Teachers had to determine the steps for the class in advance.

The term "teaching steps" in the context of classroom instruction referred to dividing a knowledge notion or skill into several structured units or stages that could be learned sequentially during the educational process. These steps helped students

gradually comprehend and master the material they studied, facilitating the achievement of learning objectives. Research has shown that implementing game-based learning often started on a small scale and required considerable time to be implemented correctly. A study conducted by Emin-Martinez and Ney (2013, as cited in Guan X., 2013, p.26) indicated that adopting a new learning approach, such as game-based learning, involved a five-step process: knowledge, persuasion, decision, implementation, and confirmation. Game-based learning was usually divided into these steps for effective implementation.

Step 1 Background introduction: Before implementing game-based teaching, teachers needed to clarify the teaching objectives of the lesson and inform students about the specific course background, game context, game-based learning approach, and game rules.

Step 2 Preparation for teaching: Teaching preparation involved browsing and preparing teaching materials, as well as setting up the teaching environment. During game-based teaching, teachers had to first analyze the content of the courses to be taught, confirm the games to be used, and identify the necessary teaching materials for game implementation before preparing them. It was also essential to prepare the teaching environment before class. For example, before teaching pinyin literacy, teachers organized literacy cards and arranged the blackboards, among other tasks.

Step 3 Student preparation: In game-based teaching, to better reflect students' active participation, teachers usually required students to use their own brains and engage hands-on. Therefore, before teaching, not only did the teacher need to prepare the teaching conditions, but students also had to prepare the props needed for the game.

Step 4 Teaching implementation: After teachers and students were prepared, game-based teaching could begin. During the game implementation, teachers needed to pay close attention to students' actions and actively and flexibly respond to any emergencies that arose. The process required a high level of teaching ability, management skills, and observation. This necessitated that teachers demonstrate calmness, composure, and orderly teaching wisdom throughout the game-based teaching.

Step 5 Summary: Reflection - After the game-based teaching ended, the teacher summarized the class and reflected on the effectiveness of the game.

Wang L. (2011, p.31) believed that whether a game was integrated throughout the entire class or was a part of the teaching process, its development and implementation needed to be completed. It typically included the following parts: pre-class preparation, rule explanation, game demonstration, game development, and game results (teacher's summary and encouragement). The smoothness of the game's execution was directly related to the effectiveness of the teaching. The following details each step in the process.

Step 1 Preparation before class: Pre-class preparation was the foundation for a classroom game to be carried out smoothly. In addition to designing the game beforehand, teachers also made preparations related to the game, including arranging venues, gathering props, and organizing prizes. They paid attention to time allocation and control, among other considerations. Teachers also prepared to handle emergencies by anticipating potential problems and solutions for each stage of the process, ensuring they would not be caught off guard and that the progress of classroom teaching would not be disrupted.

Step 2 Rules explanation: The rules of the game were clearly explained so that the game could proceed as originally intended. If students did not understand or follow the rules, the game could not proceed smoothly. The teacher explained the rules clearly in the shortest possible time, using the most concise language. If explaining a rule required significant effort to ensure students understood, but the actual game was very simple, the game lost its effectiveness, leading to student disappointment. When some rules were difficult to explain, teachers used body movements, facial expressions, or provided examples.

Step 3 Game demo: In classroom games where children were the focus, using visual demonstrations was more effective than explaining the rules. Teachers used body language and facial expressions to complete the demonstration, playing a role in guiding and illustrating the game. During the demonstration, students with relatively high Chinese proficiency were selected to participate in a simple demonstration. At the same time, the teacher paid attention to the students' reactions to ensure they understood the rules.

Step 4 Game Development: The development of games was the central element of classroom games and required the joint efforts of students and teachers to achieve the desired effect. During this process, teachers actively participated, observed each student's performance, identified and recorded problems, and corrected them after the game ended. They provided timely assistance when students encountered difficulties they couldn't express. Since children have short attention spans, it was essential to conclude the game before they lost interest. Teachers managed the classroom atmosphere to ensure that the game remained focused and under control.

Step 5 Game Over: To maintain the long-term effectiveness of games in teaching, the teacher announced the final result at the end of the game and provided a brief summary. For individuals or groups that performed well, both spiritual and material rewards were given. This approach helped students feel that the teacher was serious and trustworthy, while also strengthening their sense of role models, motivating them for future games.

Different instructional steps applied to different curriculum settings, and there were also other steps, such as those described by Yin Y. (2022, pp.34-36):

Step 1 Clarified the theme and content: Due to the spiral nature of the textbook system, the teaching content was presented from simple to complex and from easy to difficult. Therefore, we identified parts of the previous learning content that could be connected with the current lesson and used games to bridge the old and new teaching content before introducing new knowledge. This was the focus of game-based oral English teaching design. Teachers thoroughly explored the teaching materials, extracted elements that could be used to design games, and selected games suitable for those elements. They established a connection between the games and the teaching content rather than separating the games from the instructional material.

Step 2 Analyzed learner characteristics: According to constructivist learning theory, the learning process involved learners generating meaning and constructing understanding based on their existing knowledge and experience. This process was typically completed through social and cultural interaction, emphasizing the learners' initiative. Therefore, after clarifying the teaching content and themes, it was necessary to consider the learners' existing cognitive abilities and levels to determine the

appropriate starting point for teaching. Teachers often created multiple game plans, but not all were suitable for every learner. Consequently, it was essential to analyze the learners' learning situations and characteristics and anticipate potential classroom challenges based on the actual context. For the same teaching goal, the teaching design varied depending on the differences among learners. A teaching game that was effective in a calm and quiet class might lead to excessive activity and disorder in a livelier class. Therefore, only by basing the teaching design on the learners' specific conditions could the best classroom outcomes be achieved.

Step 3 Selected game and designed resources: After clarifying the teaching objectives and analyzing the learners' actual situation, the teacher determined several alternatives and then used relevant resources to design the game, considering the game's adaptability, especially within the language context. The effects of the teaching game were also taken into account. According to Chomsky's theory of language ability, students were exposed to the target language, continuously internalized and produced language, and experienced the process from imitation to learning to creation. Teaching games needed to be highly compatible with the context to provide students with a richer learning experience in the language environment. Therefore, the purpose of selecting games and designing resources was to ensure that these resources supported classroom teaching and context, allowing teaching to proceed smoothly.

Step 4 Determined the game design: The analysis of teaching topics and learners had been the premise of selecting and designing game resources. Following the requirements of the curriculum objectives and creating learning situations for students had been the core of the design. This had been related to whether the game could fit the students' experience and facilitate better learning. The design and use of game resources had been the focal point of game-based oral English teaching design. Teachers had reasonably selected and used existing teaching resources to realize the use of games as a means for learners to unconsciously acquire knowledge in a relaxed and enjoyable setting.

Step 5 Determined the game design: The analysis of teaching topics and learners was the foundation for selecting and designing game resources. Meeting the curriculum objectives and creating effective learning situations for students was at the core of the design. This was crucial for ensuring the game fit the students' experiences

and facilitated better learning. The design and use of game resources were central to game-based oral English teaching design. Teachers carefully selected and utilized existing teaching resources to enable learners to unconsciously acquire knowledge in a relaxed and enjoyable setting through games.

Li Y. (2021, pp.61-69) believed that game-based learning had a significant effect on students' literacy learning. It was considered an interesting and effective method for both learning and teaching. The following steps were implemented, taking into account the actual situation of the students.

Step 1 Understood students' learning situation and clarified literacy teaching goals: Before teaching, teachers fully understood the students' learning situations and determined the starting point of their learning. Primary school students, having just entered the study life of primary school, exhibited high levels of freshness and curiosity about the learning content but struggled to maintain concentration for extended periods. By understanding the students' learning situations, teachers designed games that were more suitable for them. Learning through games not only aided teaching but also helped students learn more effectively. Therefore, before implementing game-based learning, teachers thoroughly grasped the students' academic situation, clarified the teaching content, formulated and refined teaching goals, and selected game-based learning activities appropriate for the students.

Step 2 Carefully designed games to increase the fun of learning: Game-based teaching was not static. If teachers had continued using the same game modes, learning would have become boring. This required teachers to think creatively, design, and innovate in game-based learning, creating engaging games to capture students' attention. For example, teachers developed interesting game titles, created appealing game teaching aids, designed various types of games, and crafted games with moderate difficulty levels, among other strategies.

Step 3 Respected individual differences and improved students' enthusiasm for learning: It was evident that students were influenced by factors such as inherent genetic traits, family environments, social surroundings, and educational backgrounds, leading to individual differences that made each student unique (Wang Y., 2020, pp.112). This required teachers to respect these differences when implementing

game-based learning and to provide opportunities for every student. Understanding the rationale behind these differences was important, and teachers needed to consider the game participation and experiences of each student. Based on students' varying characteristics, teachers had to adopt different game-based learning approaches, provide targeted teaching, and tailor instruction to meet individual needs.

Step 4 Clarified the role of teachers and advocated for placing students at the center: Teachers were the designers, organizers, and guides of game-based learning, rather than merely teaching and instilling information. The "Chinese Language Course Standards" had proposed that teachers creatively understand and use textbooks, design teaching plans carefully, employ various teaching methods skillfully, and guide students to learn through practice (Zhu Z., 2021, p.42). Teachers guided students to develop an awareness of independent gaming and taught them gaming methods. After completing game-based literacy activities, they facilitated self-evaluation so that students could assess their own learning and cultivate positive learning concepts (Wang L., 2007, pp.69-71).

Step 5 Did a good job in evaluation and provided timely teaching feedback: After implementing game-based learning, teachers' self-evaluation and reflection were crucial. For example, they assessed how the game-based learning process had unfolded, whether the teaching objectives had been achieved, and if students' participation and learning completion met the standards. Teachers also gathered valuable insights from others, learned from each other's strengths, and addressed their own weaknesses in teaching progress and growth. Under this evaluation mechanism, teachers' self-evaluation and reflection were more effective and facilitated their professional development more rapidly.

Zhang J. (2021, pp.30-31) believed that the application of game-based learning to primary school Chinese language course included three main parts: preparation before the game, the process of developing the game, and the summary after the game. During the development of the game, the game organizer could adjust the game process and direction based on the difficulty of the learning content and the learners' mastery, aiming to improve the efficiency of game teaching and ensure effective teaching outcomes.

Step 1 A good start is half the battle, so the preparatory work for game teaching was particularly important. In addition to carefully designing the game teaching process, teachers also needed to prepare the materials required for the game, primarily focusing on physical props.

Step 2 In the process of teaching, teachers interspersed small games according to specific literacy links, engaged students' multiple senses, and increased the methods and means of information input.

Step 3 After the game was over, it was necessary to summarize and comment on the game teaching session in a timely and comprehensive manner. Teachers also needed to write teaching reflections promptly.

In conclusion, game-based learning could be roughly summarized in the following way:

Table 2.1 Summary of game-based learning steps.

STEP / NAME	Back ground	Teaching Rreparation	Student Preparation	Teaching	Game Demo	Game Development	Game Over	Summay and Evaluation
Guan X.2013	✓	✓	✓	✓	✓			✓
Wang L. 2011		✓		✓	✓	✓	✓	
Yin Y.2022	✓	✓			✓	✓	✓	✓
Li Y.2021		✓		✓	✓	✓	✓	✓
Zhang J. (2021)		✓		✓	✓			✓

It could be seen from the table that game-based learning was roughly divided into the following five steps:

1) Teaching Preparation: Prepare before teaching by determining the scope, clarifying learning objectives based on the content, and understanding students' characteristics in advance.

2) Teaching: Choose diverse content for game preparations and prepare game tools ahead of time.

3) Game Demo: Understand students' individual differences, adopt a teaching approach that fits their abilities, and adjust and innovate games as needed to maximize effectiveness.

4) Game Development: Explain and demonstrate the rules of the games so that students fully understand and engage, while observing their adaptability and reactions.

5) Summary and Evaluation: Test and summarize teaching results and continuously improve.

2.1.3 Type of Game-Based Learning

Society was diverse, with each person's personality, thoughts, and behaviors differing. Therefore, for game-based learning, diversified game teaching designs were necessary to address different student groups, requiring varied approaches to game-based learning. An educational model could often be divided into various types of refinement.

Learning games have been piloted and used in various contexts and for different purposes. The flexibility of this usage was reflected in the diverse approaches that supported learning. Games had been employed in areas where learning was often experiential, such as professional development, where virtual experiences could reduce real-life costs or address essential learning needs. Notable examples included medical and legal practice, security and defense training, business and management studies, citizenship, and governance. In many of these cases, cross-training- such as between armed and emergency services or between governance and legal trainees- had been valuable not only for refining skills but also for gaining a broader 'worldview' to enhance decision-making and foster more coordinated strategy and policy development (Freitas D., 2006, p.15).

The main types of game-based learning approaches identified seven key approaches implemented in education across all levels and contexts (Konstantinos K. et al., 2020, pp.90-91).

1) Flashcard type games-Memory games, Example game: Duel
2) Simulation Games, Example game: Plantvile
3) Interactives, Example game: Funbrain
4) Quiz games, Example game: Kahoot
5) Puzzles, Example game: Crossword
6) Strategy garners, Example game: Europa Universalis

7) Reality testing games, Example game: Chemistry VR

Introducing games into the classroom marked progress in modern teaching concepts. If games were classified based on student participation, they could be divided into rule-based games, structured games, and imagination games (Yang Q., 2016, pp.19-20).

In his work "Application of Games in Second Language Acquisition and Teaching," Zeng J. (2006, p.6) categorized games as follows:

"Based on the purpose of the game, which refers to the language points to be practiced, they could be divided into vocabulary games, grammar games, phonetic games, Chinese character games, sentence games, cultural games, etc. According to the method of implementation, they could be categorized into intellectual games, knowledge games, physical games, competition games, etc. Depending on the manner of execution, games could be classified as performances (songs and dances, skits), speeches, debates, actions, investigative reports, etc."

According to Bai X. (2021, p.32), practical experience combined with the personality characteristics and number of Korean junior high school students led to the categorization of primary vocabulary teaching games into three types based on different game tools: card games, multimedia games, and physical games. Each category was analyzed and explained in terms of its purpose, required tools, game duration, implementation process, and classroom feedback.

In conclusion, game-based learning could be classified differently depending on the perspective, primarily based on the subject of teaching and the group being taught

2.1.4 Benefits of Game-Based Learning

Most students enjoyed playing their favorite games in their spare time. Researchers believed that integrating games into the classroom could create a relaxed, enjoyable, and engaging atmosphere. This, in turn, made students more interested in the knowledge they were learning and encouraged more active participation.

The most direct purpose of classroom games was to create a more relaxed and pleasant atmosphere. The fundamental goal had been to improve classroom efficiency, help Chinese language course teachers present knowledge more vividly and

freely, and make it easier for students to understand, thereby achieving effective teaching outcomes (Xu C. J., 2013, p.10).

Video games had significant positive potential beyond their entertainment value, and there had been considerable success when games were designed to address specific problems or teach particular skills. Video games clearly attracted the attention of children and adolescents. For over twenty years, researchers have been using games in education, citing the following reasons for their effectiveness as teaching and learning tools (Griffiths M., et al., 2002, p.41):

1) Games could be used as research and/or measurement tools.

2) Games attracted participation from individuals across various demographic boundaries (e.g., age, gender, ethnicity, and educational status).

3) Games could assist children in setting goals, ensuring goal rehearsal, providing feedback and reinforcement, and maintaining records of behavioral change.

4) Games were useful because they allowed researchers to measure performance on a wide variety of tasks and could be easily modified, standardized, and understood.

5) Games were used to examine individual characteristics such as self-esteem, self-concept, goal-setting, and individual differences.

6) Games were fun and stimulating for participants, making it easier to achieve and maintain their undivided attention for extended periods.

7) Games also allowed participants to experience novelty, curiosity, and challenge, which could stimulate learning.

8) Games might help in the development of transferable IT skills.

9) Games could act as simulations, enabling participants to engage in extraordinary activities and experience consequences like destruction or death without real-world repercussions.

Li Q., and Xiao Y. (1992, p.1) pointed out in "Game Teaching and Its Experiments" that the function of game-based teaching was not only reflected in students' easy, pleasant, and effective mastery of knowledge but also in the development of their self-control ability, organizational skills, and positive emotional qualities.

Wen J. (2022, p.48) found in her research that integrating games into teaching had the following benefits:

1) Stimulated students' interest in learning. Different students had different situations, interests, and hobbies. Therefore, teachers used game-based learning in the classroom through active, stimulating, competitive, and skillful game teaching. This approach stimulated students' interest and motivation in learning Chinese and helped them practice more and memorize the words they had learned.

2) Established a relaxed and pleasant classroom atmosphere. When teachers designed game-based teaching for classroom content, students felt relaxed and happy. Playing games, such as participating in performances and talking and laughing with classmates, reduced the pressure of learning.

3) Enhanced classroom teaching interaction and improved students' ability to understand and memorize knowledge. Teachers used game-based learning, and during the process of playing games, students strengthened their ability to memorize knowledge. After class, they recalled what they had learned, allowing them to better grasp the teaching content and apply it in daily life.

The entertaining teaching approach advocated by modern education allowed students to learn in a relaxed and pleasant environment, helping them to master knowledge faster and more effectively. In a series of studies, Bai X. (2021, pp.68-69) concluded:

1) Cultivated students' interest in learning and stimulated their motivation.

2) Activated the classroom atmosphere and improved classroom efficiency.

3) Concentrated students' attention and cultivated their learning ability.

4) Reviewed and consolidated old knowledge while enhancing their sense of competition.

In conclusion, game-based learning enhanced students' interest in learning, helped them better understand and memorize knowledge, and cultivated their ability to work in teams and solve problems independently. It also maximized the effectiveness of classroom instruction.

2.2 Traditional Approach

2.2.1 Definition of Traditional Approach

Most of the innovative teaching methods in society today were developed from traditional approaches. Although traditional approaches are older than innovative methods, they have been passed down through history. Researchers believed that current traditional approaches were relatively stable and standard methods.

The traditional approach had focused on the rational knowledge of language rules and frameworks (Liu C., Long F., 2014, p.1). In the past, teachers believed that the teacher-centered approach was more effective in the learning process, where the teacher became the primary controller in the classroom, and students merely listened and remained passive throughout the discussion (Mae R., 2017, p.1).

The traditional approach had centered on the teacher as the main focus. The teacher had directed students' learning, following a structured syllabus and curriculum. Teachers taught according to the predefined syllabus to ensure students stayed on track with their learning objectives. They had assisted students by explaining concepts, providing examples, and addressing minor doubts in the classroom. Students had regarded the teacher as a role model and had followed the instructions given in class. The teacher had been the primary speaker, and students had listened. Activities or assignments had been guided learning experiences with no room for collaboration, and talking or consulting had been considered as indiscipline. Teacher-centered education had maintained a well-ordered classroom where students did not make noise, and all activities had been under the teacher's control. Students had heavily depended on a particular teacher for their learning, with teachers overseeing every aspect of classroom activities to ensure students didn't miss any important topics (Gowda S. R. et al, 2017, p.2).

The traditional approach involved learning that occurred within the confines of the classroom, being teacher-centered and static. Learning had taken place with the entire class participating, confined to the classroom and the school. The instructor conducted the lessons based on the study program and curriculum (Titthasiri W., 2013, p.69).

A very typical feature of the traditional approach, as Broughton and his colleagues had claimed, was the "teacher-dominated interaction" (Broughton 22). The

teaching had been deeply teacher centered. This approach was explained by Assist. Prof. Dr. Abdullah Kuzu, who had asserted that it was based on the "traditional view of education, where teachers served as the source of knowledge while learners served as passive receivers" (Kuzu 36). This idea corresponded to Jim Scrivener's simile, who had claimed that the "traditional approach [was imagined working as] 'jug and mug'- the knowledge being poured from one receptacle into an empty one". This widespread attitude was based on the precondition that "being in a class in the presence of a teacher and 'listening attentively' was enough to ensure that learning would take place" (Scrivener, p.17). In his book *Communicative Language Teaching Today*, Jack C. Richards highlighted that in the traditional approach, "learning was very much seen as under the control of the teacher" (Richards 4). Thus, the traditional approach placed the responsibility for teaching and learning mainly on the teacher, with the belief that if students were present in the lesson and listened to the teacher's explanations and examples, they would be able to use the knowledge (Boumová V. B., 2008, p.11).

What was traditional grammar? One viewpoint regarding traditional grammar was that it encompassed two concepts: narrow and broad.

Narrowly speaking, traditional grammar referred to the grammar theories that had originated from ancient Greece and Rome. These theories had gained popularity in the late 18th century, before the advent of historical comparative grammar, and had dominated research on grammar and language teaching in Europe for a considerable time. This narrow perspective valued the old language model, emphasized written language and neglected oral language. It aimed to purify and standardize language, earning the label of 'prescriptive grammar,' which was adopted by most schools in their language classes. In this context, it was also referred to as 'school grammar.' Broadly speaking, traditional grammar also included scholarly traditional grammar that had originated towards the end of the 19th century. Some of this grammar had emphasized the principles of historical comparative language study, while others had focused on contemporary language phenomena. In general, both approaches had adopted a descriptivist attitude, striving to objectively describe language change and language usage (Yin Z. et.al., 1990, p.1).

The Longman Dictionary of Language Teaching and Applied Linguistics provided a similar definition of traditional grammar: "Traditional grammar is a grammar that is typically based on earlier grammars of Latin or Greek and applied to some other language, often inappropriately". It illustrated this with an example: "Some grammarians had stated that English had six CASES because Latin had six cases. These grammarians were often notional and prescriptive in their approach". Although there had been a trend towards using grammar that incorporated more modern approaches to language description and teaching, some schools had still used traditional grammar (Xia Y., 2014, p.559).

In conclusion, the traditional approach primarily involved teachers teaching textbooks on a regular basis. The teacher had controlled the classroom while students had listened. The teaching process had been relatively static and uniform.

2.2.2 The Significance of Traditional Approach

Traditional approach methods played a fundamental role in innovative teaching.

O'HEAR had thought at the time that the emphasis on achieving autonomy through the exercise of pure reason was rather uncritical. He had also endorsed the thesis, somewhat uncritically, that the role of education should be to enable students to make their own choices guided by pure reason. While maintaining the belief that education should be a liberating process for the learner-fully engaging the learner and their faculties, and enabling them to resist contemporary trends and clichés-O'HEAR's examination of the work of writers such as MacIntyre, Taylor, Williams, and Oakeshott (as cited in O'HEAR, 1987, p.1) had made him realize the extent to which the proper and effective exercise of reason must occur within the context of inherited forms of thought and experience. There was a sense in which all true education had a strongly conservative aspect.

Results indicated that traditional lecture-style teaching had been associated with significantly higher student achievement. There had been no evidence supporting detrimental effects of lecture-style teaching, even when evaluating possible selection biases due to unobservable teacher characteristics (Schwerdt G., 2011, p.1).

The traditional approach was a method of problem-solving or decision-making that had been used for a long time and had been considered established. This approach had been characterized by a step-by-step linear process, structured and based on historical data. It had several advantages, including reliability, consistency, and the use of historical data. However, it had also had some disadvantages, such as a lack of flexibility and limited creativity. The traditional approach had been used judiciously, and organizations had remained open to new and innovative solutions when appropriate (Mathew B., 2023, p.2).

In conclusion, the traditional approach had been more stable and reliable, and it had often served as the basis and starting point for innovation in new teaching methods.

2.3 Learning Achievement

2.3.1 Definition of Learning Achievement

After the teacher used one or more teaching methods, they needed to evaluate the student's completion rate of learning objectives, which was also called learning achievement.

Learning achievement was the outcome a person gained from performing certain tasks or activities. It refers to the acquisition of knowledge or skills developed by the subjects, typically indicated by test scores or the number of grades given by teachers (Asvioa N. et al., 2017, p.17).

Learning achievement was the result of all educational processes in schools. It refers to the mastery of knowledge or skills developed through subjects, usually measured by test scores or grades given by the teacher (Ulfah et al., 2016, p.1).

Learning achievement referred to the abilities that students had developed after their learning experiences. The achievement attained by students was influenced by three factors (Simbolon, 2014, cited in Kaso N. et al, 2021, p.3): (a) skills and habits, (b) knowledge and understanding, and (c) attitudes and ideals. The factor of student ability had a significant impact on the learning achievement attained. In addition to ability factors, other elements such as learning motivation, interest and attention, learning attitudes and habits, persistence, socioeconomic status, and physical and

psychological factors also played a role. From the teacher's perspective, learning achievement was achieved when learning materials were completed.

Learning achievement has always been associated with student learning outcomes. Achievement had been the result that someone has achieved in completing an activity. Gagne stated that achievement learning was divided into five aspects: intellectual ability, cognitive strategies, verbal information, attitudes, and skills. According to Bloom, as cited in Suharsimi Arikunto (Mulyana A., 2016, p.3), learning outcomes had been categorized into three aspects: cognitive, affective, and psychomotor.

Achievements had been skills or concrete results attained at a given time or during a specific period. In this research, achievement refers to the results achieved by students in the learning process. Academic achievement or academic performance indicates the extent to which a student, teacher, or institution had reached their short or long-term educational goals. The completion of educational milestones, such as secondary school diplomas and bachelor's degrees, had represented academic achievement. Academic achievement had typically been assessed through examinations or continuous assessments, although there had been no consensus on the most effective evaluation methods or which aspects were of utmost importance-procedural knowledge, such as skills, or declarative knowledge, such as facts (Ward A. et al., 1996, pp.2-5).

Furthermore, results regarding which individual factors could successfully predict academic performance had been inconclusive. Elements such as test anxiety, environment, motivation, and emotions needed to be considered when developing models of school achievement. Notably, schools had started receiving funding based on their students' academic achievements, with schools demonstrating higher academic achievements receiving more funding compared to those with fewer achievements (Zeidner M. et al., 1998, p.25).

In conclusion, learning achievement referred to the knowledge, skills, abilities, or accomplishments that students acquire during the learning process. Common methods used to assess this included tests of academic performance, achievement of goals, and mastery of skills and abilities.

2.3.2 Evaluation Method of Learning Achievement

Teaching methods could be divided into various types, and the evaluation of learning achievements could also be approached in multiple ways. Teachers could choose different evaluation methods based on the specific learning content.

Numerous factors had influenced students' test scores, including the educational approach, testing environment, and the physical health and emotional well-being of the candidates. Consequently, a more adaptable scoring system had been advocated, one that considered the characteristics of the courses, teaching objectives, teaching complexity, and the types of examination questions. For example, subjective test questions had been evaluated using methods like relative scoring and graded scoring, while objective test questions had been assessed through precise scoring and quantitative scoring. Additionally, student performance evaluations had been comprehensive, incorporating factors such as learning attitude, classroom discipline, classroom participation, daily assessments, stage examinations, final exams, and practical demonstrations, with each contributing to a specific proportion of the overall grades. This approach aimed to mitigate the negative impact of a single exam determining the overall assessment of students' academic performance.

Regarding assessment formats, various methods had been employed, including written examinations, oral examinations, closed-book assessments, open-book assessments, in-class evaluations, and hands-on skills assessments. Different courses had prioritized the evaluation of distinct student capabilities. In recent years, schools had implemented diverse evaluation methods tailored to the unique characteristics of majors and curricula. For example, in the technical secondary school nursing major and the five-year higher nursing major, student performance had been divided into categories as follows: learning attitude (10%), daily performance (class participation 10%, homework 10%), practical skills assessment (20%), and mid-term and final exam results (50%). This approach had yielded positive results and had garnered recognition from both teachers and students (Liu Y., and Yang Y., 2008, pp.93-94).

A fuzzy evaluation method had been found to be suitable for various fuzzy environments. This research, conducted with 4th graders in an elementary school, encompassed a range of fuzzy scenarios, simulating evaluations similar to those made by

a human teacher in an intuitive manner. The outcomes of this method, expressed in linguistic categories such as "GOOD" or "BAD", had been particularly valuable as they provided more adaptable assessments for students. Consequently, this study had significant educational importance as it introduced a novel evaluation standard to the educational domain and paved the way for advancing the evaluation process.

During the experiment, it had been observed that integrating fuzzy attributes was more straightforward than initially anticipated, with the attributes merging seamlessly through a simple operation that combined each attribute. However, it should be noted that this study had a limitation in its reliance on students' response times. Subsequent research would be necessary to achieve more dependable results (Weon S. et al., 2001, p.6).

The proper design of the main elements of student learning achievements had encompassed several critical steps, including the valid identification of evaluation types, the formulation of evaluation criteria, and the selection of assessment methods. The process had begun with the essential step of clarifying evaluation typology. This involved categorizing evaluation types based on several factors, including data recording (classified into formal and informal), purpose (categorized into formative and summative), validity (divided into criterion and norm-referenced), subjects (differentiating between evaluation by teachers and students), and the number of students (segmented into evaluation of individual and group work).

Following the classification of evaluation types, the next crucial aspect had been the formulation of evaluation criteria. These criteria were developed in line with specific principles, including elaborating on learning outcomes, aligning with the characteristics of the chosen type of criteria (whether threshold or grade-based), defining the same level of achievement complexity as indicated by a learning outcome, ensuring compatibility with evaluation methods and study materials, and undergoing revisions throughout studies, adhering to specified timelines (Savickiene I., 2011, p.93).

One of the research methods employed in this study included selecting participants from the study population and samples, data collection techniques, and data analysis. This study had utilized a descriptive method with the primary objective of elucidating all the responses provided by the students through a designated questionnaire.

The measurement scale employed in this research had been the Likert scale, consisting of three indicators: 1 (Agree), 2 (Doubtful), and 3 (Disagree) (Mada D. R., 2019, p.423).

In conclusion, the assessment method of academic performance referred to the systematic methods and procedures used to measure, evaluate, and record the knowledge, skills, abilities, and performance that students had acquired in academic courses or training. It included a variety of tools and techniques such as exams, quizzes, assignments, class participation, project work, and oral presentations, among others, to provide a comprehensive assessment of student academic performance and achievement. Academic performance had been influenced by various factors, including the students themselves, the learning environment, the teacher's culture, and their family. Maximizing efficiency had required the rational utilization of teaching conditions.

2.3.2 Factors Influencing Learning Achievement

Learning achievements could more intuitively show students' mastery of their learning.

According to Pujals (1986, as cited in Rahardjo A., Pertiwi S., 2020, p.57), motivation was defined as a change in energy within a person, characterized by the emergence of feelings and reactions aimed at achieving goals. Motivation had originated from the root word "motive", signifying an impulse that arose within an individual, compelling them to take action. Motivation was described as the driving force behind one's efforts, influencing their behavior and prompting them to act in pursuit of specific goals or purposes.

Nasution stated that factors affecting the learning process and results are depicted in the following chart (Nasution, 1993, p.18)

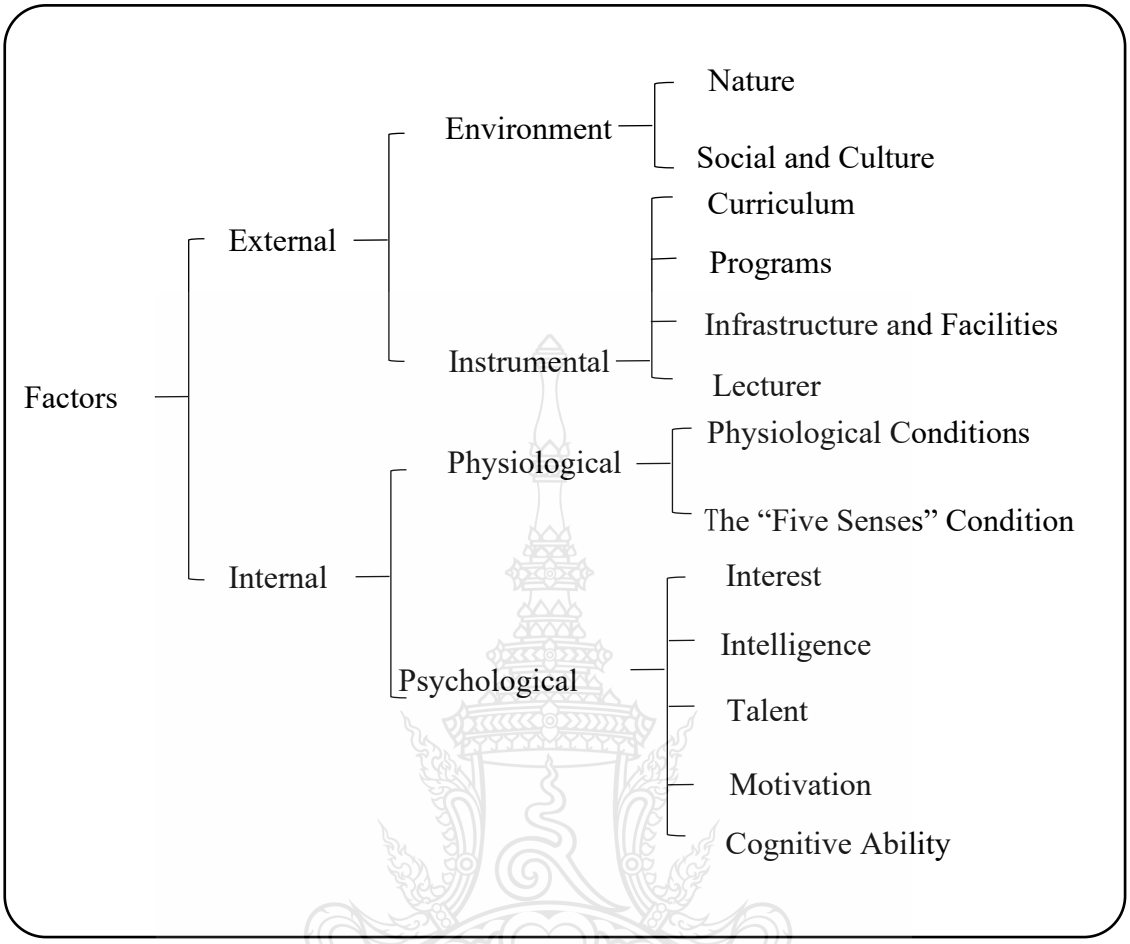

Figure 2.1 Factors of Learning Achievement

The recent literature on the factors influencing students' achievement provided a basic understanding of their responses to these factors. Four main themes representing the factors influencing students' achievement were identified based on the systematic review conducted by this study. Specifically, the first theme was the teacher factor, which encompassed the teacher’s characteristics, teaching methods or strategies, and effectiveness. The second theme was the student factor, which involved students’ attitudes, interests, and motivation. The third theme was the school factor, focusing on the school’s environment, leadership, and facilities. The fourth theme was the family factor, referring to the family’s background and support. Overall, these factors were identified as major influences on stakeholders, particularly within schools and educational institutions. By further exploring these factors through the integration of diverse research findings, stakeholders could receive guidance on improving the factors that align with students' needs, abilities, and interests (Suhaini M. et al., 2020, p.1475).

Teachers' job group and workload significantly affected academic achievement. The study concluded that the frequency of issuing assignments, teachers ensuring that students completed assignments, and the timely marking of assignments significantly impacted academic achievement. Additionally, teachers evaluating students' CAT results and providing individualized attention to weaker students also influenced academic achievement. Timely completion of the Form Four syllabus and setting performance targets for KCSE results were statistically significant predictors of academic achievement. Therefore, teacher background characteristics and classroom instructional practices made a difference in students' academic achievement (Kimani N. G. et al., 2013, p.10).

In conclusion, the factors influencing student performance could mainly be divided into social environment, school environment, humanistic environment, and teaching conditions.

2.4 Relevant Research

2.4.1 Domestic research

Chuayprakong C. (2022) studied the development of problem-solving skills using game-based learning (GBL) in monetary and fiscal policy for 6th-grade students at Dongtanwittaya School. The study aimed to 1) investigate the effectiveness of teaching and learning management in developing students' problem-solving skills through GBL, and 2) compare GBL with traditional teaching methods for 6th-grade students. The results showed that students in the experimental group, who used GBL, had significantly higher problem-solving skills on the post-test compared to their pre-test scores, with a significance level of .05. Additionally, the average post-test scores of the experimental group (6/2 A) were significantly higher than those of the control group (6/2 B), which used traditional methods, also at a significance level of .05. The study concluded that teaching management using GBL effectively enhanced students' problem-solving skills in monetary and fiscal policy, as evidenced by improved post-test scores.

Lungka P. (2021) studied the effects of game-based learning on the learning achievements of undergraduate students in an early childhood education course. The study aimed to 1) compare the learning achievements of undergraduate students

before and after using game-based learning, and 2) evaluate the satisfaction of these students with game-based learning. The study involved first-year undergraduate students enrolled in the early childhood education course at Suan Dusit University across all four campuses: Bangkok, Suphanburi, Nakornnayok, and Lampang, totaling 99 students. Data were analyzed using mean, standard deviation, dependent t-test, and relative change scores. The results indicated that the post-test scores for learning achievement in the early childhood education course were significantly higher than the pre-test scores, with a significance level of .01. The mean score increased from 9.24 before the intervention to 17.86 after it. The highest relative change score recorded was 100, while the lowest was 60. Additionally, the evaluation results revealed that students' satisfaction with game-based learning had a mean score of 4.54, indicating a high level of satisfaction.

Vongsajaem S., and Pongkitwitoon R. (2017) studied the effects of a game-based learning approach titled "Basics of Logic Gates" for first-year Vocational Certificate students majoring in Information Technology. The research aimed to develop a basic logic gate-based learning game for these students and assess its effectiveness and impact on learning achievement and student satisfaction. The efficiency of the game was measured at 80/80, reflecting its effectiveness in improving students' learning achievements. The study also evaluated students' satisfaction with the learning game. The findings revealed that: 1) The basic logic gate learning game achieved an efficiency rating of 92.07/80.00, surpassing the set criteria of 80/80. 2) The learning achievement for the group using the basic logic gate learning game had a mean score of 8.03 (standard deviation of 0.51), which was significantly higher than the control group's mean score of 5.84 (standard deviation of 7.87), with a significance level of .05. 3) Student satisfaction with the basic logic gate learning game had a mean score of 4.46 (standard deviation of .50).

Yamprayoon P. (2020) research, objectives were to: 1) compare the Chinese language course for everyday use of secondary 4 (Grade 4) students before and after learning through conventional learning management, 2) compare these skills before and after learning through language teaching for communication combined with grouping techniques, and 3) compare the skills of students who received the language teaching for communication combined with grouping techniques versus those who received conventional learning management. The research results were as follows: 1) Chinese

language course for everyday use of secondary 4 students before and after learning through conventional learning management differed significantly at the .05 level, 2) Chinese language course for everyday use of these students before and after learning through language teaching for communication combined with grouping techniques also differed significantly at the .05 level, and 3) students who learned through language teaching for communication combined with grouping techniques exhibited significantly higher Chinese language course for everyday use compared to those who learned through conventional management, with a statistical significance level of .05.

Tanago N. (2017) This study was conducted in order to explore the effectiveness of using Game-Based Learning in teaching English vocabulary and also investigate the students' attitudes towards learning vocabulary through this approach. The participants of the study were 48 first-year non-English major students who enrolled in the course of English Level 1 at a government university in Nakhon Pathom, Thailand. A one-group pretest-posttest design was applied to this study. Three nondigital games were used to teach the students for six weeks. Furthermore, a questionnaire was launched to ask the students about their attitudes towards learning vocabulary with those games. The findings revealed that the students' post-test scores were significantly higher than the students' pre-test scores. Regarding the results from questionnaire, it was found that most of the students agreed that learning vocabulary through Game-Based Learning not only helped them spell words correctly but also helped them memorize the words easier. In addition, the students accepted that learning through this approach was fun and created a good atmosphere in the classroom.

Sathirawatkul N. (2020) The objectives of this research were to develop game-based Chinese reading skill exercises for third-year students at Rattanabundit University, with the efficiency criteria of 80/80, and to compare their reading skills with those taught by traditional teaching methods. The simple random sampling method was applied to select 114 third-year students majoring in Aviation Business Management in the second semester of the 2019 academic year. The research instruments consisted of the game-based Chinese learning management plans for the Chinese for Service Industry 1 Course and the Chinese reading test. The results of the research revealed that the efficiency (E1/E2) of the game-based Chinese reading exercises was 81.38/82.89, which

was higher than the designated criteria. The Chinese reading skills of those who studied with the game-based method were higher than those of the students who studied with the traditional teaching approach at the statistical significance level of .01.

2.4.2 Foreign research

Hartt M. et al. (2020) studied the effectiveness of game-based learning. Game-based learning had emerged as an innovative technique capable of increasing student motivation, emotional involvement, and enjoyment. Their study examined the impact of game-based learning on students' perceptions of learning, engagement, and teamwork in planning education. Two lectures in an undergraduate planning course were delivered using two different teaching methods: one traditional lecture-style and one game-based. Feedback was collected through an online questionnaire and semi-structured interviews. The results indicated that students preferred and were more engaged in the game-based lecture. The study concluded that game-based learning was particularly well-suited for planning education.

Arcagok S. (2021) studied the impact of game-based teaching practices across different curricula on academic achievement. The study aimed to identify how game-based teaching practices influenced academic performance in various curricula. A meta-analysis method was employed, which involved grouping similar studies under specific criteria and combining the quantitative data obtained. A total of 412 studies conducted between 2000 and 2020 were examined, and 54 experimental studies on game-based teaching practices were included in the analysis. The data from these 54 experimental studies were analyzed using the Comprehensive Meta-Analysis (CMA) and Meta Win programs. The results indicated that game-based teaching practices positively affected students' academic achievement compared to traditional methods. The effect sizes of game-based curricula were found to vary significantly across different education levels, treatment durations, sample sizes, and publication types.

Balakrishna C. (2023) studied the impact of in-classroom, non-digital game-based learning activities on students transitioning to higher education. The initial phase of university learning significantly affected students' long-term academic development and played a crucial role in their successful transition to higher education. With higher education institutions facing challenges related to student retention and

success, the new generation of learners (millennials and Generation Z) has introduced additional complexities. This study explored how in-classroom, non-digital game-based learning techniques influenced academic performance, classroom engagement, and peer interaction among first-year university students in computing programs. The research aimed to determine how these enhanced learning experiences helped students integrate into the new university environment and successfully transition to higher education. Data were collected from first-year computing students over two consecutive years (N = 251). The results supported previous findings, showing that academic performance, classroom engagement, and peer interaction significantly improved students' academic integration. The study concluded with a discussion of the limitations and implications for practice and future research.

Anjum Zameer Bhat et al. (2023) studied the impact of game-based innovative teaching and learning environments on students' progression and performance. They found that activity-based and game-based learning environments significantly enhanced the learning experience by stimulating interest and increasing learners' attention spans and concentration. Game-based or activity-based learning was deemed essential for achieving learning objectives and improving students' overall comprehension of concepts. The study proposed a game-based activity designed not only to enhance attention and generate interest but also to address several key issues. These included: (1) the importance of revising topics, (2) identifying topics that students had not fully or partially comprehended, (3) providing feedback on delivered topics, (4) ensuring individual student progress, (5) enhancing students' attention spans, (6) creating a competitive environment, (7) boosting intrinsic motivation, and (8) improving comprehension of concepts and student progression.

Li, Y. (2021) studied the application of games in primary school literacy teaching. This research combined game-based teaching with literacy instruction. Through an analysis of the current situation, the study identified several issues, including low frequency of game use, limited game forms, unclear game goals, and insufficient coverage of students in game-based literacy teaching. Feedback from the implementation revealed that, when using game-based literacy games, teachers needed to understand students' academic conditions and clarify teaching goals; design games carefully to

enhance their enjoyment; respect individual differences and boost students' enthusiasm for literacy; clarify the role of teachers while encouraging student participation; and conduct evaluations with timely feedback. The game-based literacy teaching model effectively stimulated students' interest in literacy. During the process, students learned to collaborate, and improved their oral expression skills, thinking abilities, and creativity. Students engaged actively in classroom literacy sessions and had a positive learning experience.

Lu, Y. (2017) studied the application of educational games in primary school Chinese teaching. The research focused on incorporating the teaching principles of games throughout primary school Chinese classes to create a joyful and engaging learning environment for students. The study used fourth-year students from Shuyang Experimental Primary School as the research subjects and implemented various teaching cases. The results demonstrated that using educational games in primary school Chinese classes not only increased students' interest in learning Chinese but also fostered their imagination and creativity, contributing to their overall development. Most teachers and students found the application of educational game-based learning in Chinese teaching to be highly beneficial and hoped it could be adapted to suit the nature of different classes. The study concluded with an evaluation and reflection on the use of educational game-based learning in teaching Chinese, establishing a solid foundation for the continuous improvement and refinement of game-based teaching methods.

Xu, C. (2013) studied the application of classroom games in Chinese teaching in Indonesian primary schools. Games were recognized as an essential part of children's lives. By integrating games with language learning in Chinese classroom teaching, it was believed that not only could children's enthusiasm for learning be stimulated and language acquisition occur unconsciously during play, but their mental development could also be promoted. Using foundational theoretical knowledge of classroom games, the principle of learning accompaniment, children's learning characteristics, and the author's teaching experience, this study selected representative examples from language components practiced, such as phonetics, Chinese characters, vocabulary, grammar, and discourse. The research explored the role of games in enhancing Chinese learning, guided by the principle of learning companionship. The

effects of using games were evaluated through test scores and questionnaire surveys, and the study summarized key considerations for game-based teaching. The aim was to better understand how to cultivate primary school students' interest in learning Chinese, help them overcome the monotony of learning, and improve the quality of Chinese classroom teaching.

Bora Oktekin et al. (2016) studied the integration of game-based technology in education, emphasizing the crucial role of the educational system in national development and the impact of early education on knowledge acquisition. The research used technology-assisted second language learning (English) with a peace context to explore the impact of information and communication technologies (ICT) on learning. The study involved 5-year-old preschoolers from four classes, each with an average of 17 students, totaling 60 sample students. Knowledge acquisition and tests were conducted within the framework of in-class game-based training. Initially, tests were administered through written assessments, followed by technology-assisted game-based activities. The results indicated that teaching language using ICT in conjunction with a game-based context significantly enhanced language acquisition and increased awareness of the concept of peace. Additionally, observations revealed that technology-assisted learning reduced children's distractions and improved their learning progress.

Fabricio de, C. I. (2018) studied the use of game-based learning in education through a systematic literature review. Game-based systems have the potential to foster students' engagement and enhance their learning performance. Although the existing literature has provided relevant insights into how game-based design can be effective, several studies aimed to address the constructs used to measure the effects of game-based learning. To analyze how game-based outcomes should be properly measured, this paper systematically reviewed the literature and mapped the most frequently used scales for measuring game-based outcomes in educational contexts. The research identified motivation, engagement, self-efficacy, and flow/cognitive absorption as the primary constructs related to experiential outcomes. Additionally, the study highlighted research opportunities for better understanding the effects of extrinsic motivation rewards on experiential outcomes and problem-solving transfer, which were posited as instrumental outcomes.

In conclusion, the concept of game-based learning involved integrating game elements into the teaching process to enhance its appeal and interactivity. This approach not only facilitated better comprehension and retention of knowledge among students but also fostered their teamwork and problem-solving skills. Ultimately, it maximized the overall effectiveness of classroom instruction. Additionally, it is important to note that the application of game-based learning was not limited to language teaching alone. Given these considerations, the researcher focused on developing learning achievements in the Chinese subject through game-based learning for Primary 5 (Grade 5) students.

CHAPTER 3
RESEARCH METHODOLOGY

The research on the development of Chinese learning achievement through game-based learning for Primary 5 (Grade 5) students included the following components.

3.1 Research Design

3.2 Population and Sample

3.3 Research Instrument

3.4 Instrument Development

3.5 Data Collection

3.6 Data Analysis

3.7 Statistics Used in Research

3.1 Research Design

The study was designed as a quasi-experimental study, specifically utilizing the Pretest-Posttest Control Group design.

Table 3.1 Pretest-Posttest Control Group Design

	Pre-test	Independent variable	Post-test
E	T_1	X	T_2
C	T_1	-	T_2

Symbols Used in Experimental Design

E = Experimental group

C = Control group

X = The learning management through game-based learning

\- = The learning management through the traditional approach

T_1 = Pre-test of experimental group and control group

T_2 = Post-test of experimental group and control group

3.2 Population and Sample

3.2.1 Population

This study's population comprised 221 Primary 5 (Grade 5) students and were distributed among 5 classrooms at the Buriram primary school in Thailand, in the 2024 academic year.

3.2.2 Sample

The sample for this study consisted of 60 Primary 5 (Grade 5) students from two classrooms in a Buriram primary school in Thailand during the 2024 academic year. The students were selected through cluster random sampling. One class (30 students) was chosen as the experimental group, where students received instruction through game-based learning management, while the other class (30 students) was chosen as the control group, where students received instruction through the traditional approach.

3.3 Research Instrument

The research instruments used in the experiments and data collection were divided into categories as follows:

3.3.1 The learning management plan used learning management through a traditional approach, in the Learning Areas: Foreign Languages covered Unit 1: Language for Communication, which included two sub-learning units:

Sub-learning Unit 1: Words used in the classroom, titled "Hometown".

Sub-learning Unit 2: Speaking, introducing yourself and people close to you, titled "I'm from Beijing".

3.3.2 The learning management plan used learning management through game-based learning, in the Chinese language Course, Learning Areas: Foreign Languages for the Primary 5 (Grade 5) students was unit 1 Language for Communication follows 2 learning sub-units:

1) Sub-learning unit 1: Words used in the classroom, Title: Hometown
2) Sub-learning unit 2: Speaking, introducing yourself and people close to you, Title: I'm from Beijing.

3.3.3 The learning achievement test for the Chinese language course for Primary 5 (Grade 5) students contained 30 multiple-choice questions, each with 4 options for the pre-test and post-tests in the experimental group and control group.

3.4 Instrument Development

3.4.1 Creating an Experiment Instrument

3.4.1.1 The learning management plan used learning management through a traditional approach, in the Chinese language Course, Learning Areas: Foreign Languages for the Primary 5 (Grade 5) students. The steps of the instrument development were as follows:

1) The curriculum, Chinese language course, learning management plan, and theories and concepts related to the traditional approach were studied. The following concepts were summarized: The traditional approach mainly involved teachers regularly teaching from textbooks, with the teacher controlling the classroom and students listening. The traditional approach could be roughly divided into the following steps: 1) introduction 2) teaching and 3) conclusion.

2) Create the learning management plan using learning management through a traditional approach, the process of learning management that uses consists of 3 steps: 1) introduction 2) teaching, and 3) conclusion. The learning management plan included the following unit 1 Language for Communication follows 2 learning sub-units and titles:

(2.1) Title: Hometown (4 hours)

(2.2) Title: I'm from Beijing. (4 hours)

3) After the researchers created the learning management plan using learning management through a traditional approach for a Chinese language course, they presented it to the thesis advisor to verify the validity of the content. The learning management plan was then improved based on the advisor's advice.

4) The learning management plan using learning management through a traditional approach was presented to 5 experts, including 2 curriculum experts, 2 Chinese language experts, and 1 measurement and evaluation education expert.

The experts checked the correctness and consistency of the learning objectives, learning contents, the process of learning management through game-based learning, learning materials, and learning measurement. The scoring criteria were as follows:

Score 1: When sure that the elements of learning management plans are consistent.

Score 0: When unsure that the elements of learning management plans are consistent.

Score-1: When sure that the elements of learning management plans are not consistent.

5) The analysis of item-objective congruence (IOC) for learning management using learning management through a traditional approach showed that the IOC index had to have a value of at least 0.50. The analysis results showed that the IOC value was equal to 1.00.

6) Bring the revised learning management plan to try out with students who are not in the sample group of one classroom and improve the learning management plan with learning management using learning management through a traditional approach before collecting data.

7) Before gathering data, the learning management using learning management through a traditional approach was refined and published.

8) Data were collected in the Chinese language course using a control group, based on the learning management using learning management through a traditional approach.

3.4.1.2 The learning management plan used learning management through game-based learning, in the Chinese language Course, Learning Areas: Foreign Languages for the Primary 5 (Grade 5) students. The steps of the instrument development were as follows: in the Chinese language Course, Learning Areas: Foreign Languages for the Primary 5 (Grade 5) students. The steps of the instrument development were as follows:

1) The curriculum, Chinese language course, learning manage ment plan, and theories and concepts related to the traditional approach were studied. The following concepts were summarized:

Game-based learning integrated game elements into teaching to make it more attractive and interactive, thereby increasing students' interest in learning, enhancing the efficiency of completing classroom content and improving academic performance. Game-based learning was roughly divided into the following steps:

(1.1) Teaching Preparation: This involves preparing before teaching, determining the scope of instruction, clarifying learning objectives based on the content, and understanding the characteristics of students in advance.

(1.2) Teaching: Different content was chosen for diversified game preparations, and game tools were prepared in advance.

(1.3) Game Demo: Understanding the individual differences of students, the approach of teaching students according to their aptitude was adopted, and games were appropriately adjusted and innovated to maximize the effect.

(1.4) Game Development: The rules of classroom games were explained and demonstrated to ensure that students could fully understand and engage with them, while also observing students' adaptability and reactions.

(1.5) Summary and Evaluation: The teaching results were tested and summarized, and the process was continuously improved.

From the study of theoretical data and related concepts, the researchers identified and utilized the principles of learning management through game-based learning. The steps in game-based learning were as follows:

Table 3.2 Steps of learning management through game-based learning.

Steps of game-based learning	Steps of learning management through game-based learning
Steps 1 Teaching Preparation	Preparation before teaching involved determining the scope of instruction, clarifying learning objectives based on the content, and understanding the characteristics of students in advance.
Steps 2 Teaching	Different content was chosen for diversified game preparations, and game tools were prepared in advance.
Steps 3 Game Demo	The individual differences of students were understood, the idea of teaching students according to their aptitude was adopted, and games were appropriately adjusted and innovated to maximize the effect.
Steps 4 Game Development	The rules of classroom games were explained and demonstrated to ensure that students could fully understand and engage with them, while observing students' adaptability and reactions.
Steps 5 Summary and Evaluation	The teaching results were tested and summarized, and the process was continuously improved.

2) Create the learning management plan using learning management through game-based learning, the process of learning management that uses consists of 5 steps: 1) teaching Preparation 2) teaching, 3) game Demo 4) game Development, and 5) summary and evaluation. The learning management plan included the following unit 1 Language for Communication follows 2 learning sub-units and titles:

(2.1) Title: Hometown (4 hours)

(2.2) Title: I'm from Beijing. (4 hours)

3) After the researchers created a learning management plan using learning management through game-based learning for a Chinese language course, they presented it to the thesis advisor to verify the validity of the content. The learning management plan was then improved based on the advisor's advice.

4) The learning management plan used learning management through game-based learning was presented to 5 experts, including 2 curriculum experts, 2 Chinese language experts, and 1 measurement and evaluation education expert

The experts checked the correctness and consistency of the learning objectives, learning contents, the process of learning management through game-based learning, learning materials, and learning measurement. The scoring criteria were as follows:

Score 1: When sure that the elements of learning management plans are consistent.

Score 0: When unsure that the elements of learning management plans are consistent.

Score-1: When sure that the elements of learning management plans are not consistent.

5) The analysis of item-objective congruence (IOC) for the learning management plan using learning management through game-based learning showed that the IOC index had to have a value of at least 0.50. The analysis results showed that the IOC value was equal to 1.00.

6) Bring the revised learning management plan to try out with students who are not in the sample group of one classroom and improve the learning management plan using learning management through game-based learning before collecting data.

7) Before gathering data, the learning management plan using learning management through game-based learning was refined and published.

8) Data were collected in the Chinese language course using a control group, based on the learning management plan using learning management through game-based learning.

3.4.2 Creating a Data Collection Instrument

3.4.2.1 The learning achievement test in the Chinese language course for Primary 5 (Grade 5) students contained 30 multiple-choice questions, each with 4 options for the pre-test and post-tests in the experimental group and control group. The steps are as follows:

1) Study the course manuals for learning management and research related to measurement and evaluation as a guideline for creating a learning achievement test.

2) Create a learning achievement test in the Chinese language course following unit 1: Language for Communication follows 2 learning sub-units and 2 titles: 1) Hometown and 2) I'm from Beijing. which is a four-choice multiple-choice test of 60 items to select 30 items that pass the criteria to be consistent with the content and indicators.

3) After the researchers created the learning achievement test in the Chinese language course, they presented it to the thesis advisor to verify the validity of the content and obtain suggestions. The learning achievement test was improved based on the advisor's suggestions.

4) The learning achievement test was presented to 5 experts, including 2 curriculum experts, 2 Chinese language experts, and 1 measurement and evaluation education expert. The experts checked the correctness and consistency of the test items and learning objectives. The scoring criteria were as follows:

Score 1: When sure of the congruence between the item of the learning achievement test and the learning objectives

Score 0: When unsure of the congruence between the items of the learning achievement test and the learning objectives

Score-1: When sure the incongruence between the item of the learning achievement test and the learning objectives

The analysis of item-objective congruence (IOC) for the learning achievement test showed that the IOC index had to have a value of at least 0.50. The analysis results showed that the IOC value was equal to 0.6 - 1.00.

5) The learning achievement test for the Chinese language course was trialed with Primary 5 (Grade 5) students who were not part of the sample.

6) The difficulty and discriminating power of the learning achievement test were analyzed by specifying the quality criteria: a difficulty range of 0.20 to 0.80 and a discriminating power range from 0.20 to 1.00. Thirty quality items were selected for the test The analysis results showed that the test with a difficulty of 0.40 - 0.80 and a discriminating power from 0.50 - 0.80.

7) The results were analyzed to determine the reliability by Cronbach's alpha coefficient; α. The analysis results showed that the total confidence value test was 0.925.

8) The learning achievement test that had passed the quality checks was improved and published before data collection.

9) Data were collected using the learning achievement test for the Chinese language course with both a control group and an experimental group.

3.5 Data Collection

Researchers collected data in the following sequence:

3.5.1 Preparation Steps

3.5.1.1 Contacted a Buriram Primary School, Thailand, to request data collection using a sample from the elementary school between May and June 2024.

3.5.1.2 For support and cooperation in gathering data from the sample, the researchers contacted the principal of the primary school.

3.5.1.3 The control group and experimental group were used to explain the roles and responsibilities of the Primary 5 (Grade 5) pupils in learning management.

3.5.2 Process steps

3.5.2.1 Before the learning management, the Primary 5 (Grade 5) students in both the control and experimental groups underwent a learning achievement test in the Chinese language course.

3.5.2.2 The experimental group underwent learning management through game-based learning, while the control group received learning management through the traditional approach.

3.5.2.3 After the learning management, the Primary 5 (Grade 5) students in both the control and experimental groups underwent a learning achievement test in the Chinese language course.

3.5.3 Conclusion steps

3.5.3.1 The scores were analyzed using basic statistics and statistical methods for hypothesis testing.

3.5.3.2 The study findings were described, data were presented in tabular form, and a discussion was conducted.

3.6 Data Analysis

3.6.1 Study Instrument Quality Analysis

3.6.1.1 The Index of Item Objective Congruence (IOC) was used to analyze the effectiveness of the learning management plan. And the learning achievement test.

3.6.1.3 Cronbach Alpha Coefficient; α formula was used to reliability of the learning achievement test.

3.6.1.4 Difficulty of a learning achievement test with a passing threshold of 0.20 to 1.00.

3.6.1.5 The discriminating power of a learning achievement test should have a value of 0.20 or higher.

3.6.2 Analysis Used in Hypothesis Testing

3.6.2.1 The dependent samples t-test was used to compare Chinese learning achievement before and after learning management through a traditional approach for Primary 5 (Grade 5) students.

3.6.2.2 The dependent samples t-test was used to Chinese learning achievement before and after learning management through game-based learning for Primary 5 (Grade 5) students.

3.6.2.3 The independent samples t-test was used to Chinese learning achievement by learning management through a traditional approach and game-based learning for Primary 5 (Grade 5) students.

3.7 Statistics Used in Research

3.7.1 Basic Statistics

Descriptive statistics such as mean and standard deviation will be used to primarily analyze the data gathered from the experimental units.

3.7.1.1 Mean

$$\bar{x} = \frac{\sum x}{N}$$

$\bar{x}$ = refers to the mean

$\sum x$ = was the summation of all observations

N = was the number of observations

3.7.1.2 Standard Deviation

$$\bar{x} = \frac{\sum (x-\bar{x})^2}{n-1}$$

$x - \bar{x}$ = is the difference between the observation (score) and the mean of the distribution

$(x-\bar{x})2$ = is the squared deviation of the scores from the mean

$n - 1$ = is the number of observations minus the 1

3.7.2 Statistics Used in Quality Inspection of Instruments

3.7.2.1 Index of Item Objective Congruence (IOC)

$$IOC = \frac{\sum R}{N}$$

IOC = was the Item Objective Congruence Index

$\sum R$ = was the summation of 1 in all raters

N = was the number of items

3.7.2.2 Reliability (Cronbach Alpha Coefficient)

$$\propto = \frac{k}{k-1}\left[1-\frac{\sum s_i^2}{s_i^2}\right]$$

$\propto$ = was the Cronbach alpha coefficient

k = was the number of items

$\sum s_i^2$ = was the sum of the variances of each item

s_i^2 = was the variance of the total column

3.7.2.3 Difficulty

$$P = \frac{R}{N}$$

P = Difficulty index of the item

R = Number of correct answers to item

N = Number of correct answers plus number of incorrect answers to item

3.7.2.4 Discriminating Power

$$B = \frac{U}{n_1} - \frac{L}{n_2}$$

B = Discriminating Index

U = Correct answer in the upper group

L = Correct answer in the lower group

n_1 = No. of the examinee in the upper

n_1 = No. of the examinee in the lower

3.7.3 Statistics Used in Hypothesis Testing

3.7.3.1 The independent samples t-test was used to compare the means of two groups to determine whether there was statistical evidence that the associated sample means were significantly different.

$$t = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{s_p^2\left[\frac{1}{n_1} + \frac{1}{n_2}\right]}}$$

$\overline{x_1}$ = Mean of the first sample

$\overline{x_2}$ = Mean of the second sample

n_1 = Sample size of the first sample

n_2 = Sample size of the second sample

S_1 = Standard deviation of first sample

S_2 = Standard deviation of second sample

S_p = Pooled standard deviation

3.7.3.2 The dependent samples t-test was used to compare the means of two related groups to determine whether there was a statistically significant difference between these means.

$$t = \frac{\sum D}{\sqrt{\frac{n\sum D^2 - (\sum D)^2}{n-1}}}$$

$\sum D$ = Sum of the differences

$\sum D^2$ = Sum of the squared differences

$(\sum D)^2$ = Sum of the squared differences, squared

CHAPTER 4
RESEARCH RESULT

The study of the development of Chinese learning achievement by learning management through game-based learning for Primary 5 (Grade 5) Students. The purposes of this study were to: 1) compare Chinese learning achievement before and after learning management through a traditional approach for Primary 5 (Grade 5) students, 2) compare Chinese learning achievement before and after learning management through game-based learning for Primary 5 (Grade 5) students, and 3) compare Chinese learning achievement by learning management through a traditional approach and game-based learning for Primary 5 (Grade 5) students. The following will also be presented in this section:

4.1 The analysis compared Chinese learning achievement before and after learning management through a traditional approach for Primary 5 (Grade 5) students.

4.2 The analysis compared Chinese learning achievement before and after learning management through game-based learning for Primary 5 (Grade 5) students.

4.3 The analysis compared Chinese learning achievement through learning management through a traditional approach and game-based learning for Primary 5 (Grade 5) students.

4.1 The analysis compared Chinese learning achievement before and after learning management through a traditional approach for Primary 5 (Grade 5) students.

Comparing the Chinese learning achievement before and after learning management through a traditional approach for Primary 5 (Grade 5) students was also presented in Table 4.1 and Figure 4.1.

Table 4.1 Mean, Standard Deviation, dependent samples t-test, and level of statistical significance in the analysis to compare Chinese learning achievement before and after learning management through a traditional approach for Primary 5 (Grade 5) students.

The learning management using the traditional approach	n	$\bar{x}$	s	t	df	Sig.
Before	30	20.03	4.902	4.372	29	0.161
After	30	21.43	4.599			

*p< .05

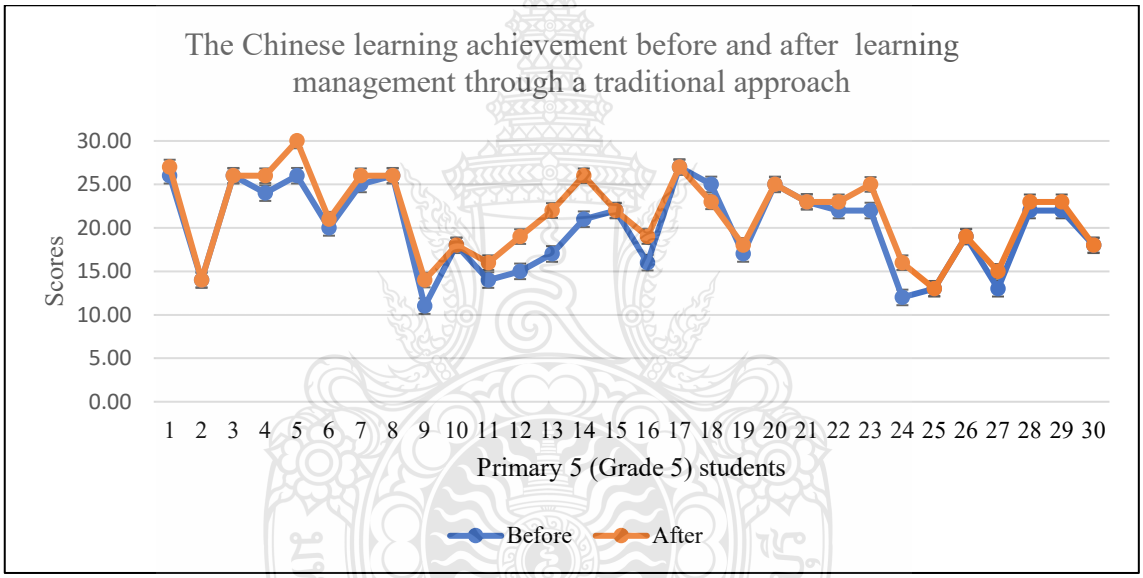

Figure 4.1 Comparison of the learning achievement in the Chinese course before and after learning management using the traditional approach for primary 5 (Grade 5) students.

Table 4.1 and Figure 4.1 showed that the students' mean Chinese learning achievement before the traditional approach was 20.03 ($\bar{x}$ = 20.03, S.D. = 4.902), and after learning, it increased to 21.43 ($\bar{x}$ = 21.43, S.D. = 4.599). When comparing the test scores for both tests, it was found that students' Chinese learning achievement after learning management through the traditional approach was significantly higher than before at a statistical significance level of .05.

4.2 The analysis compared Chinese learning achievement before and after learning management through game-based learning for Primary 5 (Grade 5) students.

Comparing the Chinese learning achievement before and after learning management through game-based learning for Primary 5 (Grade 5) students was also presented in Table 4.2 and Figure 4.2.

Table 4.2 Mean, Standard Deviation, dependent samples t-test, and the level of statistical significance in the analysis to compare Chinese learning achievement before and after learning management through game-based learning for Primary 5 (Grade 5) students.

The learning management using Game-based learning	n	$\bar{x}$	s	t	df	Sig.
Before	30	20.93	3.667	30	20.93	3.667
After	30	23.93	3.062			

*p< .05

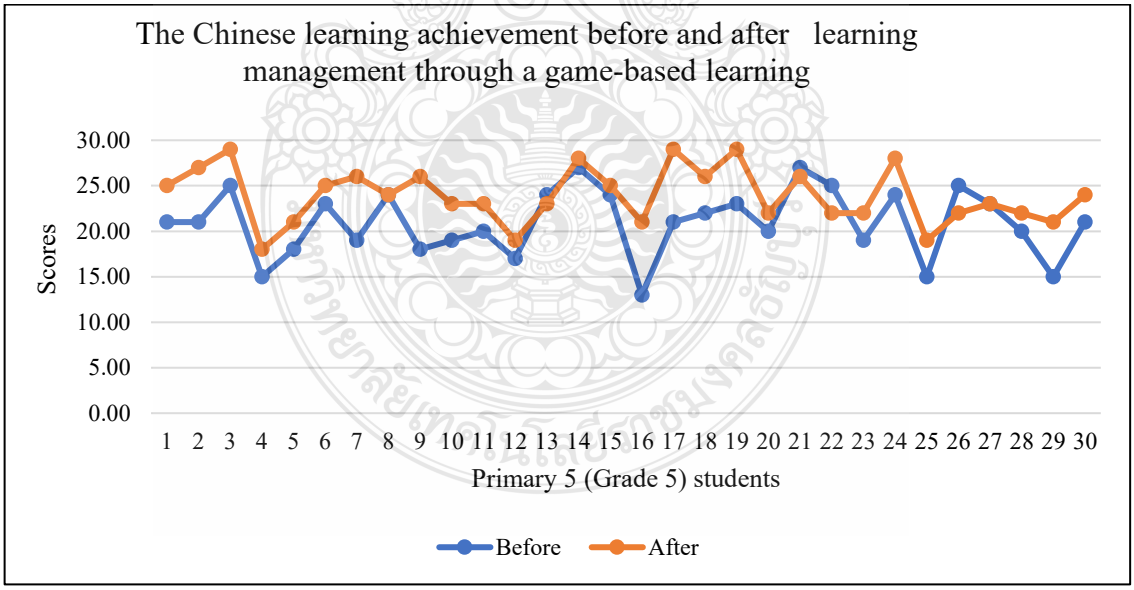

Figure 4.2 Comparison of the Chinese learning achievement before and after learning management through game-based learning for Primary 5 (Grade 5) students.

Table 4.2 and Figure 4.2 the student's learning achievement in the Chinese course had a mean of 20.93 ($\bar{x}$ = 20.93, S.D. = 3.667) before the game-based learning and

23.93 ($\overline{x}$ = 23.93, S.D. = 3.062). Compared with t-scores, it was found that the students' Chinese learning achievement after the game-based learning was significantly higher than before, at a statistical significance level of. 05.

4.3 The analysis compared Chinese learning achievement through learning management through a traditional approach and game-based learning for Primary 5 (Grade 5) students.

Comparing the Chinese learning achievement by learning management through a traditional approach and game-based learning for Primary 5 (Grade 5) students, was also presented in Table 4.3.

Table 4.3 Mean, Standard Deviation, Independent samples t-test, and the level of statistical significance in analysis to compare Chinese learning achievement by learning management through a traditional approach and game-based learning for Primary 5 (Grade 5) students.

Learning Management	n	$\overline{x}$	s	t	df	Sig. (2-tailed)
The learning management using the traditional approach	30	11.73	1.701	-4.254*	58	0.000
The learning management using Game-based learning	30	13.83	2.102			

*p< .05

Table 4.3 showed that the students' Chinese learning achievement had a mean score of 21.43 ($\overline{x}$ = 21.43, S.D. = 4.599) with the traditional approach and 23.93 ($\overline{x}$ = 23.93, S.D. = 3.062) with game-based learning. When comparing the test scores, it was found that the Chinese learning achievement of students using game-based learning was significantly higher than those using the traditional approach, at a statistical significance level of .05.

CHAPTER 5
CONCLUSION AND RECOMMENDATIONS

The study focused on developing Chinese language achievement through learning management using game-based learning for Primary 5 (Grade 5) students. The purposes of this study were to: 1) compare Chinese learning achievement before and after learning management through a traditional approach for Primary 5 (Grade 5) students, 2) compare Chinese learning achievement before and after learning management through game-based learning for Primary 5 (Grade 5) students, and 3) compare Chinese learning achievement by learning management through a traditional approach and game-based learning for Primary 5 (Grade 5) students. The research sample consisted of 60 Primary 5 (Grade 5) students from a Buriram Primary School in Thailand during the 2024 academic year. Two classes, with a total of 60 elementary school students, were selected. One class (30 students) was chosen to serve as the experimental group, with students experiencing learning management through game-based learning, while the other class (30 students) was chosen to serve as the control group, with students experiencing learning management through the traditional approach. The classes were selected by random cluster sampling. The statistical methods used included the mean, standard deviation, independent samples t-test, and dependent samples t-test. The results of these analyses were presented in this study.

5.1 Summary of Research Results

5.2 Discussion and Recommendations

5.3 Implication for Practice and Future Research

5.1 Summary of Research Results

5.1.1 The results comparing Chinese learning achievement before and after learning management through a traditional approach for Primary 5 (Grade 5) students revealed that the students' mean Chinese learning achievement before the traditional approach was 20.03 ($\overline{X}$ = 20.03, S.D. = 4.902), and after learning, it increased to 21.43 ($\overline{X}$ = 21.43, S.D. = 4.599). When comparing the test scores for both tests, it was found that students' Chinese learning achievement after learning management through the

traditional approach was significantly higher than before at a statistical significance level of .05.

5.1.2 The results comparing Chinese learning achievement before and after implementing game-based learning for Primary 5 (Grade 5) students revealed that the student's learning achievement in the Chinese course had a mean of 20.93 ($\overline{X}$ = 20.93, S.D. = 3.667) before the game-based learning and 23.93 ($\overline{X}$ = 23.93, S.D. = 3.062). Comparing with t-scores, it was found that the student's Chinese learning achievement after the game-based learning was significantly higher than before, at a statistical significance level of .05.

5.1.3 The results comparing Chinese learning achievement through traditional learning management and game-based learning for Primary 5 (Grade 5) students revealed that the students' Chinese learning achievement had a mean score of 21.43 ($\overline{X}$ = 21.43, S.D. = 4.599) with the traditional approach and 23.93 ($\overline{X}$ = 23.93, S.D. = 3.062) with game-based learning. When comparing the test scores, it was found that the Chinese learning achievement of students using game-based learning was significantly higher than those using the traditional approach, at a statistical significance level of .05.

5.2 Discussion and Recommendations

5.2.1 Chinese learning achievement by learning management through a traditional approach was higher than before at the statistical significance level of .05 because the traditional approach was the teachers' ability to provide personalized attention and immediate feedback to students. This direct interaction allowed educators to address individual student needs, helping to clarify misunderstandings and guide learning effectively (Hattie J., and Timperley H., 2007). Students were motivated by both the teacher and their classmates. It was a strategy in which a teacher moderated and controlled the flow of information and knowledge. Students were required to continue strengthening their topic knowledge outside of school by completing homework activities. Students' sole resource in this situation was their instructor, who only taught them face-to-face (Vyas M., 2023, p.3986). Although traditional lecture-style teaching, it could be effective at improving test scores.

According to the study conducted by Guido Schwerdt et al. (2011, pp.365-379), increasing the overall time devoted to lecture-style teaching led to an increase in test scores when explicitly including the two problem-solving categories and the other class activities. In congruence with the findings of Yamprayoon, P. (2020). the research results were that Chinese speaking skills for everyday use of secondary 4 students before and after learning through conventional learning management were different at a significance level of .05. According to a study by Wang and Wu (2020), students who were taught using traditional methods, which included structured classroom settings and direct teacher-student interaction, showed a significant improvement in their Chinese language achievement. The study also reported a statistically significant increase in test scores, with a p-value of less than .05, indicating that traditional learning management had a positive impact on student outcomes.

5.2.2 Chinese learning achievement by learning management through game-based learning was higher than before at the statistical significance level of .05 because game-based learning involved using language game activities to reinforce and enhance students' acquired knowledge. It served as a means to review and extract practiced language skills and apply them effectively in real-life communication scenarios. This approach not only enlivened the classroom atmosphere but also ensured the attainment of instructional objectives, thereby enhancing overall teaching efficacy. (Zhu L., 2008, p.86). According to Perrotta, et al. (2013), game-based learning (GBL) is a methodology that incorporates elements of game theory into the educational process. It was compatible with students because games were a necessary element that should have existed in their learning process. In congruence with Wu Y. (1996. p.24) game-based learning, students learned more naturally in a relaxed mood with strong interest. It allowed children to learn in a relaxed and cheerful way. In the game activities and atmosphere, students naturally learned the knowledge in the textbook and acquired more extracurricular knowledge than they would have otherwise. Moreover, Fajarina N. (2017) stated that utilizing games in the classroom encouraged students to be more involved and engaged with each other. In alignment with this, students exhibited increased enthusiasm for playing games, attributing their positive feelings to the engaging and stimulating nature of the learning process.

Following the findings of Yang X. (2019), students' learning ability in reading Chinese aloud after using games and learning activities was higher than before using them, with a significance level of .05. The students' posttest mean was 27.03, whereas the students' pretest mean was 13.57, respectively. In line with the findings of Wattanakamolkul1, P., and Somkanae, M. (2021) the comparison of learning by memorization before and after teaching and learning management by using games through applications showed that scores after learning were significantly high at the level of .01. Consistent with Satsin, K. et, al., (2019) after using games, the students had post-achievement test scores higher than the pretest at a .05 statistically significant level, according to the hypothesis that using games for students would increase students' achievement of Pinyin reading and enhance Chinese learning. Similarly, Rungbanjit, W. and Rungbanjit, W. (2021) found that after implementing Chinese word games, the mean posttest score of 35 students was 15.11, which was higher than the mean pretest score of 9.46, accounting for the difference of 5.66 points with a statistical significance level of .05. Research showed that game-based learning had learning management efficacy for increased academic results.

5.2.3 Chinese learning achievement of those studying by learning management through game-based learning was higher than those studying through a traditional approach at the statistical significance level of .05, because the traditional approach was a one-way conversation in which an instructor delivered the information before the audience (Gholami J. et al., 2016). After the lecture, the instructor gave notes and assigned some tasks as homework (Gregorius, 2017). In traditional lecture teaching methods, no feedback session for the learners was conducted (Almanasef M. et al., 2020). Generally, very little conversation happened between the learners and instructors (Sarıhan A. et al., 2016). The learners received a passive strategy of learning (Maqbool et al., 2018), while the game-based learning was conducted through captivating games, allowing students to break away from monotonous teaching modes, acquire knowledge in a more relaxed and unrestricted manner, and stimulate their enthusiasm for active learning and exploration (Wen J., 2022, p.6). Consistent with Li Qingsong and Xiao Yan (as cited in Wang L., 2011, p.67) in their work "Game Teaching and Its Experiment," the efficacy of game

teaching had gone beyond facilitating students' easy, enjoyable, and effective grasp of knowledge. It has also been evident in the enhancement of students' self-control abilities, organizational skills, and positive emotional qualities. Both game-based learning and game-based learning served as effective strategies for cultivating such skills (Liu Z., 2020, p.1).

Following the findings of Yang X. (2019), students' learning ability in reading Chinese aloud after using games and learning activities was higher than before using them, with a level of significance of .05. The students' posttest mean was 27.03, whereas the students' pretest mean was 13.57, respectively. In line with the findings of Wattanakamolkul1, P., and Somkanae, M. (2021) the comparison of learning by memorization before and after teaching and learning management by using games through applications showed that scores after learning were significantly high at the level of .01. Consistent with Satsin, K. et al. (2019) after using games, the students had post-achievement test scores higher than the pretest at a .05 statistically significant level. According to the hypothesis, using games would increase students' Pinyin reading achievement and enhance Chinese learning. Similarly, Rungbanjit, W. and Rungbanjit, W. (2021) after implementing Chinese word games, the mean posttest score of 35 students was 15.11, which was higher than the mean pretest score of 9.46, accounting for the difference of 5.66 points with a statistical significance level of .05. This research demonstrated that game-based learning was an effective instructional strategy for improving academic outcomes.

5.3 Implication for Practice and Future Research

5.3.1 Suggestions for Applying the Research Results

5.3.1.1 Game-based learning integrated the use of games as a tool for teaching children's new concepts, transforming schoolwork from a source of stress into an enjoyable and engaging experience. This approach fostered a collaborative environment where children worked together, exchanged ideas, and practiced newly acquired knowledge in a relaxed setting. As a result, it enhanced their understanding and made the learning process more enjoyable. To effectively incorporate game-based

learning into traditional classrooms, it was recommended that teachers integrate appropriate game elements into their teaching strategies. For instance, educators could have increased students' interest and participation by designing educational games, organizing group competitions, or implementing interactive classroom activities related to the course content.

5.3.1.2 For the successful implementation of game-based learning, teachers needed to receive professional training. This training should have covered game design principles, techniques for integrating games into the classroom, and methods for aligning games with course objectives. By enhancing their expertise in game-based teaching methods, teachers were better equipped to design and implement gamified instructional activities, ultimately improving both teaching quality and student learning outcomes.

5.3.2 Suggestions for Future Research

For further research, the topic should focus on:

5.3.2.1 Future research should have delved into the specific effects of different types of educational games, such as simulation games, role-playing games, and puzzle games, on student learning outcomes. By comparing the impact of various game types on teaching, researchers could have determined which types were most effective in enhancing student learning. These studies would have assisted educators in selecting the game types that best aligned with their teaching goals and met the needs of their students, thereby optimizing educational outcomes.

5.3.2.2 Game-teaching not only influenced academic performance but also affected students' psychological and emotional development. Future research should evaluate the effects of game-based teaching methods on students' mental health, stress levels, emotional regulation, and self-efficacy. Understanding the potential of game-based learning to promote students' mental well-being and emotional development would have helped educators use these methods to enhance overall student performance.

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APPENDICES

APPENDIX A

- **List of Experts Reviewing Research Instruments**
- **Sample Letter to Experts and Specialists for Research Tools Validation**

List of Experts Reviewing Research Instruments

Content Specialists

1. Teacher Zhang Xuning
   Zigong Hengchuan Experimental School, Zigong, China.
2. Assistant Lecturer Li Xingchuan
   Sichuan Province Yibin vocational and technical school, Zigong, China.
3. Dr. Saengrung Poolsuwan
   Aksorn CharoenTat ACT Co., Ltd., Thailand.
4. Dr. pongsathorn kittachotworakul.
   Hui mingtang Chinese classroom, Pattaya, Thailand.
5. Dr. Surat Kwanboonchan
   Faculty of Technical Education, Rajamangala University of Technology Thanyaburi, Thailand.

No. 0649.02/0270.1

Faculty of Technical Education
Rajamangala University of Technology
Thanyaburi
39 Moo 1, Rangsit-Nakhon Nayok Road,
Klong Hok, Khlong Luang, Pathum Thani
Postal Code 12110, Thailand

1 March 2024

Subject Invitation letter inviting experts to validate research instruments

Dear Mr. Zhang Xuning

Due to Ms.Sijia Shen , a student who is taking up Master of Education Program in Curriculum Development and Instructional Innovation, Faculty of Technical Education, Rajamangala University of Technology Thanyaburi (RMUTT), is currently processing a thesis for this semester entitled "The Development of Learning Achievement in Chinese Subject by the Learning Management through game - based Learning for Primary 4 (Grade 4) student." with Asst. Prof. Dr. Rossarin Jermtatsong , a research advisor.

In relation to this, the researcher has a strong desire to be assisted with regard to the validation of the instruments required studies. The curriculum administration committee consider that you are the most qualified professional with knowledge and capabilities to provide such, the researcher has chosen and would like to ask approval from your good office to be the evaluator. I would like to invite you to be an expert to the validation research instruments for Ms.Sijia Shen for the benefit of further education. I am highly anticipating your kind approval regarding this matter.

Thank you for your kind consideration.

Sincerely Yours,

(Asst. Prof. Arnon Niyomphol)
Dean, Faculty of Technical Education

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1 March 2024

Subject Invitation letter inviting experts to validate research instruments

Dear Assistant Lecturer Li Xingchuan

Due to Ms.Sijia Shen , a student who is taking up Master of Education Program in Curriculum Development and Instructional Innovation, Faculty of Technical Education, Rajamangala University of Technology Thanyaburi (RMUTT), is currently processing a thesis for this semester entitled "The Development of Learning Achievement in Chinese Subject by the Learning Management through game - based Learning for Primary 4 (Grade 4) student." with Asst. Prof. Dr. Rossarin Jermtatsong , a research advisor.

In relation to this, the researcher has a strong desire to be assisted with regard to the validation of the instruments required studies. The curriculum administration committee consider that you are the most qualified professional with knowledge and capabilities to provide such, the researcher has chosen and would like to ask approval from your good office to be the evaluator. I would like to invite you to be an expert to the validation research instruments for Ms.Sijia Shen for the benefit of further education. I am highly anticipating your kind approval regarding this matter.

Thank you for your kind consideration.

Sincerely Yours,

(Asst. Prof. Arnon Niyomphol)
Dean, Faculty of Technical Education

Department of Education
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Rajamangala University of Technology
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Postal Code 12110, Thailand

1 March 2024

Subject Invitation letter inviting experts to validate research instruments

Dear Dr.Saengrung Poolsuwan

Due to Ms.Sijia Shen , a student who is taking up Master of Education Program in Curriculum Development and Instructional Innovation, Faculty of Technical Education, Rajamangala University of Technology Thanyaburi (RMUTT), is currently processing a thesis for this semester entitled "The Development of Learning Achievement in Chinese Subject by the Learning Management through game - based Learning for Primary 4 (Grade 4) student." with Asst. Prof. Dr. Rossarin Jermtatsong , a research advisor.

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1 March 2024

Subject Invitation letter inviting experts to validate research instruments

Dear Dr.Surat Kwanboonchan

Due to Ms.Sijia Shen , a student who is taking up Master of Education Program in Curriculum Development and Instructional Innovation, Faculty of Technical Education, Rajamangala University of Technology Thanyaburi (RMUTT), is currently processing a thesis for this semester entitled "The Development of Learning Achievement in Chinese Subject by the Learning Management through game - based Learning for Primary 4 (Grade 4) student." with Asst. Prof. Dr. Rossarin Jermtatsong , a research advisor.

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1 March 2024

Subject Invitation letter inviting experts to validate research instruments

Dear Dr. Pongsathorn kittachotworakul

Due to Ms.Sijia Shen , a student who is taking up Master of Education Program in Curriculum Development and Instructional Innovation, Faculty of Technical Education, Rajamangala University of Technology Thanyaburi (RMUTT), is currently processing a thesis for this semester entitled "The Development of Learning Achievement in Chinese Subject by the Learning Management through game - based Learning for Primary 4 (Grade 4) student." with Asst. Prof. Dr. Rossarin Jermtatsong , a research advisor.

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APPENDIX B

Instrument of Research

Course content structure

Course Code: 15201 Chinese language

Learning Areas: Foreign Languages

Primary 5 (Grade 5)

Unit	Name of learning unit / sub-learning unit	Standards / Indicators	Title	Content	Time (hours)
1	**Language for Communication** - Words used in the classroom	FL1.1 G.5/1 FL1.2 G.5/2	Hometown	1. Vocabulary of food: candied haws, durian, black tea, hamburger, pickles, sushi 2. Name of city 3. Name of food in the city	4
2	-Speaking, introducing yourself and people close to you	FL1.2 G.5/1	I'm from Beijing	1. Sentences for introduction to your city 2. Conversation about your city	4
Total					**8**

Example

Lesson Plan 1: Traditional Learning

Course Code: `15201 Chinese language	Learning Areas: Foreign Languages
Unit 1	Language for Communication
Sub-learning unit	Words used in the classroom
Lesson Title	Hometown
Level: Primary 5 (Grade 5)	**Lesson Duration**: 4 hours

Standards / Indicators

Strand 1: Language for Communication

FL 1.1 Understanding and ability in interpreting what has been heard and read from various types of media, and ability to express opinions with reasons.

G.5/1 Act in compliance with orders, requests and simple instructions heard and read.

FL 1.2 Possessing language communication skills for effective exchange of information; efficient expression of feelings and opinions.

G.5/2 Use orders, requests, permission and give simple instructions.

Lesson objectives

1. Students can understand and master new vocabulary: candied haws, durian, black tea, hamburger, pickles, sushi.
2. Be able to pronounce words correctly and use them for simple communication.
3. Through vocabulary learning, guide students to understand the status of different foods in Thai culture and their application in daily life.
4. Students can discuss their favorite foods in groups.

Learning content

1. Vocabulary of food: candied haws, durian, black tea, hamburger, pickles, sushi
2. Name of city
3. Name of food in the city

Activity

The traditional approach can be divided into the following steps:	The traditional approach can do the following management activities:
1. Introduction	1. Introduce the topic: At the beginning of the class, use an engaging question or situation to arouse students' interest, such as: "What special foods do you like to eat?" Or show some pictures of delicious food to stimulate students' curiosity. 2. Show new words: Use multimedia or physical objects to display the images of candied haws, durian, black tea, hamburgers, pickles, and sushi to ensure that students can see and hear these words. Introduce the pronunciation and simple culture or story behind each word to increase students' understanding of vocabulary.
2. Teaching	3. Learn pronunciation and spelling: Conduct pronunciation training to encourage students to imitate correct pronunciation and correct their pronunciation errors. Use pinyin or the alphabet to help students understand how each word is spelled, including spelling games or spelling contests. 4. Situational application: Create a realistic scenario, such as a simulated restaurant situation, and have students use these words to order or describe their favorite food.

The traditional approach can be divided into the following steps:	The traditional approach can do the following management activities:
	Conduct group cooperation activities to allow students to communicate in teams, use newly learned vocabulary, and deepen their understanding and application of vocabulary 5. activities: Design memory activities to help students consolidate the vocabulary they have learned. Students are encouraged to actively participate in activities and learn through practice to enhance their interest in learning.
3. Conclusion	6. Review points: Review new vocabulary words students learn in class, with an emphasis on pronunciation, spelling, and application. Students' memory of new vocabulary can be consolidated through questions and answers, review games, etc. 7. Emphasis on practical application: Encourage students to use newly learned vocabulary in daily life and help them apply the language to real-life situations. Students can be given simple tasks such as writing a short essay about their favorite food.

Materials/Resources

1. Pictures or real objects: Used to introduce course themes and allow students to intuitively feel the appearance of vocabulary.

2. Whiteboard or PPT: Used to display pinyin and letter forms to help students pronounce and spell correctly.

3. Memory Cards: Used for games and activities to enhance students' memory of vocabular.

Assessment

Assessment method	Assessment Tool	Assessment Criteria
Observations	Observations Form	Pass 60 Percentage
Testing	Test	Pass 50 Percentage

Observations Form

Course code 15201 **Course** Chinese language.

Name of learning unit / sub-learning unit ……

Title…….

Semester at……**Academic Year**……..…… school .....

No	name - surname	Behavior/Score															
		Intention to do activities			Participation in expressing			Being a leader and a			Helping others			Respect for rules			Total
		3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	

Scoring criteria

Level 3 means good behavior

Level 2 means moderate behaviors

Level 1 means improving behaviors

Assessment Criteria Full Score 15 points

A score 13 - 15 means good

A score 9 - 12 means moderate

A score of 5 - 8 means improvement

.....

(…….)

Teacher

Example

Lesson Plan 1: Game-based learning

Course Code: `15201 Chinese language	Learning Areas: Foreign Languages
Unit 1	Language for Communication
Sub-learning unit	Words used in the classroom
Lesson Title	Hometown
Level: Primary 5 (Grade 5)	**Lesson Duration**: 4 hours

Standards / Indicators

Strand 1: Language for Communication

FL 1.1 Understanding and ability in interpreting what has been heard and read from various types of media, and ability to express opinions with reasons.

G.5/1 Act in compliance with orders, requests and simple instructions heard and read.

FL 1.2 Possessing language communication skills for effective exchange of information; efficient expression of feelings and opinions.

G.5/2 Use orders, requests, permission and give simple instructtions.

Lesson objectives

1. Students can understand and master new vocabulary: candied haws, durian, black tea, hamburger, pickles, sushi.
2. Be able to pronounce words correctly and use them for simple communication.
3. Through vocabulary learning, guide students to understand the status of different foods in Thai culture and their application in daily life.
4. Students can discuss their favorite foods in groups.

Learning content

1. Vocabulary of food: candied haws, durian, black tea, hamburger, pickles, sushi
2. Name of city
3. Name of food in city

Activity

Step of the learning management using the game-based learning	Activity of the learning management using the game-based learning
1. Teaching Preparation	1. Material preparation: Prepare cards or drawings with pictures and words of food such as "candied haws, durian, black tea, hamburgers, pickles, sushi" printed on them. Prepare enough cards to ensure that every student can participate in the game. 2. Teaching space layout: Arrange the space in the classroom so that students can move freely and facilitate game activities. Make sure there are adequate visual and auditory aids in the classroom, such as whiteboards, projectors, etc.
2. Teaching	3. Introduce food vocabulary: Through interesting stories or situations, introduce the food vocabulary of "candied haws, durian, black tea, hamburger, pickles, sushi". Guide students to express their opinions on these foods and stimulate their interest. 4. Pronunciation and vocabulary practice: The teacher will demonstrate pronunciation, and students will imitate the correct pronunciation, emphasizing the key pronunciation parts of each vocabulary word. Conduct group or individual pronunciation and vocabulary exercises to ensure students master these new vocabulary words. 5. Context establishment: Create simple scenes, such as simulating restaurant ordering scenes,

Step of the learning management using the game-based learning	Activity of the learning management using the game-based learning
	to allow students to use these vocabulary words in context and improve their practical application abilities.
3. Game Demo	6. Explanation of game goals and rules: Explain the goal of the game, which is to memorize and learn the words "candied haws, durian, black tea, hamburger, pickles, sushi" through the card game. Explain the rules of the game, including how to distribute cards, memory time, matching rules, etc. 7. Card distribution and memory time: Distribute the cards to students and let them watch and memorize the food vocabulary on them within a certain period of time. Use this time to play food-related audio to reinforce students' impressions of vocabulary 8. Card matching game: Students are divided into groups and play a card matching game to match as many correct food cards as possible. During the game, students are encouraged to communicate in the target language and deepen their understanding and use of vocabulary.
4. Game Development	9. Group collaboration and communication: Supervise students to collaborate in groups and help each other memorize and match cards. Encourage students to use newly learned vocabulary to enhance teamwork and language expression skills.

Step of the learning management using the game-based learning	Activity of the learning management using the game-based learning
	10. Rewards and feedback: Set up a reward mechanism, for example, teams that successfully match will receive rewards to encourage students to actively participate in the game. Provide real-time feedback to correct pronunciation errors and reinforce correct language use. 11. End of game and summary: At the end of the card matching game, give a brief summary of the students' performance and announce the winning team. Guide students to review the words "candied haws, durian, black tea, hamburger, pickles, sushi" to deepen their memory.
5.Summary and Evaluation	12. Evaluation of learning effects: Evaluate the effect of students' memory and use of the words "candied haws, durian, black tea, hamburger, pickles, sushi". Gather feedback from students about their experiences and learnings from the game. 13. Teaching reflection and outlook: Review the teaching process with students and listen to their feedback and feelings. Look forward to the next step of learning and stimulate students' interest and confidence in language learning.

Materials/Resources

1. Pictures or real objects: Used to introduce course themes and allow students to intuitively feel the appearance of vocabulary.

2. Whiteboard or PPT: Used to display pinyin and letter forms to help students pronounce and spell correctly.

3. Memory Cards: Used for games and activities to enhance students' memory of vocabular.

Assessment

Assessment method	Assessment Tool	Assessment Criteria
Observations	Observations Form	Pass 60 Percentage
Testing	Test	Pass 50 Percentage

Game 1

Game name:

Food Market

Game objectives:

1. Enhance students' memory and understanding of Chinese vocabulary.
2. Stimulate students' interest and understanding of food.
3. Cultivate students' teamwork ability and quick response ability.

Game Preparation:

1. prepare a series of food related vocabulary cards.
2. Arrange the classroom as a small "market" with tables and chairs to simulate different stalls.
3. Prepare some pictures of the food and name that match the stall.

Game Preparation:

1. Divide the students into 6 groups, 5-6 people in each group.

2. Each team selects a captain who is responsible for leading the team members to complete the task.

3. each group holds the corresponding color of the graphic game.

4. At the beginning of the game, the teacher shows all groups a picture of food and gives the group 30 seconds to discuss and determine where the food belongs to the stall.

5. At the end of the discussion, each group leader leads the players to the booth they think is correct and places the card where it is given to the booth.

6. After the picture display is completed, the teacher will check whether the food on the card matches the booth. If yes, the team will be given one point and the card will be kept on the booth; If not, no points are awarded and the card is returned to the team.

7. The game continues until all cards have been used. Finally, according to the scores of each group, the winning group is selected and rewarded.

游戏一

游戏名称:

食物市场

玩家人数：34人

游戏目标:

1. 增强学生对汉语词汇的记忆和理解。
2. 激发学生对食物的兴趣和理解。
3. 培养学生的团队合作能力和快速反应能力。

游戏准备:

1.准备一系列与食物相关的词汇卡。
2. 把教室布置成一个小"市场"，用桌椅模拟不同的摊位。
3. 准备一些与摊位相匹配的食物图片和名字。

游戏规则:

1. 将学生分成6组，每组 5-6人。

2. 每队选出一名队长，负责带领队员完成任务。

3. 每组持有对应颜色的图形游戏。

4. 游戏开始时，老师给每个小组展示一张食物的图片，并给小组30秒的时间讨论并确定食物属于摊位的位置。

5. 在讨论结束时，每个小组的领导将玩家带到他们认为正确的摊位，并将卡片放在给予摊位的地方。

6. 图片展示完成后，老师会检查卡片上的食物与摊位是否匹配。如果是，则加1分，卡片将保留在展位上;如果没有，则不记分，并将该卡退还给该队。

7. 游戏继续，直到所有的卡牌都用完。最后，根据各组的得分，选出优胜组并给予奖励。

Learning achievement test of Chinese language

Learning Areas: Foreign Languages

Level: Primary 5 (Grade 5)

1. What is the Chinese word for "candied haws"?

liúlián	tánghú lu	hóngchá	hànbǎobāo
A.榴 莲	**B. 糖 葫芦**	C. 红 茶	D. 汉 堡 包

2. What is the Chinese word for "durian"?

lǜ chá	hóngchá	hànbǎobāo	liúlián
A.绿 茶	B. 红 茶	C. 汉 堡 包	**D.榴 莲**

3. What is the Chinese word for "black tea"?

lǜ chá	hànbǎobāo	hóngchá	liúlián
A.绿 茶	B. 汉 堡 包	**C. 红 茶**	D.榴 莲

4. What is the Chinese word for "hamburger"?

pàocài	tánghú lu	shòu sī	hànbǎobāo
A. 泡 菜	B. 糖 葫芦	C. 寿 司	**D. 汉 堡 包**

5. What is the Chinese word for "泰国"?

A.(tài guó) B.(zhōng guó) C.(měi guó) D.(yīng guó)

6. What is the pinyin for "中国"?

A.(hán guó) **B.(zhōng guó)** C.(yīng guó) D.(měi guó)

7. How to write this place in Chinese?

màngǔ	dōngjīng
A. 曼 谷	B. 东 京
zhījiā gē	xī ní
C.芝加哥	D.悉尼

8. How to write this place in Chinese?

xī ní
A.悉尼

màngǔ
B. 曼 谷

zhījiāgē
C.芝加哥

dōngjīng
D. 东 京

9. How to write this place in Chinese?

dōngjīng
A. 东 京

zhījiāgē
B.芝加哥

xī ní
C.悉尼

màngǔ
D. 曼 谷

10. What is the Chinese word for "Chicago"?

zhījiāgē
A.芝加哥

dōngjīng
B. 东 京

màngǔ
C. 曼 谷

xī ní
D.悉尼

11. How to write this food in Chinese?

shòu sī
A. 寿 司

qiǎokè lì
B. 巧 克力

xìngrén
C. 杏 仁

shānzhú
C. 山 竹

12. How to write this food in Chinese?

xìngrén
A. 杏 仁

shānzhú
B. 山 竹

shòu sī
C. 寿 司

tánghú lu
D. 糖 葫芦

13. How to write this food in Chinese?

tánghú lu
A. 糖 葫芦

hànbǎobāo
B. 汉 堡 包

bàomǐhuā
C. 爆 米 花

qiǎokè lì
D. 巧 克力

14. When you meet your teacher for the first time, you should say:

nǐ hǎo
A. 你 好

qǐngwèn
B. 请 问

hǎowán
C. 好 玩

gāoxìng
D. 高 兴

15. If you want to tell your new friend your name, you will say:

wǒjiào
A. 我 叫

nǐ jiào
B. 你 叫

nǐ shìshuí
C. 你是 谁

wǒ xǐ huan
D. 我喜 欢

16. When you see a friend and need to say hello, you should say:

nǐ hǎo
A. 你 好

xièxiè
B. 谢 谢

búkè qì
C. 不客气

hǎode
D. 好 的

17. Say it when you need to ask a new friend his or her name:

nǐ hǎo
A. 你 好

nǐ jiàoshénmeméng zì
B. 你 叫 什 么 名 字

nǐ cóngnǎ lǐ lái
C. 你 从 哪里来

zhè lǐ yǒushénmehàochīde
D. 这 里 有 什 么 好 吃 的

18. You should say it when you say your name

wǒjiào
A. 我 叫

tā jiào
B. 他 叫

tā jiào
C. 她 叫

nǐ jiào
D. 你 叫

19. Say it when you say hello:

rènshi nǐ menhěngāoxìng — nǐ cóngnǎ lǐ lái

A. 认 识 你 们 很 高 兴 — B. 你 从 哪里来

wǒcóngmàngǔlái — běijīnghǎowánma

C. 我 从 曼 谷来 — D. 北 京 好 玩 吗

20. What do you say when you ask a new friend where they're from

wǒcóngmàngǔlái — qǐngwèn tācóngnǎlǐlái

A. 我从曼谷来 — B. 请问 ，她从哪里来

qǐngwèn nǐcóngnǎlǐlái — qǐngwèn wǒcóngnǎlǐlái

C. 请问 ，你从哪里来 — D. 请问 ， 我从哪里来

21. How do you say "Beijing is fun" in Chinese:

běijīngh ǎ owánma — běijīnghěnh ǎ owán

A. 北 京 好 玩 吗 — **B. 北 京 很 好 玩**

běijīngbùh ǎ owán — běijīnghěnh ǎ ochī

C. 北 京 不 好 玩 — D. 北 京 很 好 吃

22. How do you say "candied haws in Beijing is very delicious" in Chinese:

tánghú lu bùh ǎ ochī — tánghú lu hěnh ǎ ochī

A. 糖 葫芦不 好 吃 — **B. 糖 葫芦 很 好 吃**

tánghú lu hěnh ǎ owán — tánghú lu shìshénme

C. 糖 葫芦 很 好 玩 — D. 糖 葫芦是 什 么

23. How do you say "Is there a candied haws here?" in Chinese:

zhèl ǐ y ǒ utánghú lu ma — tánghú lu bùh ǎ ochī

A. 这 里 有 糖 葫芦吗 — B. 糖 葫芦不 好 吃

zhèl ǐ méiy ǒ utánghú lu — tánghú lu bùh ǎ okàn

C. 这 里 没 有 糖 葫芦 — D. 糖 葫芦不 好 看

24. Mingming is interested in the food of which place:

màng ǔ	dōngjīng	bā lí	ni ǔ yuē
A. 曼 谷	B. 东 京	C. 巴黎	D. 纽 约

25 Which city and Bangkok were mentioned in the conversation?

shànghǎ i	běijīng	gu ǎ ngzhōu	dōngjīng
A. 上 海	**B. 北 京**	C. 广 州	D. 东 京

26 Which city's food is Mingming more interested in?

běijīng	màng ǔ	dōngjīng	shànghǎ i
A. 北 京	B. 曼 谷	C. 东 京	D. 上 海

27 What topics were discussed during the conversation?

míng zì	jiāxiāng	shíwù	ài hào
A. 名 字	**B. 家 乡**	C. 食物	D. 爱好

28 How do you say "here" in Chinese?

zhèl ǐ	nàl ǐ	n ǎ l ǐ	dì fāng
A. 这 里	**B. 那里**	C. 哪 里	D. 地 方

29 How do you say "there" in Chinese?

zhèl ǐ	nàl ǐ	n ǎ l ǐ	dì fāng
A. 这 里	B. 那里	C. 哪 里	D. 地 方

30 How do you say "name" in Chinese?

xìngmíng	niánlíng
A. 姓 名	B. 年 龄
jiāxiāng	lái zì
C. 家 乡	D. 来自

APPENDIX C

IOC (Index of Item Objective Congruence)

IOC (Index of Item Objective Congruence)

Learning Management Plan though the traditional approach

for Primary 4 (Grade 4) students.

Research Instrument		Expert results					total	IOC	Result
		1	2	3	4	5			
Learning Management Plan using the traditional approach									
Unit 1	Hometown								
	1. Learning Objectives	1	1	1	1	1	5	1	yes
	2. Learning Subject Matter	1	1	1	1	1	5	1	yes
	3. Learning Media Resources	1	1	1	1	1	5	1	yes
	4. Teaching and Learning Activities	1	1	1	1	1	5	1	yes
	5. Measurement and Evaluation	1	1	1	1	1	5	1	yes
Unit 2	I'm from Beijing								
	1. Learning Objectives	1	1	1	1	1	5	1	yes
	2. Learning Subject Matter	1	1	1	1	1	5	1	yes
	3. Learning Media Resources	1	1	1	1	1	5	1	yes
	4. Teaching and Learning Activities	1	1	1	1	1	5	1	yes
	5. Measurement and Evaluation	1	1	1	1	1	5	1	yes

IOC (Index of Item Objective Congruence)

Learning Management Plan though game-based learning

for Primary 4 (Grade 4) students.

Research Instrument		Expert results					Total	IOC	Result
		1	2	3	4	5			
Learning Management Plan using the game-based learning									
Unit 1	Hometown								
	1. Learning Objectives	1	1	1	1	1	5	1	yes
	2. Learning Subject Matter	1	1	1	1	1	5	1	yes
	3. Learning Media Resources	1	1	1	1	1	5	1	yes
	4. Teaching and Learning Activities	1	1	1	1	1	5	1	yes
	5. Measurement and Evaluation	1	1	1	1	1	5	1	yes
Unit 2	I'm from Beijing								
	1. Learning Objectives	1	1	1	1	1	5	1	yes
	2. Learning Subject Matter	1	1	1	1	1	5	1	yes
	3. Learning Media Resources	1	1	1	1	1	5	1	yes
	4. Teaching and Learning Activities	1	1	1	1	1	5	1	yes
	5. Measurement and Evaluation	1	1	1	1	1	5	1	yes

IOC (Index of Item Objective Congruence)

Learning achievement test

Item test	Expert results					Total	IOC	Result
	1	2	3	4	5			
1	1	1	1	1	1	5	1	5
2	1	1	1	1	1	5	1	5
3	1	1	-1	1	1	3	0.6	3
4	1	1	1	1	1	5	1	5
5	1	1	1	1	1	5	1	5
6	1	1	1	1	1	5	1	5
7	1	1	1	1	1	5	1	5
8	1	1	1	1	1	5	1	5
9	1	1	0	1	1	4	0.8	4
10	1	1	1	1	1	5	1	5
11	1	1	1	1	1	5	1	5
12	1	1	1	1	1	5	1	5
13	1	1	1	1	1	5	1	5
14	1	1	1	1	1	5	1	5
15	1	1	0	1	1	4	0.8	4
16	1	1	1	1	1	5	1	5
17	1	1	1	1	1	5	1	5
18	1	1	1	1	1	5	1	5
19	1	1	1	1	1	5	1	5
20	1	1	1	1	1	5	1	5
21	1	1	0	1	1	4	0.8	4
22	1	1	1	1	1	5	1	5
23	1	1	1	1	1	5	1	5
24	1	1	1	1	1	5	1	5
25	1	1	1	1	1	5	1	5
26	1	1	1	1	1	5	1	5
27	1	1	1	1	1	5	1	5
28	1	1	-1	1	1	3	0.6	3
29	1	1	-1	1	1	3	0.6	3
30	1	1	1	1	1	5	1	5

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