



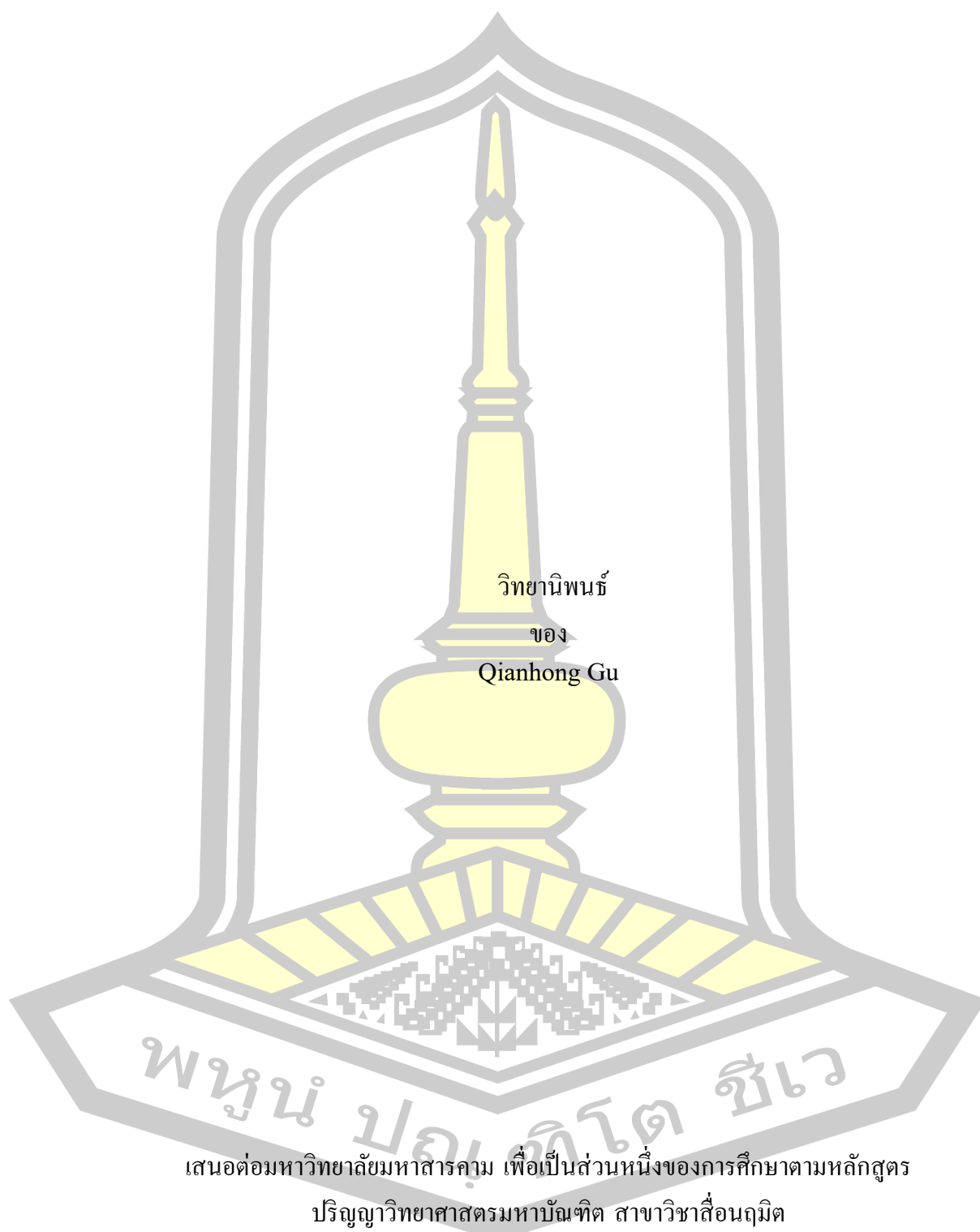
Micro Interactive Video to Learning the Meaning of Chinese Poetry for Primary
School Students in China

Qianhong Gu

A Thesis Submitted in Partial Fulfillment of Requirements for
degree of Master of Science in Creative Media

December 2024

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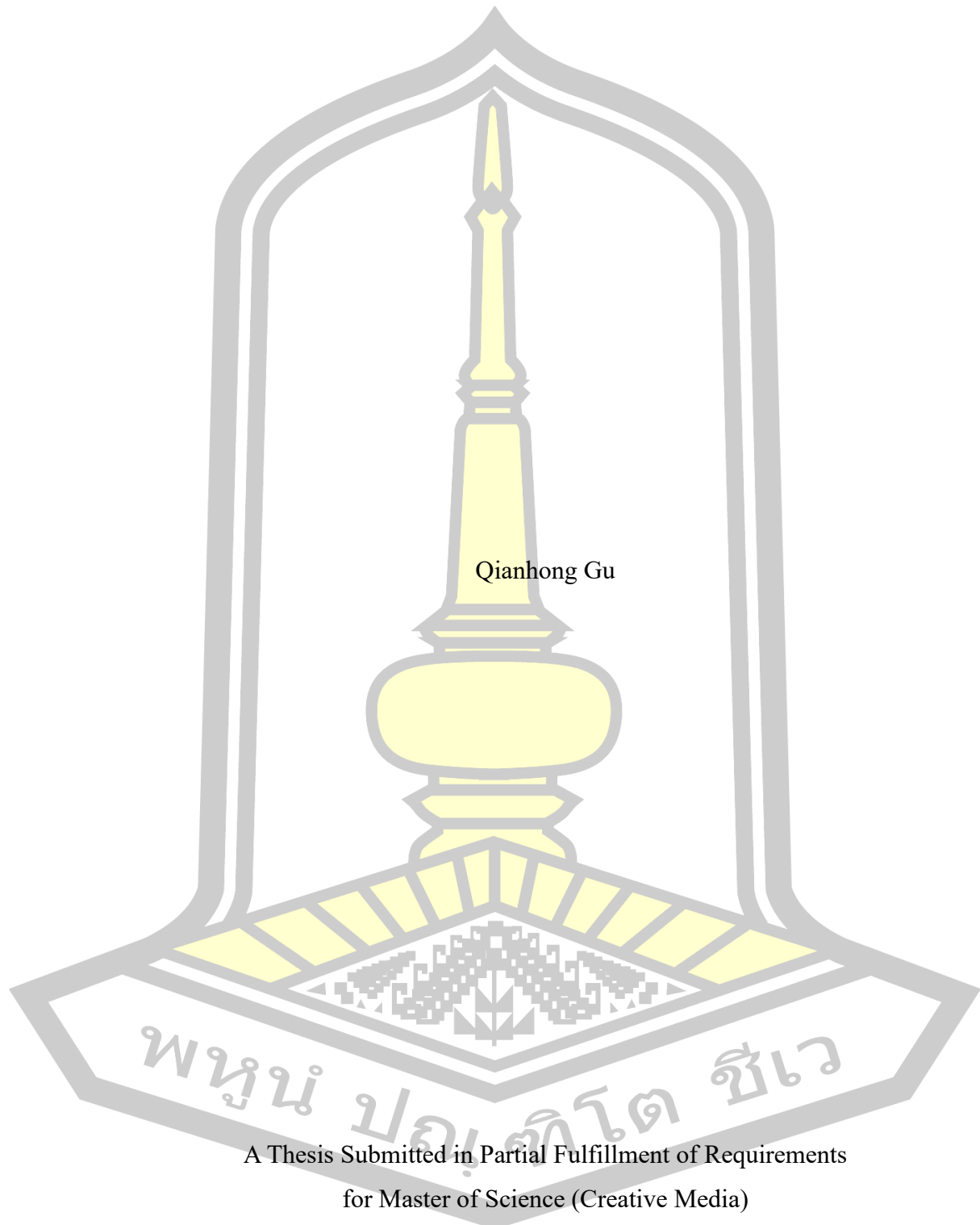


เสนอต่อมหาวิทยาลัยมหาสารคาม เพื่อเป็นส่วนหนึ่งของการศึกษาตามหลักสูตร
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ลิขสิทธิ์เป็นของมหาวิทยาลัยมหาสารคาม

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School Students in China



Qianhong Gu

A Thesis Submitted in Partial Fulfillment of Requirements
for Master of Science (Creative Media)

December 2024

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The examining committee has unanimously approved this Thesis, submitted by Ms. Qianhong Gu , as a partial fulfillment of the requirements for the Master of Science Creative Media at Mahasarakham University

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พหุบัณฑิต ชีวะ

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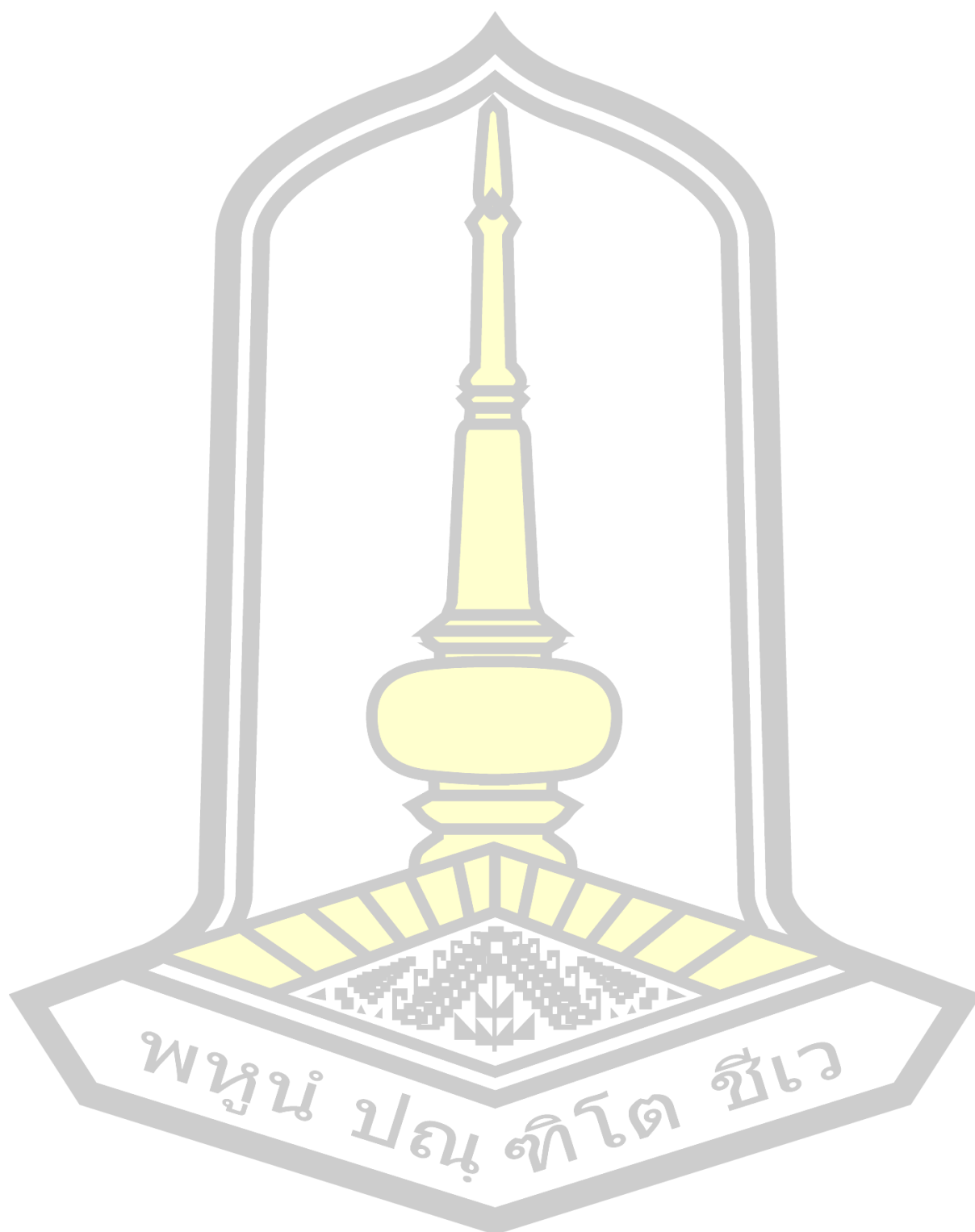
ABSTRACT

This research aimed to: 1) study the problem and need for micro-interactive videos to learn the meaning of Chinese poetry for primary school students in China; 2) develop micro-interactive videos for learning the meaning of Chinese poetry for primary school students in China; and 3) evaluate the learning of Chinese poetry meaning among elementary school students in China.

The sample for this study was divided into two groups: 1) 115 primary school students and 4 Chinese poetry teachers, selected through purposive sampling; and 2) The experimental group of 35 students, chosen through probability sampling by random from volunteers. The research tools included: 1) a survey on the problems and needs for micro-interactive videos to learn the meaning of Chinese poetry; 2) The interview guide for teachers about the issues and necessities of using micro-interactive videos for the same purpose; 3) an evaluation form for the quality of the micro-interactive videos; 4) a knowledge test on the meaning of Chinese poetry; and 5) a satisfaction questionnaire for the primary school students regarding the micro-interactive videos. Data were analyzed using descriptive statistics, including frequency, percentage, mean, standard deviation, and t-test statistics.

The findings revealed that: 1) The problems faced by primary school students in learning ancient poetry include difficulties in understanding the meaning of poetry, identifying complex vocabulary, and imagining emotions. Teachers pointed out that these problems are more prominent due to imperfect teaching methods and limited student experience. 73.56% of the respondents believed that it was necessary to use micro-interactive videos to assist learning, and all teachers (100%) supported this method to improve the learning effect of second-grade students. 2) The quality of the micro-interactive videos for learning the meaning of Chinese poetry was rated as good quality. 3) After using the micro-interactive videos, students' scores were significantly higher than before at the 0.05 significance level. 4) Chinese primary school students showed a satisfaction level of 93.06% of students believe that it can greatly deepen their understanding of the connotations of ancient poetry with the micro-interactive videos. Thus, micro-interactive videos can be effectively utilized for learning the meaning of Chinese poetry.

Keyword : Micro Interactive, Video, Learning, Poetry, Primary School, China



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I sincerely thanked the experts Xianyan Gu, Xiaochong Li and Xiaofang Gu for their kind assistance in evaluating the quality of the "Micro Interactive Video to Learning the Meaning of Chinese Poetry for Primary School Students in China." I also appreciated the teachers of ancient Chinese poetry for primary school students who provided valuable information for this research, and the second-grade primary school students in China who voluntarily participated in the interactive video trial. Their involvement ensured the smooth and successful completion of this research.

Above all, I was profoundly grateful to my parents and all benefactors for their unwavering encouragement and comprehensive support. I dedicated the value and benefits of this thesis to them. I sincerely hoped this research would be useful in promoting the use of "Micro Interactive Video to Learning the Meaning of Chinese Poetry for Primary School Students" in ways that align with students' interests and learning behaviors, benefiting anyone interested in this field.

Qianhong Gu

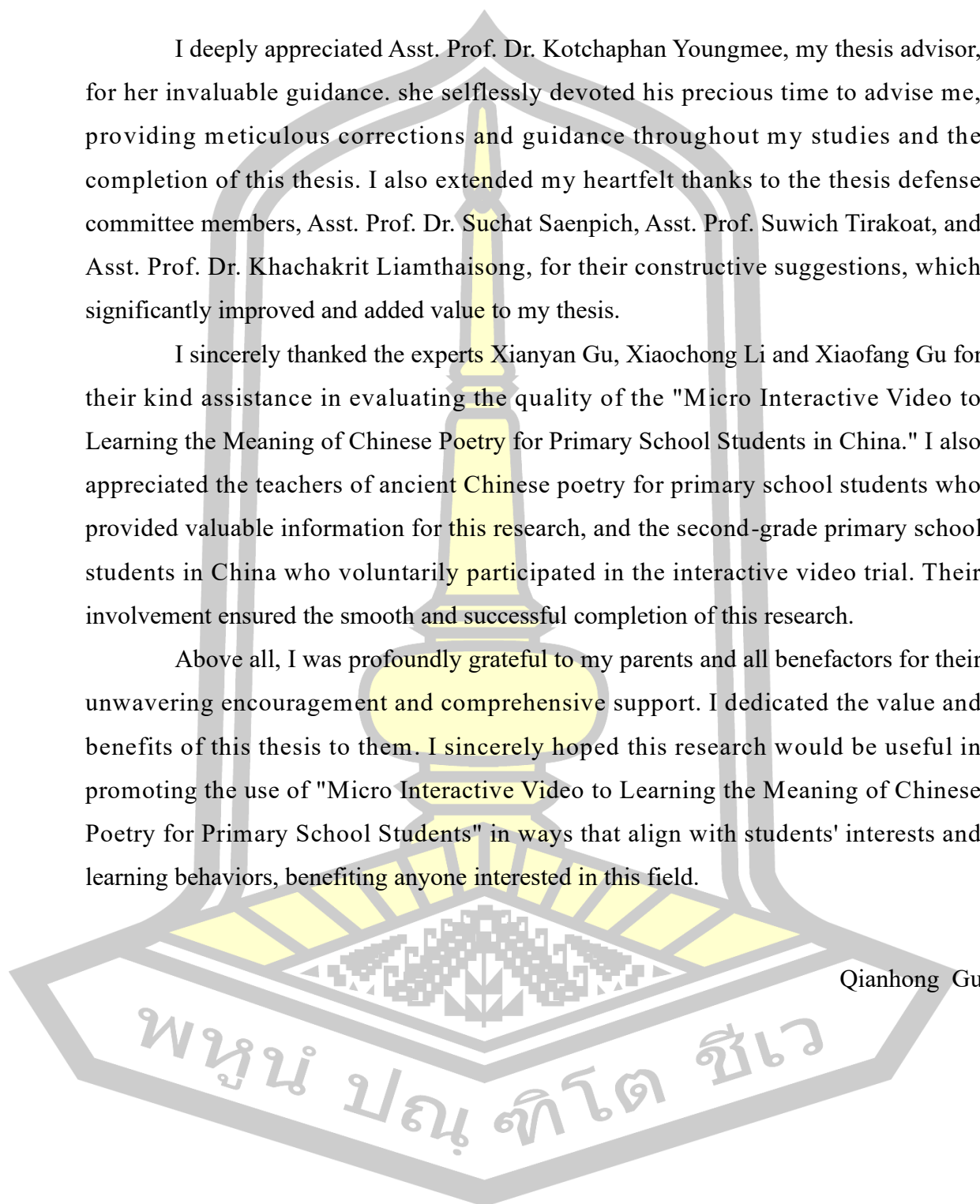


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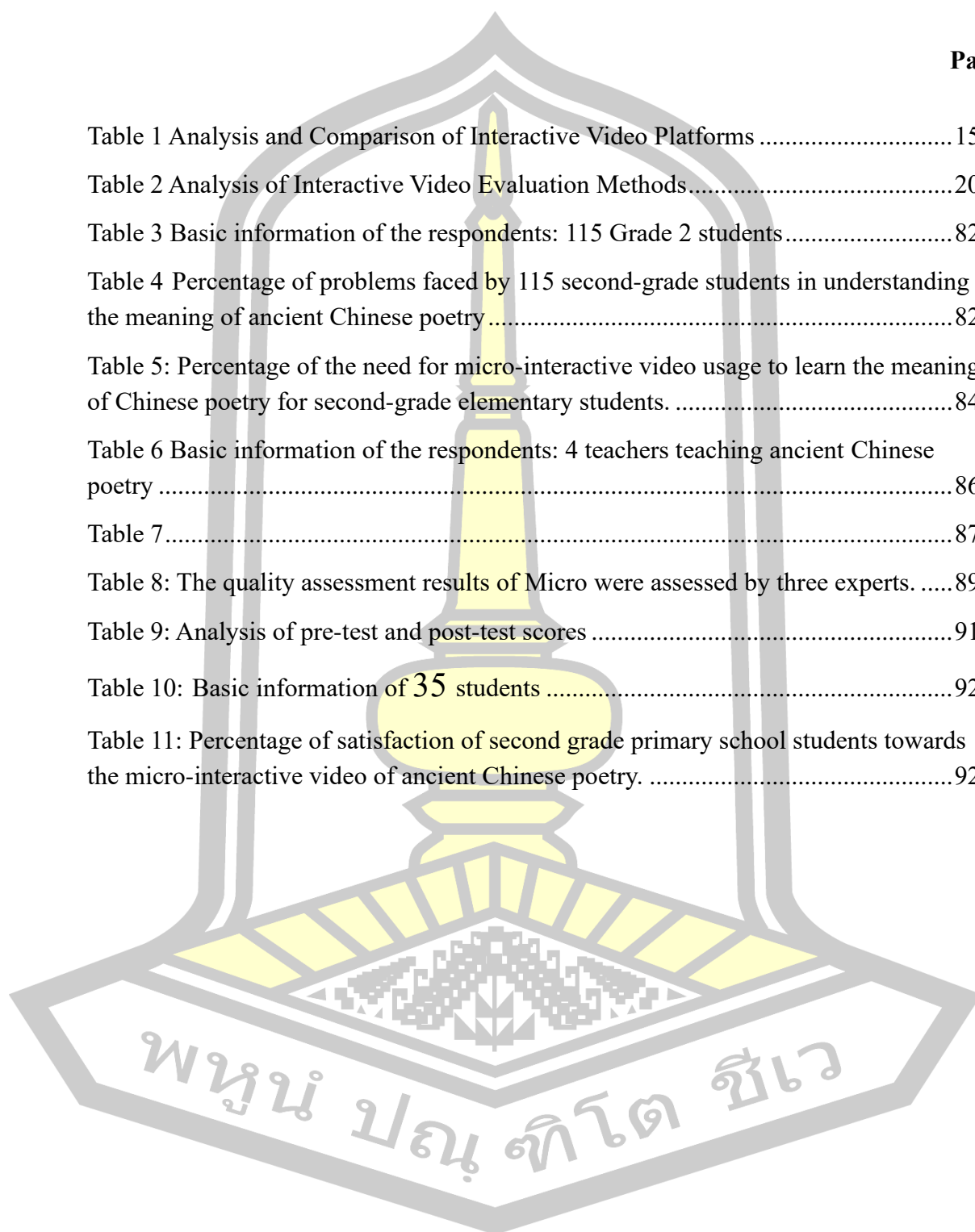
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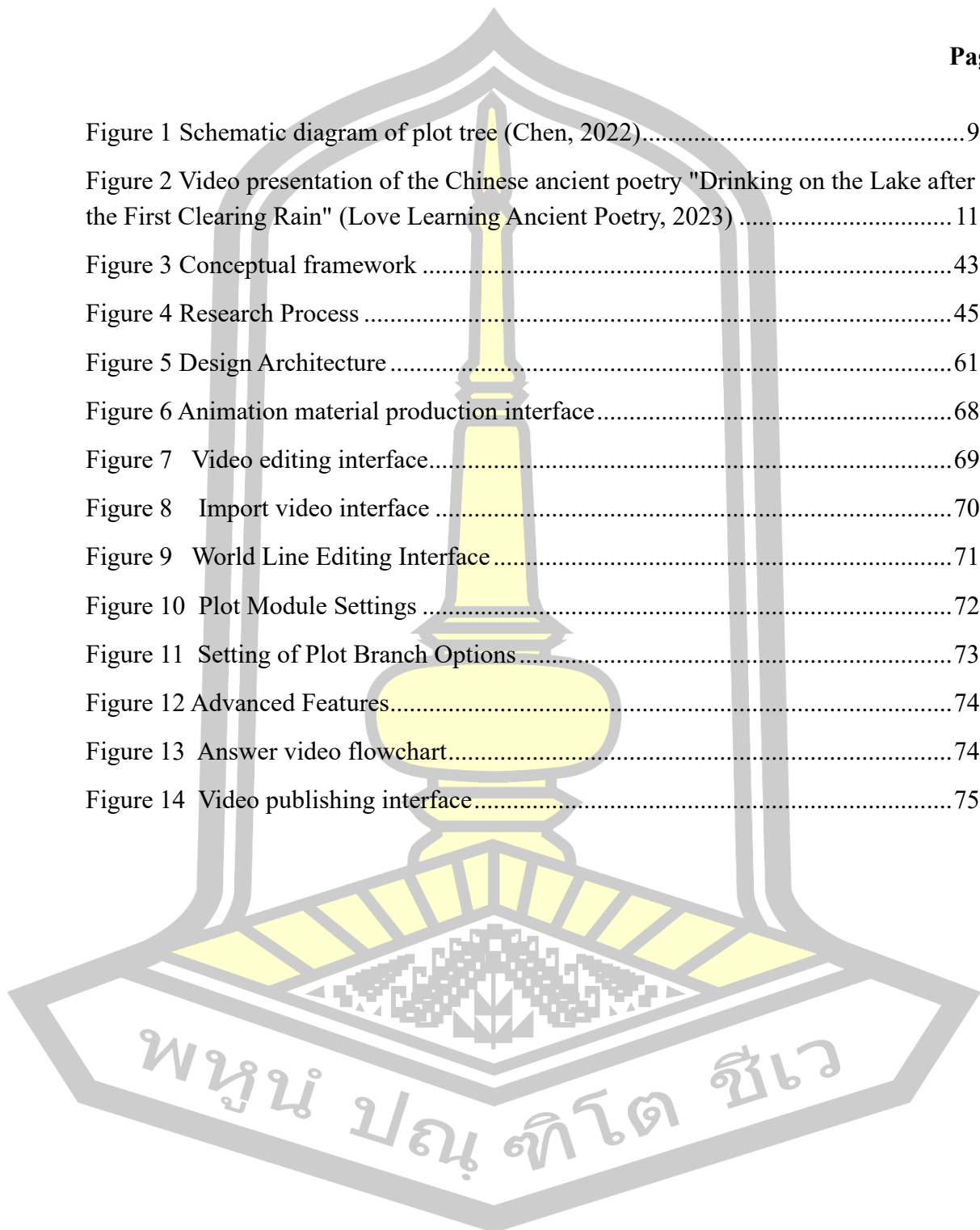
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Chapter 1

Introduction

1.1. Research Background

Classical Chinese poetry is the essence of traditional Chinese culture. By learning classical Chinese poetry, primary school students can better understand China's history, culture, and traditional values, and cultivate their love and sense of identity towards their motherland. Secondly, the beautiful language and profound artistic conception of ancient poetry can enhance students' language sense and aesthetic ability, cultivate their emotional expression ability and literary cultivation. In addition, by learning ancient poetry, primary school students can also exercise their memory and comprehension abilities, cultivate their thinking logic and expression skills.

Ancient Chinese poetry is an important component of Chinese literature, with a long history, rich content, and diverse forms. There are a large number of ancient Chinese poems throughout history, among which the "Complete Tang Poetry" contains about 49000 Tang poems, and the "Complete Song Ci" contains more than 21000 Song poems. The poetry works of other dynasties are also very rich, and the overall quantity is difficult to accurately count, but conservatively estimated to be in the hundreds of thousands. Starting from September 2017, the new "Ministry of Education Compiled Compulsory Education Textbook" (hereinafter referred to as the "Ministry Compiled Edition") will be uniformly adopted for Chinese language textbooks in primary and secondary schools nationwide. Among the 12 Chinese language books for the entire six grades of primary schools, there are about 132 ancient poems and writings, with an average of about 20 poems and writings per grade. Compared with the previous People's Education Press, the increase in ancient poems and writings for the six grades of primary schools is as high as 80% (Hua, 2017). This quantity has significantly increased compared to previous versions of primary school Chinese textbooks. (Office of the Ministry of Education, 2024). This reflects the importance of ancient Chinese poetry (hereinafter referred to as ancient poetry).

Ancient poetry uses a variety of expression techniques in writing. The language implicitly reflects the social style at that time. As the essence of Chinese classical literature, ancient poetry is full of the poet's rich imagination and thoughts and feelings. At present, the main purpose of Chinese primary school students to learn ancient poetry is to take an exam. They attach great importance to the memorization and accurate memory of ancient poetry, but underestimate the understanding of the connotation of ancient poetry. (Zhang, 2019) Although students can proficiently recite ancient poetry, their complex language and historical background make it difficult for elementary school students with limited basic knowledge, life experience, and incomplete knowledge structure to understand some difficult words and phrases, and cannot deeply feel the profound cultural connotations and emotional support of ancient poetry. Difficult to arouse students' interest in learning ancient poetry.

Ancient Chinese poetry carries rich cultural heritage and plays an important role in shaping values and understanding Chinese traditions. The Ministry of Education issued the "Guidelines for Improving the Education of Excellent Traditional Chinese Culture" in 2014, emphasizing the need to enhance students' awareness of inheriting excellent traditional Chinese culture. Due to the fundamental and enlightening nature of primary school curriculum, the primary school stage is a key link in traditional culture education. In recent years, the number of ancient poems in primary school textbooks has been increasing year by year. The new curriculum standard requires the teaching of ancient poems in primary schools to "recite ancient poems, pay attention to accumulation, perception, and application, and improve one's appreciation taste. (Han, 2018) It can be seen that ancient poetry is an important carrier of traditional Chinese culture, and teaching ancient poetry in primary school is a crucial part of the process of reviving traditional culture. Therefore, research on teaching ancient Chinese poetry in primary schools is particularly crucial in promoting students' understanding, appreciation, and interest in learning ancient Chinese poetry.

Interactive Video is a new type of video that aims to provide viewers with a richer viewing experience through enhanced sensory feedback, plot engagement, content exploration, and other means. (AIQIYI, 2019) Since the popularization of mobile Internet, interactive video technology has gradually emerged. From the early embryonic stage to the current rapid development period, it has shown great potential

in film, television, entertainment, education and other fields, and has become an important force to promote digital content innovation by virtue of its short, interactive and other characteristics. Both domestic and foreign video platforms have launched interactive video products, and with the continuous advancement of technology, the production and dissemination of interactive videos have become increasingly mature, bringing users a more personalized and immersive experience.

The teaching of poetry in primary school Chinese is in line with the ancient concept of "poetry education". Advocating children to learn more poetry, which was called "cultivating virtue" and "getting the right temperament" in ancient times, is to educate people with ancient ethics and morality. Today, advocating children to read ancient poetry is also aimed at continuing excellent traditional culture and cultivating moral character through poetry recitation. The study of ancient poetry is the initial stage for primary school students to learn Chinese literature. At this stage, learning ancient poetry can showcase excellent traditional Chinese culture to primary school students, promote their understanding of the profoundness of excellent traditional Chinese culture, lay the foundation for their love for Chinese culture, establish cultural confidence, and consciously inherit excellent traditional Chinese culture in daily learning, promote and cultivate national spirit. Therefore, the author attempts to combine emerging interactive video technology with the teaching of primary school ancient poetry courses, exploring the benefits, challenges, and best practices of applying micro interactive video technology to primary school ancient poetry courses, in order to improve teaching effectiveness and explore more possibilities for information-based curriculum construction.

1.2 Research questions

1.2.1 What are the specific problems and needs of Chinese elementary school students in using micro interactive videos to learn the meanings of ancient poetry?

1.2.2 How to effectively develop micro interactive videos to promote Chinese elementary school students' learning of the meaning of Chinese poetry?

1.2.3 How effective are micro interactive videos in improving Chinese elementary school students' understanding of the meaning of Chinese poetry?

1.2.4 How satisfied will Chinese elementary school students be after using micro-interactive videos to learn the meaning of Chinese poetry?

1.3 Research objective

1.3.1 Research on the Problems and Necessity of Chinese Primary School Students Learning the Meaning of Ancient Poetry through "Micro Interactive Videos"

1.3.2 Develop micro interactive videos for Chinese elementary school students to learn the meaning of ancient poetry

1.3.3 Comparison of pre-test and post-test learning outcomes of Chinese primary school students in their understanding of the semantics of Chinese poetry.

1.3.4 Evaluate the learner's satisfaction with the interactive micro-videos designed for learning the meaning of Chinese poetry.

1.4 Definition of Terms

1.4.1 Micro interactive videos

Micro interactive video, in short, refers to micro content carried by interactive videos. As there is currently no research that provides a detailed definition of this term, this study attempts to define the "micro interactive video" proposed in this study based on research on "micro content" and "interactive video".

The micro-interactive video produced in this study is a teaching tool with micro-interactive characteristics. The video is based on the Chinese classical poem "Looking at the Waterfall at Mount Lu" and is 5-10 minutes long. The video integrates interactive functions such as visual exploration and branch options. This micro-interactive video is short and sharp, vivid and interesting, and highly interactive. It is suitable for primary school students to learn course content and facilitate learners to use and understand the meaning of ancient poems.

1.4.2 Ancient Chinese Poetry

The ancient poems studied in this paper mainly refer to the ancient poems in the textbooks compiled by the primary school Chinese department. According to the current Chinese version of the second grade primary school Chinese ancient poetry, the main features of the text are mainly composed of quatrains that describe scenery and express emotions, and praise nature. The ancient poetry selected for this study,

'The Waterfall in Mount Lu Viewed from Afar', depicts the scenery of the waterfall on Mount Lu, which is in line with the characteristic of second grade ancient poetry textbooks that focus on describing scenery and expressing emotions. Therefore, the teaching of this poem was chosen as the design for the interactive video content.

1.4.3 Learning

The learning in this study refers to 35 second grade students from Longyi Primary School in Zhengzhou City, Henan Province, China. Through watching and interacting with micro interactive videos, they learn to perceive the rhythm of reading ancient poetry, understand the meaning of key words in ancient poetry, and thus comprehend the poetic essence of ancient poetry. Understand the metaphorical and exaggerated rhetorical devices in ancient Chinese poetry. Guide students to connect with real-life situations, activate their imagination to feel poetic sentiments, comprehend poetic emotions, and understand the images described in ancient poetry.

1.4.4 Academic performance

The academic performance in this study refers to the test scores of students before and after learning ancient poems through micro-interactive videos.

1.5 Research Scope

1.5.1 Sample Group: The study focuses on 2nd-grade primary school students, specifically those studying Chinese poetry, at Longyi School in Zhengzhou, Henan Province, China. The total sample consists of 115 students across 4 classes. A simple random sampling method was employed, where one class of 35 students was selected as the experimental group.

1.5.2 Content Focus: This research examines the effectiveness of micro-interactive videos in enhancing the understanding of the Chinese poem "The Lushan Waterfall"

1.5.3 Research Location: The study is conducted at Longyi School in Zhengzhou, Henan Province, China.

1.5.4 Research Media: Micro-interactive videos are utilized as the educational tool in this study.

1.5.5 Learning Outcomes: The study measures students' comprehension, retention, and engagement with the Chinese poem before and after the introduction of micro-interactive videos.

1.5.6 Satisfaction and Feedback: The research assesses students' satisfaction with the use of micro-interactive videos as a learning tool.

1.5.7 Research Time Frame: The study spans 2 semesters or 1 academic year to evaluate the impact over time.

1.5.8 Evaluation Methods: Both qualitative and quantitative data collection methods are used, including interviews, questionnaires, and tests, to gather comprehensive data.

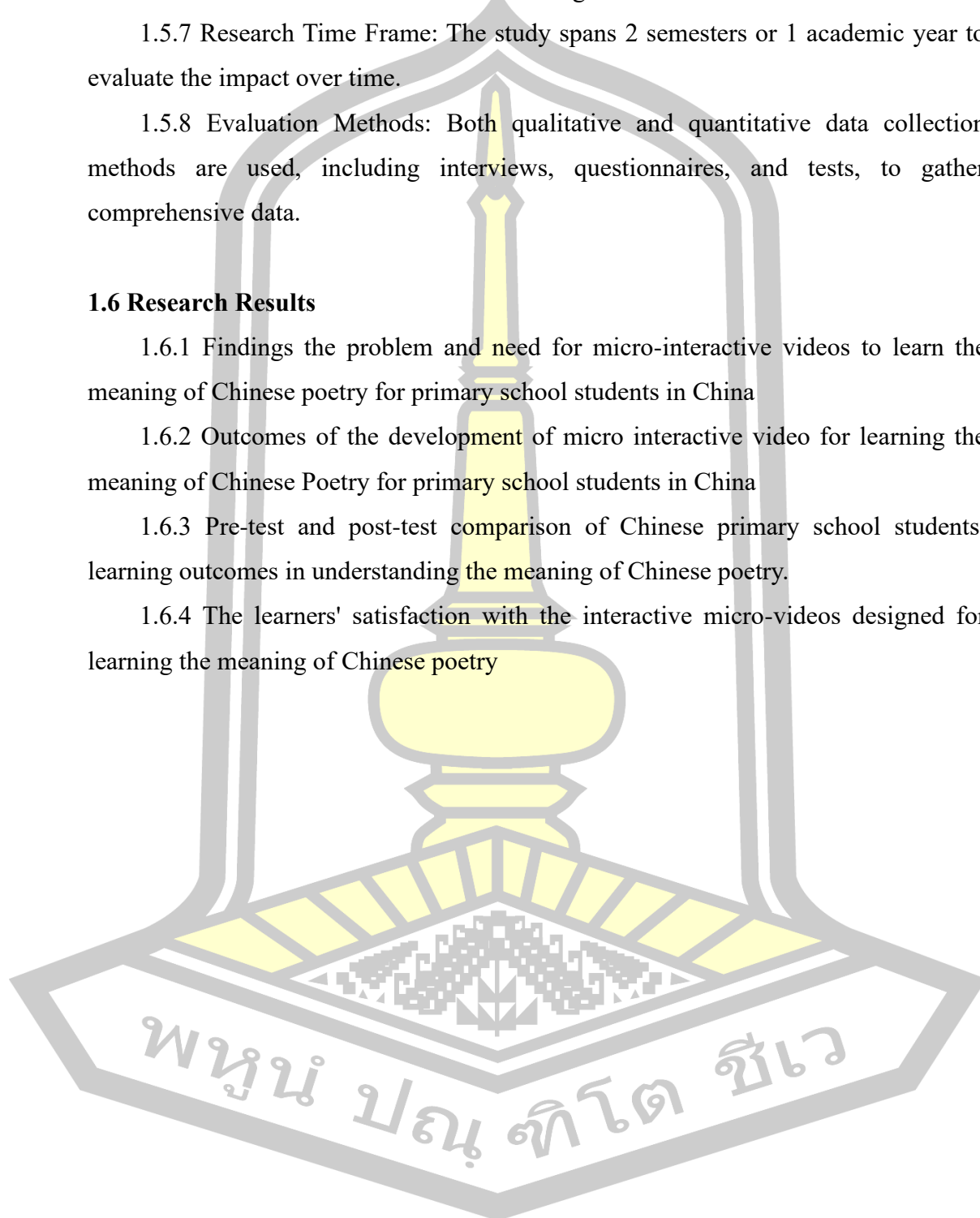
1.6 Research Results

1.6.1 Findings the problem and need for micro-interactive videos to learn the meaning of Chinese poetry for primary school students in China

1.6.2 Outcomes of the development of micro interactive video for learning the meaning of Chinese Poetry for primary school students in China

1.6.3 Pre-test and post-test comparison of Chinese primary school students' learning outcomes in understanding the meaning of Chinese poetry.

1.6.4 The learners' satisfaction with the interactive micro-videos designed for learning the meaning of Chinese poetry



Chapter 2

Literature Review

2.1 Micro Interactive Video

Micro interactive video is a form of video that combines both micro and interactive features. It is usually a video content presented in a short period of time, with a length typically ranging from a few minutes to over ten minutes. Micro interactive videos not only have the characteristics of being vivid and interesting, but also involve various interactive elements such as multiple-choice questions, fill in the blank questions, and analysis questions, allowing viewers to participate in the video content and improve learning effectiveness and experience. Compared with traditional video teaching, micro interactive videos are more participatory and interactive, which can enhance students' interest in learning, stimulate learning motivation, and help improve learning outcomes.

2.1.1 Meaning of Micro Interactive Videos

Micro interactive video, in short, refers to micro content carried by interactive videos. As there is currently no research that provides a detailed definition of this term, this study attempts to define the "micro interactive video" proposed in this study based on research on "micro content" and "interactive video".

Micro content design is a teaching strategy that presents knowledge content in a concise and highly focused form, tailored to the needs of learners. It provides learners with convenient, efficient, and personalized learning experiences through modern information technology means. The core concept of micro content is to modularize teaching content into relatively independent, structurally clear, and goal oriented learning units (Brown, 2001). This design method helps to improve teaching effectiveness, enhance learners' learning motivation and self-directed learning ability (Kim&Bonk, 2006). Micro content design based on learners' needs and characteristics can achieve precise matching of teaching content, thereby improving learners' learning outcomes (Liyana Gunawardena et al., 2013). In addition, micro content can promote the sharing and reuse of educational resources (Siemens&Baker, 2006), which helps to advance the process of educational informatization. The characteristics of micro content include: short and concise, focused content, and diverse forms.

Interactive video is a form of video that combines multimedia technology and interactive design concepts, allowing users to interact in real-time with video content while watching. The emergence of interactive videos has fundamentally changed the traditional one-way video viewing method. Users are no longer passive recipients, but can actively participate in it, affecting the playback process and results of videos. In May 2019, iQiyi released the world's first Interactive Video Guideline (IVG), which clarifies that "interactive video is a new type of video aimed at providing viewers with a richer viewing experience through enhanced sensory feedback, plot participation, content exploration, and other means. In the 2020 White Paper on Interactive Video Technology released by the State Administration of Radio, Film and Television (Sun, 2019), it was pointed out that interactive video refers to a content interactive video service that supports time domain interaction, spatial domain interaction, and event based interaction based on "non-linear video" content. This service has interactive capabilities such as branching plot selection, perspective switching, and visual interaction, which can bring users a strong sense of participation and immersion in interactive viewing experience. (The National Radio and Television Administration of China, 2020)

After the above analysis, the "micro interactive video" proposed in this study refers to a teaching resource that uses video as a carrier, triggers interactive options as an interactive form, and focuses on explaining a certain knowledge point or unfolding a certain teaching process as the goal. The main purpose of this study is to develop and apply micro interactive videos of ancient Chinese poetry. Therefore, if the knowledge points and trigger options involved are related to ancient Chinese poetry, this micro interactive video is called an ancient Chinese poetry micro interactive video.

2.1.2 Benefits of Micro Interactive Video

Micro interactive videos use interactive videos as a carrier and also possess the characteristics of interactive videos. Based on the characteristics of integrated micro content and interactive videos in the context of teaching ancient Chinese poetry, the following advantages can be summarized:

- 1) Helps to increase students' participation and motivation

By providing interactive and visually stimulating micro content, we aim to enhance students' engagement and motivation. The ancient Chinese used in ancient poetry is different from the modern Chinese that students usually use, and there are differences in language structure between the two. Therefore, primary school students may have difficulties in understanding the words, phrases, and content of poetry, feeling that learning ancient poetry is boring and boring, which reduces their enthusiasm for learning ancient poetry. Teachers use micro interactive videos as a teaching method, using pictures, animations, and music to stimulate students' senses, transforming dull textual descriptions into vivid and interesting dynamic images. Micro interactive videos help students create a poetic atmosphere, allowing them to immerse themselves in the audio and visual atmosphere brought by the video, form a friendly perception of abstract language and text, naturally grasp the relevant knowledge content of poetry, and thus enhance students' participation and enthusiasm in learning ancient poetry.

Chen (2022) used the interactive video plot branch (Figure 2-1) function of Bilibili software to create physics classes, and conducted a comprehensive analysis of the practical effects of applying interactive micro content to middle school physics teaching. Research has shown that interactive micro content can effectively stimulate students' interest in learning, achieve personalized learning methods, provide high-quality physics learning resources for students, and develop their self-directed learning abilities, enabling students to better improve their learning outcomes through the use of interactive micro courses.



Figure 1 Schematic diagram of plot tree (Chen, 2022)

2) Helps improve classroom teaching efficiency

Interactive videos promote active learning, allowing students to explore Chinese poetry at their own pace and receive immediate feedback, thereby deepening understanding and improving learning outcomes. The difficulty of learning ancient poetry is relatively high. Teachers need sufficient time to guide and explain ancient poetry teaching, so that students can fully grasp the relevant knowledge content of poetry. However, it is difficult for students to fully grasp the knowledge points only through in class time, and there is a lack of corresponding guidance outside of class, so the teaching effect is not good. The duration of micro interactive videos is generally short, and teachers can condense a certain key knowledge into this short video for sufficient explanation. The time is short and it has real-time interactivity, which is easy to attract and maintain students' attention, smoothly break through difficult learning tasks, and improve classroom teaching efficiency. In addition, teachers can push videos to students, who can use their spare time to preview and review, continuously promote learning activities, break space limitations, and improve classroom learning efficiency.

3) Helps enhance students' understanding of poetry and literature

Chinese ancient poetry has the characteristics of rich meaning and concise language, so some students have obstacles in understanding ancient poetry. Therefore, interactive elements are added to the classroom teaching of ancient poetry, using the visuals and audio provided by micro videos to present difficult to understand ancient poetry in the form of dynamic videos, enhancing students' understanding of poetry. For example, when teaching the third grade poem "Drinking on the Lake after the First Clear Rain", the teacher used a micro video to present the dynamic beauty of the rippling water in the clear sun of West Lake and the hazy beauty of the mountain scenery in the rain to the students, making the concise poem full of dynamic imagery. Teachers design this new model through micro interactive video content, allowing students to experience the beauty of the changing scenery of West Lake through vivid audio and visual atmosphere, enhancing their understanding of classical poetry. (Figure 2)



Figure 2 Video presentation of the Chinese ancient poetry "Drinking on the Lake after the First Clearing Rain" (Love Learning Ancient Poetry, 2023)

4) Beneficial for better understanding and retention

Micro interactive video design helps to break down complex poetic elements into manageable units for better understanding and retention. Scholars Zhang Yuanyuan and Liu E used the ancient poem "Spring Hope" as an example to develop a series of micro contents, including pre class preview, new lesson introduction, knowledge understanding, consolidation and practice, and summary and expansion, which were applied in three teaching stages: pre class, in class, and after class. Before class, students can watch the teacher's pre made micro lessons multiple times and repeatedly, quickly and efficiently review and consolidate old knowledge, learn new knowledge, until they fully understand and master the relevant knowledge. Using micro content to help students overcome comprehension barriers caused by insufficient knowledge reserves. In class, use micro content design to help students understand the content of the text and appreciate the author's thoughts and emotions by grasping key words. After class, use micro content to carry out targeted consolidation and supplementary exercises to effectively consolidate and review knowledge points. This splitting method not only conforms to the cognitive habits of primary school students, but also helps to improve learning efficiency.

In short, the application of micro interactive videos in Chinese poetry education has significant advantages. By combining the two, it can make it easier for students to understand the connotations of ancient Chinese poetry, increase their interest and participation in learning, achieve personalized teaching, and promote the healthy development of poetry education. However, in practical applications, further

exploration is needed to determine the optimal combination of micro content design and interactive videos in order to achieve better teaching outcomes.

2.1.3 Types of Micro Interactive Videos

1) Educational Micro Interactive Video

Educational micro interactive videos enhance learners' engagement and learning outcomes by incorporating interactive elements. For example, Chen&Wu (2018) studied the impact of interactive videos on learning achievement and found that this approach can significantly improve students' learning performance. Mayer (2017) further pointed out that the combination of multimedia and interactive videos can optimize the effectiveness of e-learning.

2) Entertainment Micro Interactive Video

Entertainment micro interactive videos provide viewers with an immersive entertainment experience through branching narrative and user selection. Zheng&Liu (2019) reviewed the interactive narrative mechanisms in video games and explored the ways in which players interact with stories. O'Flynn (2020) explores the ethical issues of interactive films, particularly the moral choices in branching narratives.

3) Advertising Micro Interactive Video

Advertising micro interactive videos enhance user engagement and improve brand perception through interactive forms. Yang&Xie (2020) pointed out that interactive video advertising has opened a new era of digital marketing, enhancing advertising effectiveness through user interaction. Sundar&Kim (2019) studied the role of interaction in online advertising and found that it can enhance user engagement and brand.

4) Training Micro Interactive Video

Micro interactive training videos have shown excellent performance in enhancing the effectiveness of workplace training. Park&Park (2021) found through a case study in the automotive industry that interactive videos can significantly enhance training effectiveness in the workplace. Sitzmann (2019) emphasizes that interactive learning environments can improve employees' learning efficiency and work performance.

2.1.4 Components of Micro Interactive Video

1) Content Design

Content design is the core of micro interactive videos. Existing research suggests that content design needs to be adjusted based on the audience's learning needs, age, and cultural background. For example, content design for elementary school students will pay more attention to simple, easy to understand, and entertaining ways of expression. Researchers point out that the selection of content should align with educational goals and match learners' cognitive abilities. The content design methods of different disciplines also vary, for example, the content design of Chinese and mathematics may have significant differences in expression and interactivity (Li&Zhang, 2019).

2) Interactive elements

Interactive elements are key factors in enhancing learning engagement in micro interactive videos. Interactive elements include click selection, drag and drop, quiz questions, etc. in the video. These elements enable learners to actively participate in learning activities while watching videos, rather than passively receiving information. The higher the interactivity of the video, the better it can maintain learners' attention and achieve better results in mastering knowledge points (Smith&Brown, 2020).

There are many forms of interactive videos that need to be designed according to the learning content. In specific design, we can choose interactive forms such as branch selection, interactive answering, and screen exploration. Set corresponding visual effects, sound effects, and incentive feedback forms for different functions

3) Visual Design

Animation and visual design enhance the learning experience through vivid visuals and animations. Research suggests that visual design should meet the aesthetic needs of learners and be closely integrated with teaching content. The complexity of visual design should match the age and cognitive abilities of learners, for example, young learners are more likely to accept designs with bright colors and lively animation styles (Jones&Miller, 2021).

4) Sound Effects and Narration

The role of sound effects and dubbing in interactive videos cannot be ignored. Research has found that appropriate sound effects and dubbing can effectively enhance the emotional appeal of content and help learners better understand and remember video content. Sound effects and dubbing should be consistent with the

video content, avoiding excessive exaggeration or inappropriate sound effects that interfere with learning (Chen&Li, 2022).

5) Branching Structure

The branching structure allows learners to explore different learning paths based on their personal choices, adding personalized and customized features to interactive videos. This non-linear learning approach helps to meet the personalized needs of different learners and can increase learners' sense of control over the learning process, thereby enhancing learning motivation (Davis&Thompson, 2019). Figure 3

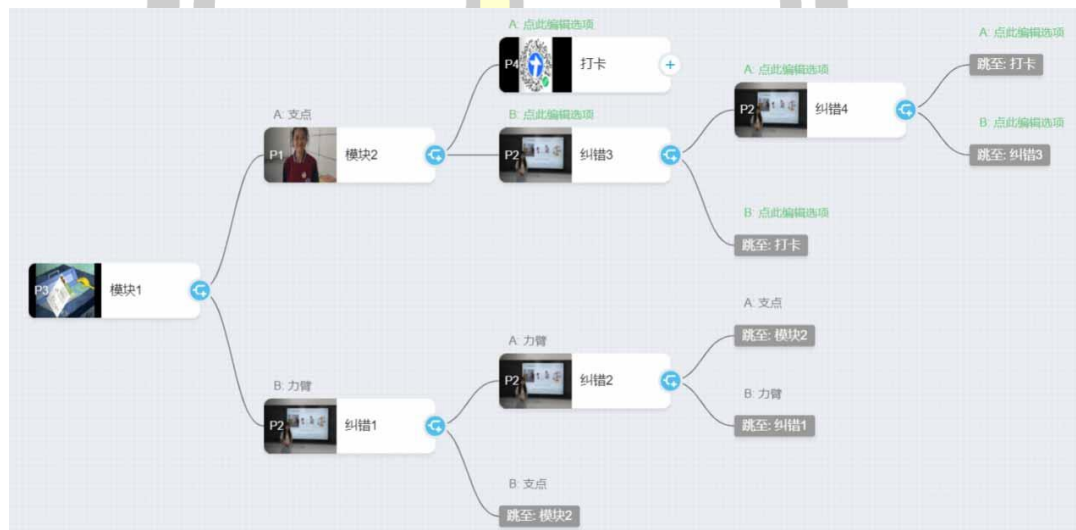


Figure 2.3 Interactive Video Plot Branch (Chen Meng, 2022)

6) Feedback mechanism

The feedback mechanism plays a crucial role in the learning process. Instant feedback can help learners correct errors in a timely manner and consolidate their learned knowledge. Research has shown that effective feedback mechanisms can not only improve learners' learning outcomes, but also enhance their confidence and sense of participation (Green&White, 2020).

7) Data Analysis and Tracking

The data analysis and tracking functions enable micro interactive videos to record and analyze learners' behavior and performance. These data can help teachers adjust their teaching strategies and provide personalized learning recommendations. The accuracy and real-time performance of data analysis are key to enhancing personalized learning experiences (Liu&Zhao, 2021).

8) Platform and Technical Support

The successful implementation of micro interactive videos relies on strong technical support. Choosing the appropriate platform and technology can ensure smooth video playback and a good interactive experience. In recent years, with the advancement of technology, more and more educational platforms have begun to support the development and application of micro interactive videos (Wang&Zhang, 2022).

Analyzing the existing interactive videos on the market can help choose the publishing platform for Chinese ancient poetry interactive videos. After comparing the mainstream interactive video production and publishing platforms in China, a brief overview was provided:

Table 1 Analysis and Comparison of Interactive Video Platforms

Interactive video production and publishing platform	iQIYI	Tencent Video	Bilibili	Youku
characteristic	IQiyi has launched an interactive video production plugin IVP, aimed at achieving "zero threshold" editing of interactive videos. It provides interactive components such as	Tencent Video has released interactive video technology standards and launched an open platform for one-stop interactive videos. This platform provides a series of guidelines from the concept of	Bilibili has launched the "Interactive Video" function, allowing UP creators to create interactive videos with different options. Users can make choices through the player, triggering multiple storylines and endings. Bilibili also provides bonus incentives	Youku has launched an interactive content platform and released standards for interactive video creation and interactive content technology. Youku has also provided a 1 billion yuan creative fund to encourage

	<p>branching plot, character switching, and visual information exploration, helping creators achieve rich storylines. IQiyi has also released the "White Paper on Interactive Video Advertising" to standardize the creation and placement of interactive video advertisements.</p>	<p>interactive videos to the creative process and the usage process of interactive video platforms.</p>	<p>for interactive video creators.</p>	<p>excellent content providers to collaborate with Youku.</p>
<p>advantage</p>	<p>IQiyi's interactive video platform provides one-stop interactive content production, creation, publishing, and data monitoring services. The</p>	<p>Tencent Video's interactive video platform supports creators and developers to achieve one-stop production of interactive</p>	<p>The interactive video function of Bilibili has strong representativeness in terms of user participation, and the platform's young user group has a high acceptance and enthusiasm for interactive</p>	<p>Youku's interactive content platform aims to create a comprehensive and user-friendly platform for creating interactive content,</p>

	platform also provides interactive video standards to help creators create interactive videos conveniently and efficiently.	content through the platform, while providing universal interactive components and creation platforms, as well as APIs and services, to help creators achieve more interactive functions and gameplay.	content. The interactive video function of Bilibili also supports viewing on web computers and mobile devices.	combined with the resources of Alibaba Entertainment, to provide timely payment and diversified revenue methods for interactive content creators.
disadvantage	Interactive video content may require higher copyright investment, increasing costs.	For video creators, a certain level of technical background may be required to fully utilize the tools provided by the platform. The content ecosystem of	The interactive video feature is relatively new and may not be as comprehensive in terms of functionality and technical support as other mature platforms. As a platform starting from anime culture, it may	The market performance and user base in the field of interactive video may not be as good as other platforms. The technology and content ecosystem of interactive videos may

		interactive videos is still developing and may take time to improve.	have more advantages in some types of interactive video content, but it may need more exploration in other fields.	need further development and improvement.
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Through the comparison in Table 2-1, it is found that the "Bilibili" platform is more suitable for teachers to teach and for students to learn as an interactive teaching platform. This platform not only has low registration requirements and is completely free, but also is easy to operate and convenient for students to access resources. It is also more practical and suitable for teachers with limited resources.

2.1.5 Steps in Producing Micro Interactive Video

1) **Identifying Goals and Audiences:** The production of interactive videos also requires clear goals and audiences. Determine the educational purpose, content scope, and interactive format of the video, and analyze the audience's age, interests, and technical level.

Script and Storyboard Development: The production of interactive videos begins with script writing and storyboard design. The script should clearly specify the content and interactive elements in each scenario, ensuring that the transmission of information and the design of interaction are closely integrated. Storyboard presents the content structure and interactive process of the video in visual form.

2) **Design interactive elements:** Based on the script, design interactive elements such as multiple-choice questions, drag and drop tasks, clicking on hotspots, etc. The design of interactive elements needs to be simple and easy to understand, and able to effectively help learners understand and consolidate knowledge.

3) **Multimedia material production:** Produce the required multimedia materials, including videos, animations, audio, and graphics. The material should be attractive and coordinated with the interactive content. During the production process, technical

limitations should be considered to ensure that the video can be played smoothly on multiple devices.

4) Programming and integration: Integrating interactive design elements and multimedia materials into a complete video. This usually requires the use of specialized interactive video production tools or programming techniques. The various interactive nodes of the video need to undergo detailed testing to ensure that they can work properly in different situations.

5) Testing and optimization: After the video production is completed, multiple rounds of testing are conducted to ensure smooth user experience and effective interaction. Adjust the video based on test feedback to optimize user interaction experience and content presentation.

6) Publishing and Monitoring: Publish the final video on a suitable platform and monitor its usage and interactive effects through data analysis tools. Based on audience feedback and data analysis results, continuously improve the design of interactive videos.

2.1.6 Steps in Evaluating the Outcomes of Micro Interactive Video

The evaluation of micro interactive videos is the final stage of the entire development process. Its core lies in real-time induction and reflection on the problems that arise during the implementation of videos, and then continuous improvement, in order to achieve the best teaching effect.

This study analyzed and researched a series of evaluation methods proposed by existing researchers, and ultimately developed a result evaluation step applicable to micro interactive videos of ancient Chinese poetry.

1) Research on Interactive Video Evaluation Methods

With the development of digital technology and the rise of online short videos, interactive videos have gradually become a research hotspot. In order to evaluate the effectiveness of interactive videos, researchers have proposed a series of evaluation methods. The analysis of specific evaluation methods for interactive videos is shown in Table 2

Table 2 Analysis of Interactive Video Evaluation Methods

NO.	Interactive video evaluation method	Li,Chen,& Wang (2019)	Xu,Wang ,Li,&Liu (2020)	Yang,X &Wang (2021)	Hang,Zhang & Liu,(2021)	Wang, &Li(2021)	Repeating totals
1.	User satisfaction assessment	√	√	√	√	√	5
2.	Interactive behavior analysis	√	√	√	√	√	5
3.	Emotion analysis	-	-	√	√	-	2
4.	Assessment of Learning Effectiveness	√	√	-	√	-	3

In summary, interactive video evaluation methods include user satisfaction assessment, interactive behavior analysis, sentiment analysis, and learning effectiveness evaluation. These evaluation methods can be selected and combined based on the specific application scenarios and needs of interactive videos to achieve better evaluation results.

1) User satisfaction assessment

User satisfaction evaluation is one of the important methods for measuring the effectiveness of interactive videos. By collecting user evaluations and feedback on interactive videos, we can understand the strengths and weaknesses of the videos and provide a basis for improving them. The commonly used methods for evaluating user satisfaction include questionnaire surveys, interviews, focus groups, etc.

2) Interactive behavior analysis

Interactive behavior analysis mainly focuses on users' interactive behaviors when watching interactive videos, such as clicks, likes, comments, etc. By analyzing user interaction behavior, we can understand their level of participation and interest in interactive videos, and thus evaluate the effectiveness of interactive videos.

3) Emotion analysis

Emotion analysis is a method for evaluating the emotional effects of interactive videos. By analyzing the emotional reactions of users when watching interactive videos, such as joy, anger, fear, etc., we can understand the emotional atmosphere of

interactive videos and the emotional experience of the audience. Common sentiment analysis methods include text sentiment analysis, speech sentiment analysis, facial expression recognition, etc.

4) Assessment of Learning Effectiveness

The application of interactive videos in the field of teaching has made learning effectiveness evaluation an important evaluation method. By comparing the learning effectiveness of interactive videos with traditional teaching videos, the advantages of interactive videos in improving learning outcomes can be evaluated. Common methods for evaluating learning outcomes include testing, assignments, experiments, etc.

In this study, an evaluation strategy for ancient poetry micro-interactive videos was formed based on the interactive video evaluation method combined with the purpose of this study. User satisfaction evaluation was adopted to collect students' feedback on micro-interactive videos through questionnaires. Secondly, the interactive video quality evaluation was conducted by three evaluation experts to evaluate the quality of the interactive video content, design, and interaction. Finally, the learning effect evaluation was used to analyze the effectiveness of teaching intervention through pre- and post-tests to verify the effect of micro-interactive videos on improving students' learning of ancient poetry.

2.2 Curriculum for Teaching Chinese Poetry to Second Grade Elementary

Students

The Chinese poetry teaching curriculum for second grade elementary school aims to introduce the rich cultural heritage of Chinese poetry to primary school students, while cultivating their language skills, imagination, and literary appreciation abilities. This course aims to balance the importance of traditional Chinese values embedded in poetry with modern teaching methods, ensuring that students not only understand the content but also enjoy the learning process. This section analyzes the importance of ancient poetry, teaching principles, and teaching media, combined with classic poems such as "Looking at the Waterfall of Mount Lu", explores the curriculum of ancient poetry in second grade primary schools, and consults relevant

learning evaluations, attempting to explore the learning evaluation methods of this subject in order to comprehensively measure students' learning outcomes.

2.2.1 Importance of Learning Chinese Poetry for Second Grade Primary School Students

The basic requirements for primary school Chinese language teaching clearly state that "learning ancient poetry is an important way to understand the profoundness of Chinese culture and absorb the wisdom of national culture." (Li, 2020) Emphasizing ancient poetry teaching is conducive to cultivating students' memory and creative thinking, and can enable students to be influenced by beauty. Throughout history, ancient poetry has been the best enlightenment textbook for students. It can promote traditional ethnic culture, guide students to cherish their current happy life, inspire their love for their country and hometown, and cherish their loved ones and friends; It can educate students to be knowledgeable, rational, courteous, and honest; It can also cultivate students' diverse interests and hobbies, promoting their all-round development.

The following mainly discusses the importance of learning Chinese ancient poetry in second grade from the perspectives of cultural inheritance, language education, aesthetic education, psychological health, cognitive development, and social education

1) Cultural Inheritance Perspective

Chinese poetry is an important component of traditional Chinese culture, carrying rich historical, cultural, and philosophical ideas. Teaching ancient poetry is beneficial for promoting and inheriting excellent traditional Chinese culture. Enable elementary school students to understand and love their own ethnic culture. From the perspective of cultural inheritance, learning Chinese poetry helps second grade elementary school students establish correct historical, ethnic, national, and cultural views from an early age, enhance cultural confidence, and lay a solid foundation for inheriting and promoting excellent traditional Chinese culture (Wang, 2018). Wang (2018) pointed out that Chinese poetry is the essence of traditional Chinese culture. By learning poetry, one can enhance national pride and inherit national culture. There are many excellent traditional cultures in the ancient poems in the primary school

stage, such as climbing high to insert cornel on the Double Ninth Festival, looking at the moon and homesickness on the Mid-Autumn Festival, lying down to watch the Cowherd and the Weaver Girl on the Qixi Festival, etc. During the teaching process, the primary school students can appreciate the Chinese festival atmosphere in the traditional cultural festivals created by the ancients. In today's Western holiday era, strengthening primary school students' understanding and learning of traditional culture is beneficial for the inheritance of excellent Chinese traditional culture.

2) From the perspective of language education

The concise language and beautiful rhythm of poetry are high-quality materials for improving children's language sensitivity and expression ability. By learning poetry, second grade elementary school students can strengthen their vocabulary accumulation, enhance their language sense and rhythm, and promote the comprehensive development of their mother tongue ability (Liu, 2019). Li's (2014) research shows that learning Chinese poetry has a positive impact on improving the language expression ability of primary school students and helps cultivate good oral communication habits.

3) Aesthetic education dimension

By learning poetry, second grade elementary school students can develop their perception and appreciation of beauty, promote emotional enrichment, and cultivate aesthetic emotions (Chen, 2020). Chinese poetry is rich in aesthetic value, not only as a means of imparting knowledge, but also as a profound aesthetic education that can cultivate students' aesthetic taste and ability, and guide primary school students to grow in the experience of beauty. As the French literary critic Saint Bernard once said, the greatest poets are those who inspire the most. In the teaching of ancient poetry, our goal is to stimulate students' emotions and let them feel the influence of beauty from poetry. For elementary school students, learning ancient poetry is not only about mastering knowledge, but also about cultivating aesthetic abilities. During the teaching process, students should provide personalized interpretations of ancient poetry based on their own life experiences and feelings, in order to gain a unique aesthetic experience. Acceptance aesthetics emphasizes that readers participate in the creation of works through their own understanding and feelings during the reading process, and explore the deep meaning of the works.

The beauty and philosophy contained in Chinese poetry help cultivate the noble sentiments of second grade elementary school students and cultivate good moral qualities. Chen (2010) believes that Chinese poetry has high moral education value, and through learning poetry, primary school students can cultivate noble sentiments and good qualities.

4) On the level of mental health

Poetry often contains profound philosophy and positive emotions. Second grade elementary school students can form a positive and healthy mentality, cultivate good emotional attitudes and values through exposure to and recitation of poetry (Zhang, 2017).

5) In terms of cognitive development

Learning poetry can promote the development of elementary school students' thinking, especially their visual and logical thinking. Primary school students have the characteristic of love for imagination, and they are full of curiosity and thirst for knowledge about everything in the world. Rhetorical devices such as metaphors and symbols in poetry can stimulate students' imagination and creativity, and have a positive promoting effect on their cognitive development (Li, 2016). In teaching, based on the characteristics of ancient poetry language itself, stimulate primary school students' imagination and diverge their thinking. The language of ancient poetry is concise, but not simple. For example, in the line "Looking at Dongting Lake", "The lake and autumn moon blend together, and the mirror on the lake surface is not polished." The poet's depiction of the scenery is only simple lake water, moonlight, and Dongting Lake, but the artistic conception created is far from what words in the poem can express.

6) In terms of social education

Many themes in poetry involve insights into nature, society, and life. By learning poetry, second grade elementary school students can better understand social rules and interpersonal communication, promoting the development of their social knowledge and emotions (Zhao, 2015).

It can be seen that the importance of second grade primary school students learning Chinese poetry is not only reflected in cultural inheritance, language education, and aesthetic education, but also involves multiple aspects such as mental

health, cognitive development, and social education. These aspects are interrelated and jointly promote the comprehensive development of students. At the same time, ancient poetry is also an important medium for cultivating primary school students' cultural literacy and aesthetic taste. Learning ancient poetry can exercise primary school students' comprehension, stimulate their thinking agility, and contribute to their future learning. (Wang, 2017)

In summary, learning Chinese poetry is of great significance for second grade elementary school students. The content of ancient poetry in primary school Chinese textbooks is rich and colorful, permeating ethical and familial relationships, showcasing brilliant civilization, praising national spirit, or providing a popular science encyclopedia. It can be seen that studying ancient poetry in second grade primary schools is not only helpful for the knowledge of Chinese language subject itself, but also of great significance for the infiltration of excellent culture and the promotion and inheritance of traditional culture.

2.2.2 Connotation of Ancient Poetry Ancient poem " The Waterfall in Mount Lu Viewed from Afar"

Chinese version:

望庐山瀑布

日照香炉生紫烟，遥看瀑布挂前川。
飞流直下三千尺，疑是银河落九天。

English version:

The Waterfall in Mount Lu Viewed from Afar

By Li Bai, Translated by Xu Yuanchong

The sunlit Censer Peak exhales incense-like cloud;
Like an upended stream the cataract sounds loud.
Its torrent dashes down three thousand feet from high,
As if the Silver river fell from the blue sky.

The author of this poem is the Tang Dynasty poet Li Bai (701-762), also known as Taibai and Qinglian Jushi. He is the most distinctive and greatest romantic poet

after Qu Yuan. He is known as the "Poet Immortal" and is referred to as "Li Du" alongside Du Fu. His poetry is mainly lyrical, expressing a spirit of contempt for the powerful and showing sympathy for the suffering of the people. He is also skilled at depicting natural scenery and expressing his love for the mountains and rivers of the motherland. The poetic style is magnificent and bold, with rich imagination, natural language flow, harmonious and varied rhythms, and adept at drawing nourishment and materials from folk literature and mythology, forming its unique and splendid colors, reaching the peak of Tang poetry art. There are over a thousand surviving poems and writings, including the thirty volume "Li Taibai Collection". (Editorial Committee of "Cihai", 2009) This poem was written by Li Bai when he first visited Mount Lu during his trip to Jinling. It is an outstanding poem depicting natural scenery, with a genre of seven character quatrains. It fully demonstrates Li Bai's outstanding talent and profound artistic achievements as a great poet of the Tang Dynasty.

2.2.3 Meaning of the Chinese Poem "The Waterfall in Mount Lu Viewed from Afar"

1) Definition

Under the sunlight, Xianglu Peak produces purple smoke, and from afar, one can see a waterfall hanging like white silk in front of the mountain. The waterfall soaring and falling on the high cliff seems to be several thousand feet long, making people feel as if the Milky Way is descending from the sky to the human world.

2) Content Appreciation

The first line of this poem goes, 'The incense burner emits purple smoke in the sunshine.' A wisp of white smoke rises around the rising incense burner peak, swirling among the green mountains, and the sunlight shines on a purple cloud. The poet depicted a beautiful and mysterious scenery of Xianglu Peak, creating a serene background environment for writing about the Lushan Waterfall. The second sentence, "Looking at the waterfall hanging in front of the river from afar," begins to describe the Lushan Waterfall. "Looking from afar" indicates that the poet is looking at the general outline of the waterfall from a distance. The poet's imagination is very rich, and seeing the waterfall is like a white ribbon hanging in the mountains and rivers, vividly depicting the shape of the waterfall in the distant view. Among them,

the character "hang" is written very vividly and vividly. At the same time, the poet carefully and concisely portrays the image of the waterfall, expressing the poet's admiration for the amazing craftsmanship of nature. The third sentence "Flying down three thousand feet straight" vividly depicts the dynamic beauty of the waterfall rushing down with exaggerated techniques. The word "flying" vividly depicts the scene of the waterfall pouring down and the water splashing in all directions, making the waterfall full of graceful beauty. The word 'straight down' highlights the high and steep terrain of the mountain, while also reflecting the powerful and unstoppable force of the water flow, as if the sound of the surging waterfall water pouring down and hitting the rocky shore is right in the ear, and the white waves rising up are clearly visible, creating a magnificent artistic conception. This is not enough to describe the extraordinary beauty of the Lushan Waterfall. At the end, it is written that "it is suspected that the Milky Way falls into the nine heavens". The poet gallops his rich imagination and compares the waterfall in reality to the Milky Way above the nine heavens, instantly elevating the artistic conception to a level that is far beyond ordinary. And the poet knew it wasn't true, so he used the word 'doubt it', as if the poet couldn't find a better metaphor for the beautiful Lushan Waterfall in the secular world. Perhaps only the scenery in the sky could match the Lushan Waterfall. This' doubt 'leaves endless room for imagination.

This seven character quatrain fully unleashes the poet's rich and elegant imagination, portraying the Lushan Waterfall as exaggerated and natural, novel and authentic. Although it is only a scene, the poet uses exaggeration, metaphor and other techniques to depict the waterfall in a colorful and impressive way.

3) Poetic Analysis

Firstly, the poem's highly visual depiction makes readers feel as if they are immersed in the magnificent scenery of the Lushan Waterfall. From 'Purple smoke rising from the incense burner in Rizhao' to 'Doubting the Milky Way falling into the nine heavens', each line of poetry is constructing a vivid and layered picture, allowing readers to immerse themselves in the magnificent momentum and beautiful scenery of the waterfall. This visual sense not only enhances the artistic charm of poetry, but also makes it easier for readers to understand and accept the artistic conception and emotions conveyed by poetry.

Secondly, the emotions and artistic conception conveyed by the poem are also extremely profound and unique. The poet Li Bai expressed his reverence and admiration for nature through his depiction of the Lushan Waterfall, as well as his lofty aspirations and broad mindedness. This kind of emotional and artistic communication not only gives poetry a deeper connotation, but also enables readers to feel a positive and uplifting spiritual power while appreciating poetry.

In addition, the artistic style of the poem is also extremely distinct and unique. Li Bai, with his rich imagination and unrestrained emotions, created an artistic style that is both hazy and majestic, giving poetry both a romantic color and a realistic depth. The formation of this artistic style not only reflects Li Bai's personal artistic pursuit and aesthetic tendency, but also provides valuable reference and inspiration for later poets.

In summary, 'The Waterfall in Mount Lu Viewed from Afar' is not only an outstanding poem depicting natural scenery, but also an outstanding artwork full of emotions and imagery. It has attracted the attention of countless readers with its vivid visual sense, profound emotions and artistic conception, and unique artistic style, and has become an indispensable part of primary school Chinese education. By studying and appreciating this poem, readers can not only feel the magnificence and beauty of nature, but also appreciate the infinite charm and profound connotation of human art.

2.2.4 Principles of Teaching Chinese Poetry

Through reviewing relevant literature, the principles that should be followed for interactive videos are summarized as follows: clarity and intuitiveness, immediate feedback, matching knowledge level with challenges, balancing learning and enjoyment, and situational principles. Following these design principles will be beneficial for the development of interactive videos

1) Clear and intuitive

The principle of clarity and intuitiveness is crucial in teaching ancient poetry in primary schools. Firstly, setting clear teaching objectives can effectively stimulate students' interest in learning and improve learning efficiency. The goals should be specific and clear, in line with the curriculum standards and textbook requirements, and take into account students' cognitive characteristics and operational habits. In micro interactive video design, ensuring clear goals and tasks enables students to

identify their learning paths, thereby enhancing their learning motivation. In addition, the design of information hierarchy should be concise and clear, avoiding complex elements that increase cognitive burden. Especially for students aged 7 to 8, design should focus on clear presentation of visual levels to help students operate and learn smoothly. Through a reasonable information framework layering, students can quickly understand learning tasks, improve learning effectiveness and operational efficiency (Zhang&Yang, 2021)

In micro interactive video teaching, clear interactive path design can effectively guide students to complete learning tasks. By combining visual design with information graphics and guiding clues, the correlation between students and learning objectives is enhanced, making the learning process more specific and clear, thereby stimulating students' learning motivation. For elementary school students, design should be concise and clear, avoiding complex visual elements that interfere with the learning experience, and using visual clues to help students quickly familiarize themselves with interactive operations

2) Instant feedback principle

The real-time feedback mechanism is also very important in the design of micro interactive videos for teaching ancient poetry in primary schools. Instant feedback not only allows students to stay informed about their learning progress and knowledge mastery in real time, but also enhances their learning motivation and confidence through positive incentives. For example, when students answer questions correctly in interactive videos, immediately displaying the correct answers and giving encouraging feedback can help consolidate knowledge and stimulate motivation to continue learning. In addition, designers should ensure that each learning operation step receives timely and accurate feedback, ensuring that students can smoothly complete learning tasks and experience the joy and sense of achievement of learning (Hattie&Timperley, 2007)

3) Principle of matching knowledge level with challenge

Another key principle when designing micro interactive videos is to ensure that the level of knowledge matches the challenge. It is necessary to consider the cognitive and emotional characteristics of students and ensure that the learning content matches their level of ability. For beginners, design should provide appropriate prompts and

guidance to help them become familiar with interactive operations and reduce cognitive burden. As students' skills improve, videos should constantly adjust the difficulty of challenges to maintain a dynamic balance between skills and challenges, ensuring that students gain a sense of achievement and continue to make progress in the learning process

4) The principle of balancing learning and enjoyment

The principle of balancing learning and enjoyment is also of great significance in the teaching of ancient poetry in primary schools. Students are naturally active and curious, and they tend to learn through exploration and games. Therefore, the design of interactive teaching videos should ensure educational content while also providing sufficient entertainment to stimulate students' interest in learning. If interactive videos focus too much on interactivity and neglect teaching content, students may be attracted by entertainment functions and deviate from learning goals. On the contrary, if the teaching content is too serious and lacks interactivity, students may lose interest in learning. Therefore, designers should find a balance between education and entertainment to ensure that students achieve their learning goals in a pleasant atmosphere (Gee, J. P. 2003)

5) Situational principle

Finally, the situational principle emphasizes the integration of poetry learning with students' real-life experiences to create an attractive learning environment. Situational learning can stimulate students' behavioral motivation, awaken their empathy by simulating real or familiar scenes, and enable them to better understand the connotation of poetry. In the design of micro interactive videos, the advantages of interactive videos should be fully utilized. Based on the age characteristics and course requirements of students, story scenarios should be designed and familiar life elements should be incorporated. Enhance students' sense of immersion and learning experience through various sensory stimuli such as visual, auditory, and tactile senses. This immersive teaching method helps students gain deeper emotional resonance and understanding when learning ancient poetry (Brusilovsky,&Mill á n., 2007)

In general, the teaching of ancient poetry in primary schools should focus on clarity and intuitiveness, immediate feedback, matching skills and challenges, balancing learning and enjoyment, and situational principles. Through these

principles, teachers can design more effective and attractive teaching plans to help students deepen their understanding and appreciation of ancient Chinese poetry in a pleasant atmosphere, thereby cultivating their cultural literacy and aesthetic ability. The application of these principles can not only improve students' learning efficiency, but also enhance their interest in learning, laying a solid foundation in poetry and literature during primary school.

2.2.5 Media Used for Teaching Chinese Poetry

Against the backdrop of the continuous development of modern educational technology, Chinese poetry teaching is increasingly utilizing various media resources to enrich teaching methods and improve teaching effectiveness. At present, the commonly used media in Chinese poetry teaching mainly include paper textbooks, blackboards, projectors, interactive software, online resources, and new media platforms. The application of these media in teaching brings both convenience and some challenges.

Paper textbooks and blackboards: As traditional teaching media, paper textbooks and blackboards have the advantages of good stability, low cost, and easy use. They can provide students with clear and systematic knowledge of poetry, which helps cultivate their reading and writing abilities. However, there are certain limitations in terms of the amount of information transmitted and the way it is presented. They cannot display dynamic images and sounds, nor can they provide real-time interactive feedback, making poetry teaching monotonous and boring.

Projectors and interactive software: The application of projectors and interactive software, such as video, audio, and other media resources, can provide more intuitive and vivid learning materials, helping students better understand and appreciate poetry. Make poetry teaching more vivid and vivid. By displaying rich multimedia materials such as images, audio, and videos, students can better understand the artistic conception and emotions of poetry. Meanwhile, interactive software can also enhance students' participation and stimulate their interest in learning. The application of projectors and interactive software can enhance the vividness and imagery of poetry teaching, but it can also easily lead to student dependency. Overreliance on these media may lead students to neglect in-depth reading and thinking of poetic texts, thereby affecting their ability to appreciate poetry and cultivate creativity.

Online resources and new media platforms: Online resources and new media platforms provide a vast amount of information and diverse learning methods for poetry teaching. Students can search for various poetry works, appreciation articles, teaching materials, etc. through the internet, broadening their learning horizons. At the same time, new media platforms such as WeChat official account and Tiktok also provide new communication channels for poetry teaching, which helps improve students' autonomous learning ability. Although online resources and new media platforms provide rich information and diverse learning methods for poetry teaching, there are also some challenges. For example, the authenticity and accuracy of online information are difficult to guarantee, and students may be influenced by negative information; Meanwhile, the fragmented information on new media platforms may also prevent students from forming a systematic knowledge system of poetry.

In summary, the current media used in Chinese poetry teaching has both advantages and disadvantages. This study will leverage strengths and avoid weaknesses, combining traditional teaching methods and utilizing the dual advantages of rich and interactive content in micro videos to provide a new, more vivid, interactive, and personalized learning environment and experience for ancient poetry teaching. Not only can it vividly showcase the artistic conception of ancient poetry through dynamic images and sounds, but it can also stimulate students' interest and participation in learning through interactive activities.

2.2.6 Methods for Assessing Learning Outcomes in Chinese Poetry

The methods for evaluating the learning outcomes of Chinese poetry can be diversified to meet the needs of different learning stages and goals. Here are some commonly used evaluation methods:

1) Classroom performance evaluation

Teachers can observe students' performance in class, such as reading aloud, memorizing, discussing, etc., to evaluate their mastery and understanding of poetry. By observing students' voices, rhythms, intonations, and emotional expression abilities, teachers can determine whether students truly understand the meaning of poetry (Xu, 2018).

2) Homework and testing

Assigning homework related to poetry, such as poetry creation, poetry appreciation, fill in the blank dictation, etc., can test students' memory, comprehension, and creative abilities. Standardized tests, such as poetry fill in the blank questions and appreciation questions in the middle and high school entrance exams, although having their limitations, are still an important means of evaluating students' poetry learning outcomes (Zhao&Liu, 2020).

3) Recitation and performance evaluation

In recitation and performance, students can express their understanding and feelings towards poetry through various means such as sound, expression, and movement (Wang, 2017).

4) Comprehensive evaluation

In addition to the specific evaluation methods mentioned above, a comprehensive evaluation approach can also be adopted, taking into account multiple aspects such as students' reading interests, cultural perspectives, aesthetic abilities, artistic interests, and appreciation personalities (Chen&Sun, 2019). This evaluation method is more comprehensive and objective, and can more accurately reflect students' poetry learning outcomes.

2.3 Learning Theory

Learning theory, abbreviated as "learning theory", refers to various theories that explain the nature, process, and factors that affect learning in humans and animals. According to the relevant theories of pedagogy and media studies, combined with practical applications, it is believed that multimedia learning theory, situational cognition theory, feedback and reinforcement theory are helpful to this research.

2.3.1 Meaning of Learning

The meaning of learning has different interpretations under different theoretical frameworks. This study mainly explores it from the perspectives of multimedia learning theory, situational cognition theory, feedback and reinforcement theory, etc.

1) The learning significance of multimedia learning theory

Multimedia learning theory points out that using visual, auditory and other multi-channel ways to transmit information can significantly improve students' cognitive efficiency and memory ability (Mayer, 2009). Interactive videos create rich sensory

stimulation by integrating images, sounds and texts, which reduces students' cognitive burden. For primary school students, the abstract imagery of ancient poems is difficult to understand. The multimedia content in micro-interactive videos (such as animations, audio commentary, etc.) helps students intuitively understand the poetry and deepen their memory and emotional experience (Mayer, 2014).

2)The learning significance of situational cognition theory

Situational cognition theory advocates that learning should take place in an environment similar to the actual application situation to help students better apply what they have learned to real life (Brown et al., 1989) . Micro-interactive videos simulate the natural scenes or historical backgrounds in poems through virtual situations, helping students learn ancient poems in a specific context. This kind of situational learning not only improves students' emotional resonance with ancient poems, but also enhances their understanding of the background of poetry creation, which helps the transfer and application of knowledge.

3)The learning significance of feedback and reinforcement theory

Feedback and reinforcement theory believes that timely and effective feedback can significantly improve learners' learning outcomes (Hattie & Timperley, 2007). In interactive videos, through the instant feedback function, students can quickly realize the mistakes they made in the learning process, and adjust their learning strategies in time on this basis, thereby promoting the internalization of correct knowledge (Narciss, 2008). This continuous feedback mechanism is particularly effective in the study of ancient poetry. Through repeated practice and feedback, students can gradually deepen their understanding and memory of the content of poetry and improve their mastery. This process not only helps students correct their mistakes, but also strengthens their learning motivation and self-confidence, making learning more efficient.

By combining these theories together, micro-interactive videos provide a diversified learning method for elementary school ancient poetry teaching, which not only helps students quickly understand the poetry through multi-sensory stimulation, but also allows students to construct knowledge more independently through interaction and feedback mechanisms, and apply this knowledge to situations. In the

end, this learning method based on interactive videos can greatly improve students' learning interest and effect, and cultivate their ability to learn and think independently.

The integration of these theories in micro-interactive videos makes interactive learning a highly effective tool, especially suitable for areas that require a high level of comprehension and deep thinking, such as the study and interpretation of ancient poetry.

2.3.2 Importance of Learning

1) Multimedia learning theory

Multimedia learning theory emphasizes that students' learning effects can be enhanced by combining multi-channel input information such as vision and hearing. In the study of ancient poetry, micro-interactive videos help students better understand the poetry through multimedia forms such as images, sounds and texts, reduce cognitive load, and improve learning interest and memory.

2) Situational cognitive theory

Situational cognitive theory believes that learning should be carried out in an environment similar to the actual application situation. Micro-interactive videos can enhance students' learning experience by simulating the scenes and situations of ancient poetry, enabling them to understand the imagery and emotions of poetry in real situations, thereby promoting the transfer and application of knowledge.

3) Feedback and reinforcement theory

Feedback and reinforcement theory emphasizes the importance of timely feedback, and believes that immediate feedback can help students quickly correct mistakes and enhance the internalization of correct knowledge. Through the instant feedback mechanism in micro-interactive videos, students can get timely guidance in the study of ancient poetry, improve learning efficiency and self-confidence, and consolidate memory and application capabilities.

2.3.3 Principles of Learning

1) Learning principles of multimedia learning theory

Dual encoding principle: learners can better understand and remember content when they process information through visual and auditory dual channels. This means

that micro-interactive videos should provide text, pictures and sounds at the same time to help students participate in multiple senses and enhance their understanding of ancient poems.

Distraction principle: avoid giving students too much information at the same time. The content in the video should avoid interference between visual and auditory elements to ensure that students can focus on the most important learning goals.

Integration principle: images and text should be used together to make it easier for students to integrate visual information and language information together to improve learning effects.

2) Learning principles of situational cognitive theory

Real situation principle: learning should occur in situations similar to actual application environments. Therefore, micro-interactive videos need to create scenes similar to those described in ancient poems, so that students can learn the imagery and emotions of poems in an immersive way, helping them transfer knowledge to real life.

Social interaction principle: situational learning emphasizes the interaction between learners and the environment. By interacting with the content in the video, students can construct knowledge through operation and feedback to improve their understanding of ancient poems.

Principle of cultural embedding: Learning content should be embedded in the cultural background. The ancient poetry learning in micro-interactive videos should be combined with ancient culture and background to help students understand the cultural connotation and historical significance of poetry.

3) Learning principles of feedback and reinforcement theory

Principle of timely feedback: During the learning process, students need instant feedback to help them correct mistakes in time and internalize correct knowledge. The instant feedback function in micro-interactive videos (such as prompts for questions or interactive tasks) should be presented in time to help students improve their learning effects.

Principle of reinforcement: When students complete the correct operation, positive feedback (such as rewards or encouragement) can enhance students' learning motivation and self-confidence and motivate them to continue learning ancient poetry.

Principle of continuous feedback: Learners need to receive continuous feedback throughout the learning process. This feedback should be consistent throughout, helping students gradually master the content of ancient poetry through repeated corrections.

These principles together ensure the effectiveness of micro-interactive videos in the teaching of ancient poetry in primary schools, enhancing students' learning experience and effects through multi-channel input, real situations and timely feedback.

2.3.4 Key components of learning

1) Key components of multimedia learning theory

Visual and auditory channels: Multimedia learning enhances information processing and memory by combining vision and hearing. The key is to integrate multi-channel inputs such as images, sounds and text to reduce cognitive load.

Cognitive load management: Effective multimedia learning should avoid information overload and control cognitive load through appropriate input so that learners can focus on the core content.

Principle of consistency: Multimedia elements must be coordinated with each other to avoid irrelevant pictures, sounds or texts distracting students.

2) Key components of situated cognition theory

Real context: Knowledge acquisition should occur in a simulated or real context, which helps students transfer knowledge to real life.

Social interaction: Learners construct knowledge through interaction with the environment and other learners, so situated cognition emphasizes cooperation and communication.

Contextualized tasks: Task design should be related to real life situations, and learners master and apply knowledge by completing these tasks.

3) Key components of feedback and reinforcement theory

Instant feedback: Instant feedback during the learning process can help students correct errors and strengthen the correct cognitive path.

Positive reinforcement: Reinforcing correct behavior and knowledge through rewards or encouragement helps improve students' learning motivation.

Feedback loop: The continuous feedback process helps students gradually master what they have learned by repeatedly correcting their mistakes.

These components are the core of achieving effective learning in various learning theories, and they work together to improve learning effects through multi-sensory stimulation, real-life situations, and feedback mechanisms.

2.3.5 Critical Factors in the Learning Environment

In the learning environment, there are multiple key factors that have a significant impact on learning outcomes and students' learning experiences. Here are several key factors in the learning environment when learning Chinese ancient poetry through micro interactive videos:

1) Learning Content

The video content should meet the goals and requirements of learning ancient poetry. Corresponding interactive videos should be designed based on the key and difficult points in classroom teaching, such as interpreting the cultural and historical background of ancient poetry, helping students understand the emotions and artistic conception expressed in ancient poetry, and increasing students' emotional investment and cultural cognition in ancient poetry. Conduct in-depth analysis and appreciation of the structure, imagery, rhetorical devices, etc. of ancient poetry, guide students to understand the connotation and aesthetic value of ancient poetry from multiple perspectives, and enhance their literary appreciation ability. By providing beautiful interactive voice recitation, students can not only appreciate the beauty of rhythm and rhyme in ancient poetry, but also enhance their perception and understanding of ancient poetry. Presenting the cultural connotations and emotional expressions of ancient poetry in a vivid and interesting way, while emphasizing the beauty of language and poetic expression, can arouse students' interest and curiosity.

2) Accessibility and Quality of Learning Resources

The key to learning is for students to have easy access to high-quality learning resources. It is an effective way to enhance students' learning experience and effectiveness, promote a deeper understanding of ancient poetry, and facilitate learning outcomes.

Firstly, in terms of accessibility, micro interactive videos should be easily accessible to students. This requires ensuring that students can watch video content at the appropriate time and place, such as through online video platforms, educational websites, or internal school resource platforms. In addition, multiple access channels should be provided, such as supporting viewing on different devices (such as mobile phones, tablets, computers, etc.), to meet the learning needs of students in different scenarios. After conducting research on current Chinese interactive video platforms, bilibli was ultimately chosen as the publishing platform for this study.

Secondly, in terms of quality, video production should be excellent, with clear images and high-quality sound effects to enhance students' learning experience. In addition, the video content should be in line with students' learning objectives and course requirements, and can help students understand and master the core knowledge and skills of ancient poetry.

Through the above measures, the accessibility and quality of micro interactive videos in ancient poetry learning can be effectively improved, providing students with a more convenient and efficient learning experience, thereby promoting their in-depth understanding of ancient poetry and improving their learning outcomes.

3) Learning Support and Assistive Services

Timely learning support and effective auxiliary services can help students solve problems and difficulties in learning. Specifically, online and offline support and assistance should be provided to students' learning through pre class preparation, in class focus, and post class review. At the same time, through online services, students can share their learning experiences, discuss problems, support and encourage each other through bullet comments, messages and other means, thereby enhancing the interactivity and participation of learning. It can also provide students with a wider range of learning resources and information, enrich their learning experience, and is an important way to promote communication and interaction between students and teachers.

In summary, content design, accessibility and quality of learning resources, and the application of micro interactive videos for learning support and auxiliary services in the learning environment of Chinese ancient poetry are key factors that collectively promote students' deep understanding of ancient poetry and enhance their learning experience.

2.3.6 Learning Progression

In the teaching environment of using micro interactive videos for Chinese elementary school students to learn ancient poetry, the learning progress can be divided into the following stages:

1) Introduction phase:

At this stage, students are introduced to ancient poetry for the first time through micro interactive videos, understanding the basic forms and characteristics of ancient poetry. The video may include recitation of ancient poems, simple explanations, and relevant cultural background introductions to stimulate students' interest and curiosity.

2) Understanding stage:

Students begin to deepen their understanding of the content and artistic conception of ancient poetry through micro interactive videos. The video may contain interactive questions that encourage students to think about the meaning of poetry, as well as the poet's emotions and creative background. Students explore different interpretations and understandings by choosing different interactive paths.

3) Memory and Consolidation Stage:

At this stage, students memorize ancient poems by repeatedly watching and participating in games or exercises in micro interactive videos. Videos may provide memory techniques such as rhyme, rhythm, and image association to help students better remember the text of ancient poetry.

4) Application and Expansion Stage:

Students begin to apply their knowledge of ancient poetry to new contexts, such as creating their own poetry or connecting ancient poetry with modern life. Micro interactive videos may provide creative tools or templates to encourage students to create and express themselves.

5) Evaluation and Reflection Stage:

Students evaluate their learning outcomes through a feedback system of micro interactive videos, such as completing online quizzes or participating in peer evaluations. The video may contain guidance for self reflection, helping students identify their learning progress and areas for improvement.

Ultimately, students are able to independently explore and learn ancient poetry with the support of micro interactive videos. They are able to independently choose learning paths, seek resources, solve problems, and share their learning achievements with others.

Through these stages, micro interactive videos not only provide an interactive and personalized learning resource, but also promote students' comprehensive development in ancient poetry learning, including cognitive, emotional, social, and creative aspects.

2.3.7 Behaviors Resulting from Learning

Against the backdrop of the application of micro interactive videos in teaching Chinese ancient poetry, students' learning behavior has undergone significant changes. Firstly, students showed a higher level of participation, actively engaging in the study of ancient poetry through interactive operations such as clicking and dragging. This participation not only increased their interest in the content of ancient poetry, but also enhanced their learning motivation. As students deepen their learning, they begin to actively explore and utilize the resources provided by micro interactive videos, such as the poet's life and historical background, to enrich their understanding of ancient poetry. In the stage of memory and consolidation, students not only remember the text of ancient poems through repeated viewing and interactive exercises, but also can recite them fluently in classroom discussions. In addition, the instant feedback mechanism of micro interactive videos encourages students to engage in self-evaluation and reflection, enabling them to identify their learning progress and areas for improvement. In the application and expansion stage, students apply their learned knowledge to new creations, such as attempting to create poetry on their own or connecting ancient poetry with modern life. This not only exercises their creativity, but also deepens their understanding of ancient poetry culture. In the end, with the assistance of micro interactive videos, students developed the ability of self-directed learning and shared their learning achievements with their peers and family,

demonstrating their autonomy and innovation in learning. These changes in behavior not only demonstrate the effectiveness of micro interactive videos in teaching, but also showcase the comprehensive development of students in cognition, emotion, socialization, and creativity.

2.3.8 Methods for Assessing Learning Outcomes

The evaluation of educational interactive videos mainly focuses on timely summarizing and reflecting on the problems that arise during the development and implementation of interactive micro courses, and continuously improving to achieve the best teaching effect. Referring to the suggestions for teaching evaluation based on the primary school ancient poetry curriculum standards, the evaluation of micro interactive videos also advocates the principle of "diverse subjects and diverse methods". The main methods include formative evaluation and summative evaluation: formative evaluation refers to the evaluation conducted during the development of interactive micro courses, mainly through self-evaluation, summarizing the problems that exist in the development process of interactive micro courses, and reflecting and correcting them in a timely manner; Conduct more interviews with students, communicate with them more, understand their feelings more, and find areas for improvement in interactive micro courses from their perspective; Evaluate the problems of interactive micro courses from a quantitative perspective through periodic tests, questionnaire surveys, classroom observations, and other forms; Summative evaluation refers to testing students after the overall development and implementation of interactive micro courses, evaluating whether the designed interactive micro courses have achieved the expected teaching objectives based on the test results, and making corresponding improvements according to specific situations.

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2.4 Conceptual framework for research

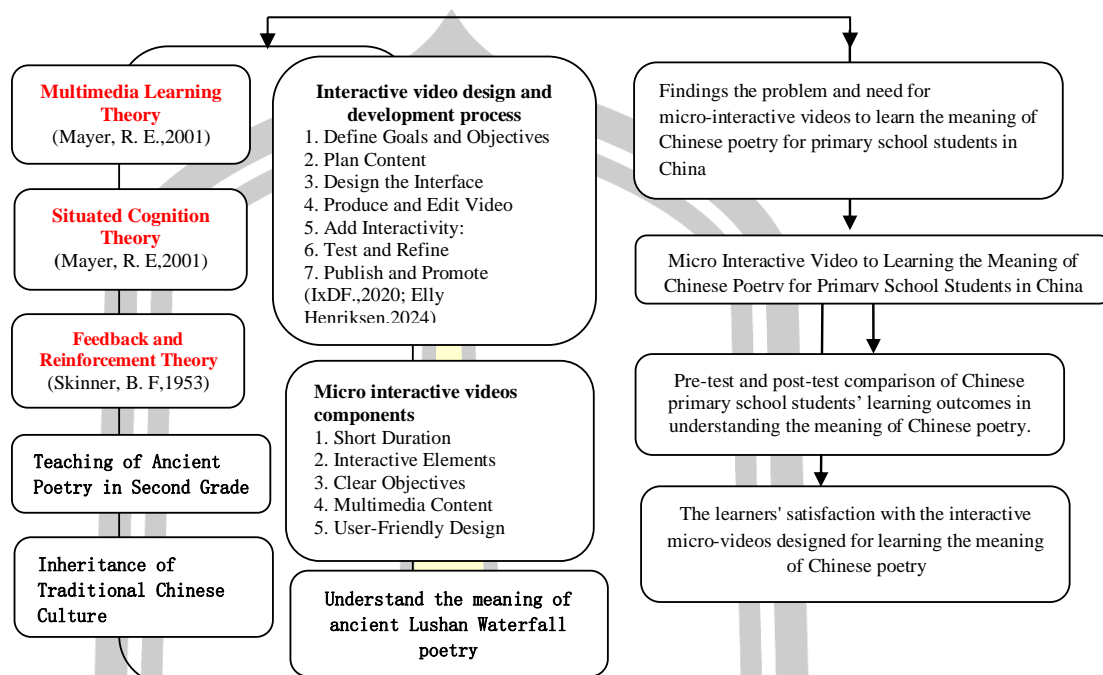


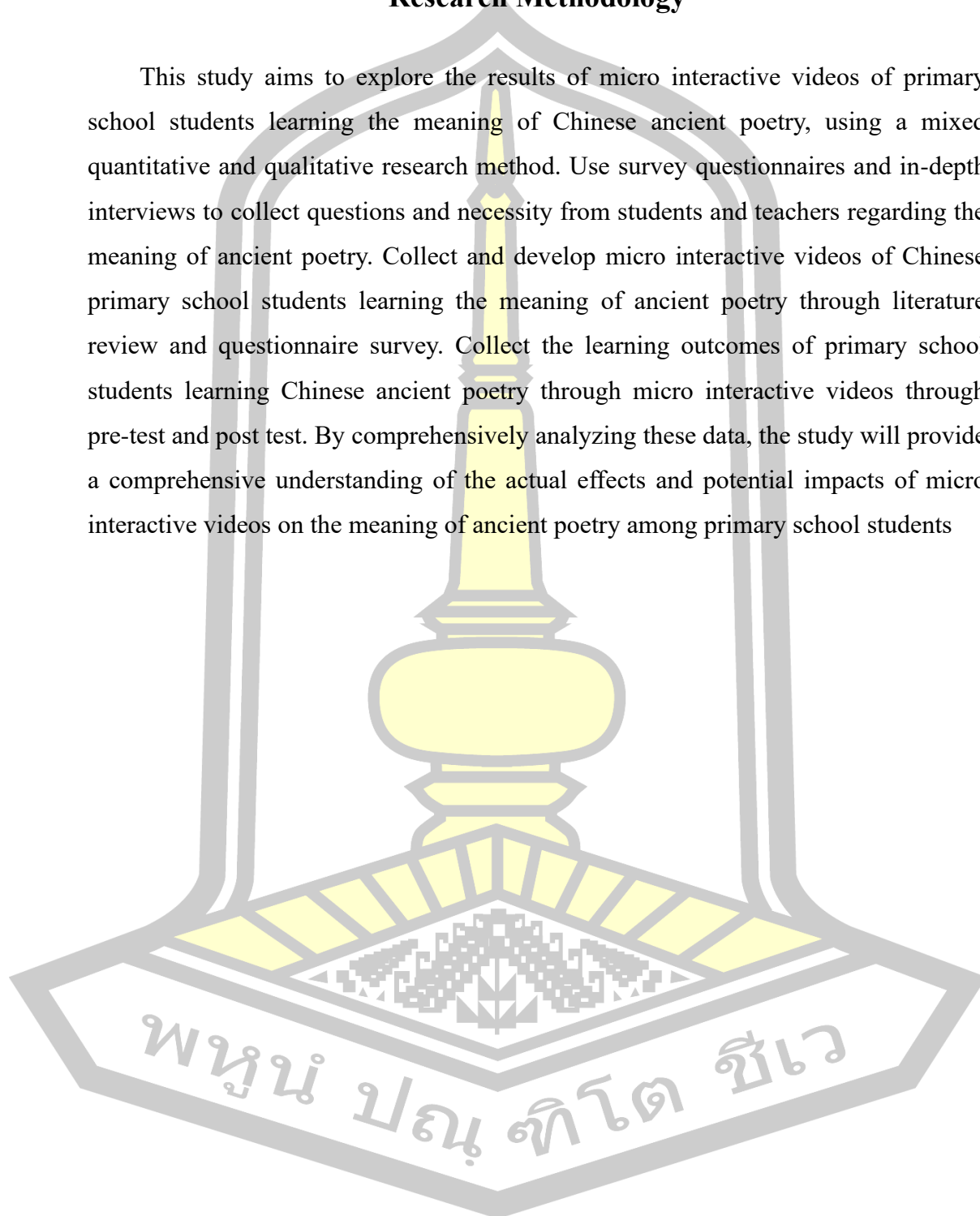
Figure 3 Conceptual framework



Chapter 3

Research Methodology

This study aims to explore the results of micro interactive videos of primary school students learning the meaning of Chinese ancient poetry, using a mixed quantitative and qualitative research method. Use survey questionnaires and in-depth interviews to collect questions and necessity from students and teachers regarding the meaning of ancient poetry. Collect and develop micro interactive videos of Chinese primary school students learning the meaning of ancient poetry through literature review and questionnaire survey. Collect the learning outcomes of primary school students learning Chinese ancient poetry through micro interactive videos through pre-test and post test. By comprehensively analyzing these data, the study will provide a comprehensive understanding of the actual effects and potential impacts of micro interactive videos on the meaning of ancient poetry among primary school students



3.1 Research Framework

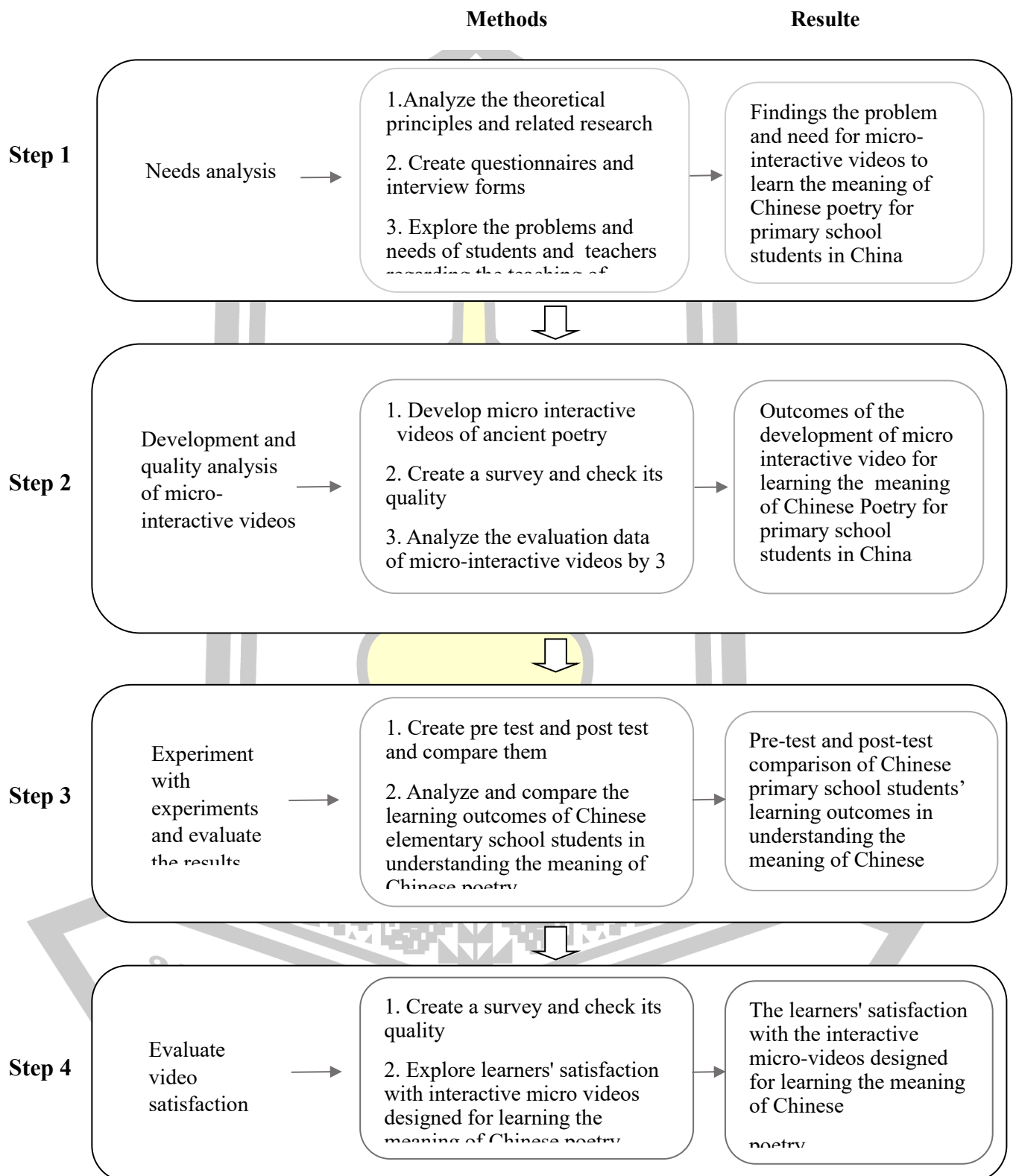


Figure 4 Research Process

3.2 Population and Sample Groups:

3.2.1 Population:

According to the research objectives, the study population is divided into three categories: Chinese language teachers, second grade students, and experts in interactive video quality inspection.

1) Chinese language teacher

Chinese language teachers are the main implementers of teaching ancient poetry: Chinese language teachers are directly responsible for teaching ancient poetry, and their understanding and teaching methods of ancient poetry have a profound impact on students' learning of ancient poetry. Studying Chinese language teachers' cognition, acceptance level, and application of micro interactive videos of ancient poetry in classroom teaching can provide important references for the teaching of ancient poetry in micro interactive videos.

2) Second grade students

Students are the main body and direct beneficiaries of ancient poetry learning. Their cognition, acceptance, and feedback directly affect the effectiveness of micro interactive videos in the dissemination of ancient poetry. Understanding students' preferences, cognitive levels, and learning outcomes of micro interactive videos on ancient poetry can help optimize the production and application strategies of micro interactive videos, and improve the effectiveness and attractiveness of ancient poetry teaching. The "Compulsory Education Chinese Language Curriculum Standards" (hereinafter referred to as the curriculum standards) compiled by the Chinese Ministry of Education are the benchmark for every Chinese language teacher's teaching and have important guiding significance for Chinese language teaching. Therefore, this study analyzed the arrangement of Chinese language courses to determine the selected group.

The latest curriculum standards divide the curriculum objectives in primary school into three stages, namely grades 1-2, 3-4, and 5-6. The teaching objectives of different stages also vary. Therefore, researchers need to fully consider the specific learning objectives and content of each stage based on their learning situation, select the objects to be studied, and set specific teaching content. The specific and cost-

effective teaching objectives for ancient poetry in the curriculum standards are as follows:

The teaching objective of ancient poetry in the first stage (grades 1-2) is to "recite nursery rhymes, children's poems, and ancient poems, expand imagination, gain preliminary emotional experience, and feel the beauty of language." (Chinese Ministry of Education, 2021) The focus is on cultivating students' literacy, handwriting ability, and reading skills. At this stage, the teaching content focuses on simple and easy to understand, rhythmic and rhythmic poetry, with the aim of allowing students to feel the beauty of language, engage in imagination, and gain preliminary emotional experiences through recitation.

The teaching of ancient poetry in the second stage (grades 3-4) not only continues to strengthen literacy and handwriting, but also increases the understanding of the general meaning of poetry and prose and the comprehension of the author's emotional expression. This requires that the course content not only help students master the basic knowledge of poetry, but also guide them to experience the emotions in poetry.

The teaching of ancient poetry in the third stage (grades 5-6) places more emphasis on the learning of students' emotional attitudes and values, as well as the cultivation of independent thinking ability. Students need to read and understand poetry, imagine the situations depicted in the poem, experience the emotions in the work, and be inspired and inspired by excellent works.

From the curriculum arrangement, it can be seen that the first stage (grades 1-2) is the first stage of learning ancient poetry and also the enlightenment stage. It is crucial for cultivating students' interest in learning and guiding them to love ancient poetry.

Through appeal analysis, second grade is the first stage for students to come into contact with poetry and literature. At this time, students begin to learn poetry and establish a basic understanding of literature. By introducing micro interactive videos at this stage, students' interest and understanding of ancient poetry can be cultivated, laying a foundation for future in-depth learning.

Furthermore, from the perspective of individual students, second grade students are approximately 7-9 years old and are in a stage of rapid development in language

and cognitive abilities. They have a strong curiosity and ability to accept new things, and are suitable for exposure to new teaching methods and tools. At the same time, the cognitive ability of second grade students is constantly improving, as they are able to understand simple abstract concepts and emotional expressions. Through micro interactive videos, ancient poetry content can be presented in various ways such as images, sounds, and interactions, which can better evoke emotional resonance and cognitive inspiration among students. In addition, studying the acceptance and learning effectiveness of second grade students towards micro interactive videos of ancient poetry can provide practical references for ancient poetry teaching. Understanding their feedback and experience can help optimize the production and teaching methods of micro interactive videos, and enhance the attractiveness and effectiveness of teaching ancient poetry.

Therefore, selecting second grade students as the research population can help to gain a deeper understanding of the application effects of ancient poetry in micro interactive videos, and provide practical support and guidance for the improvement and innovation of teaching the meaning of ancient poetry.

3) Expert in quality inspection of interactive videos

To ensure the scientificity of the evaluation process and the effectiveness of the evaluation results, the determination of the expert group for interactive video quality inspection should have a deep professional understanding and experience in the field of expertise, as well as rich practical experience in similar projects. To ensure the comprehensiveness of the evaluation, the expert team should also include people from different backgrounds.

The collection of the questionnaire will use online collection tools, such as QR codes and online sharing platforms, which can save manpower, material resources, time, etc., greatly improving the efficiency of the questionnaire. In addition, distributing the questionnaire through the internet will make it widespread and unified, without the need for signatures, and the content will be relatively objective and authentic.

3.2.2 Sample group:

1) Determine the sample size:

The sample components used in the study are divided into the following three groups

1.1) Second grade students

Through investigation, the second grade students of Longyi Primary School were selected as the subjects of this study. The school has four classes of second grade students, totaling 115 people. Located in Zhengzhou, Henan Province, China, it is a public primary school with abundant teaching resources that meet the conditions for this study. The relevant teachers of the school are very willing to provide necessary support and assistance for this study.

1.2) Chinese language teacher

Through investigation, a total of 4 second grade Chinese language teachers from the school will participate in this research.

1.3) Experts in Interactive Video Quality Inspection

The interactive media design and development team is composed of experts with relevant qualifications and more than 10 years of work experience, including users, designers, and developers of interactive media. The sample group was not selected through a specific method based on statistical probability (non probability sampling), with a total of 3 people.

2) Determination method for student sample group

The main method for determining the student sample group in this study is through random drawing of lots

Compile student list: Compile a list of all second grade classes in the school, numbered 1 to N (where N is the total number of classes).

Sampling: Using a random number table or random drawing tool, randomly select a class from the list as a sample. Randomly draw lots using a random number generator to ensure fairness and randomness in the drawing process.

In the sample determination process of this study, the fairness and transparency of the drawing process were ensured, and any bias or interference factors affecting the sampling results were avoided. Before conducting the study on the sample, we first solicited the school and parent hospitals orally, and conducted a survey questionnaire

through parents during the study to ensure that their willingness to participate in the study meets the school's requirements and research ethics regulations.

Through the above steps, a random sample group for a second grade student at Longyi Primary School can be determined, providing a representative and reliable data foundation for the study.

3.3 Research Variables

3.3.1 Independent variable

A micro interactive video designed for elementary school students to learn the meaning of Chinese poetry.

The main elements that affect micro interactive videos include content design, interactive elements, visual effects, sound effects, branching structure, feedback mechanism, publishing platform, and other factors.

3.3.2 Dependent variable

Micro interactive video quality for Chinese elementary school students to learn the meaning of ancient Chinese poetry

The learning effect of micro interactive videos of Chinese ancient poetry for primary school students in China

3.4 Research Scope:

The scope of micro interactive videos studying the meaning of Chinese poetry for Chinese elementary school students involves the following aspects:

This study will mainly focus on second grade students, exploring their acceptance, understanding, and learning effectiveness of micro interactive video ancient poetry.

3.4.1 Regional Scope:

This study will focus on second grade students at Longyi Primary School located in Zhengzhou, Henan Province, China.

3.4.2 Time Range:

The research will be conducted within a specific time period, typically spanning several months or a year depending on the research objectives and available resources.

3.4.3 Scope of Interactive Elements:

This study will explore various interactive elements of primary school micro interactive video applications, including but not limited to clicking, dragging, branching options, etc.

3.4.4 Target audience scope:

- 1) Four Chinese language teachers interviewed on issues such as the meaning of ancient poetry and the demand for micro interactive visual applications.
- 2) Randomly select 35 students from the second grade of Longyi Primary School, share interactive videos with them for ancient poetry learning and pre - and post tests, and distribute QR codes for online questionnaires, inviting them to participate in the survey.
- 3) Three experts in content, design, and interactive media will evaluate the quality of interactive micro videos of elementary school students' ancient poetry.

3.4.5 Scope of Poetry Selection:

The study conducted in-depth research on the text analysis of primary school ancient poetry textbooks from grade 1 to grade 2 in the first stage, and ultimately selected the ancient poem "The Waterfall in Mount Lu Viewed from Afar" as the main content of this study. The analysis is as follows:

The selection of ancient poems in primary school Chinese textbooks has a long history and is a very valuable teaching resource. The selected themes of ancient Chinese poetry in the first to third grade Chinese textbooks published by the Ministry of Education are mainly characterized by the following three features: a wide range of themes, with a focus on depicting scenery and expressing emotions; Rich in genre, mainly consisting of quatrains; Emotionally diverse, with a focus on praising nature. (Zhou, Y. T. 2020)

- 1) Wide range of themes, mainly focusing on depicting scenery and expressing emotions

Through the analysis of the current primary school ancient poetry unified edition textbook, the themes of ancient poetry can be roughly divided into three categories: lyrical poems about scenery, poems about objects and aspirations, and poems about emotions and feelings. By analyzing Table 3-1, it can be found that in the Chinese language textbooks for grades one to two of primary school, ancient poems with the

theme of depicting scenery and expressing emotions account for the majority. Based on this, the author selected "Looking at the Lushan Waterfall" as the content of this micro interactive video. The images presented depict the scenery of the Lushan Waterfall, which is in line with the characteristic of ancient poetry textbooks that focus on depicting scenery and expressing emotions.

Table 3.1 Statistics of Selected Ancient Poetry Themes in Chinese Language Textbooks for Primary School Grades 1-2

grade	Write scenery and express emotions	Singing about objects and expressing aspirations	Reflection on the current situation
1st semester of 1st grade	2	3	1
2st semester of 1st grade	3	1	3
1st semester of 2st grade	5	1	1
1st semester of 2st grade	4	1	2
total	14	6	7
Proportion	52%	22%	26%

2) Rich in genre, mainly consisting of quatrains

As shown in Table 3.2, in the genre of ancient poetry in primary school Chinese language textbooks, seven character quatrains account for more than half and 53% (such as "The Waterfall in Mount Lu Viewed from Afar"), and five character quatrains account for 24%. The characteristics of five character quatrains and seven character quatrains, which are short, concise, catchy, and easy to memorize, are in line with the learning characteristics of primary school students. Meanwhile, from Table 3.2, it can be observed that the number of seven character regulated poems increases step by step from first to third grade. Therefore, choosing the song "The Waterfall in Mount Lu Viewed from Afar" for second grade teaching can serve as a bridge between the past and the future.

Table 3.2 Statistics of Selected Classical Poetry Genres in the Chinese Language Textbook for Primary School Grades 1-3

Grade	Ancient poetry	modern-style poetry					other
		Quatrain sentence		Rhythmic Poetry			
		Five Absolute	Seven Absolute	Five Rhythm	Seven Rhythm	Pailing Rhythm	
1st semester of 1st grade	2	4					
2st semester of 1st grade	1	3	3				
1st semester of 2st grade	1	2	2	1			1
2st semester of 2st grade	3		4				
1st semester of 3st grade		1	8				
2st semester of 3st grade		1	7				1
total	7	11	24	1			2
Proportion	16%	24%	53%	2%	0%	0%	4%

3) Emotionally diverse, with a focus on praising nature

The ancient poems in primary school Chinese textbooks cover a wide range of thoughts and emotions. As shown in Table 2-5, a large number of poems from first to second grade are used to praise nature and the beautiful rivers and mountains of our country, which reflects our deep affection for the natural beauty and the land of our motherland. Relatively speaking, there are relatively few poems that express longing for hometown and loved ones, as well as nostalgia for friends. This selection preference is in line with the learning patterns and cognitive abilities of elementary school students. As elementary school students are in a critical stage of physiological and psychological development, they are more likely to resonate with concrete, intuitive, and vivid things. Ancient poems that praise nature and the mountains and rivers of our motherland often have vivid images and scenes, which are easy for elementary school students to understand and accept.

Table 3.3 Statistics of Emotional Themes in Selected Ancient Poetry in the Chinese Language Textbook for Primary School Grades 1 to 2

Grade	Praise of natural scenery	Homesickness	Reflections on Life	Memories of friends
1st semester of 1st grade	5		1	
2nd semester of 1st grade	4	1	1	1
1st semester of 2nd grade	5	0	2	0
1st semester of 2nd grade	5	0	2	0
total	19	1	6	1
Proportion	70%	4%	22%	4%

In summary, "Viewing the Waterfall of Mount Lu" was written by the famous Tang Dynasty poet Li Bai, and is a representative work of ancient poetry that expresses emotions and scenery. It expresses the author's praise and love for the beautiful rivers and mountains of our motherland. At the same time, through this poem, a strong visual impact and emotional expression can be presented through micro interactive videos, which can better stimulate students' interest in learning and improve classroom learning efficiency.

3.4.6 Scope of Micro Interactive Video Forms

For the poem "The Waterfall in Mount Lu Viewed from Afar", the following micro interactive video format can be designed: using animation to showcase the magnificent landscape of Mount Lu Waterfall to students, allowing them to visually experience the spectacular waterfall depicted in the poem. Accompanied by realistic waterfall sound, students can experience the grandeur of the waterfall and the surging of the water flow through auditory perception, enhancing emotional resonance. By adding interactive elements and designing mini games, micro interactive videos can be made more attractive and interesting, stimulating students' interest and participation in learning, while promoting their deep understanding and appreciation of the poem 'The Waterfall in Mount Lu Viewed from Afar'.

3.4.7 Scope of Learning Objectives

The research mainly focuses on the significance and connotation of second grade elementary school students learning Chinese poetry through watching micro interactive videos, including understanding the content of poetry, feeling the artistic conception of poetry, cultivating aesthetic taste, and improving language expression ability.

3.4.8 Scope of learning outcomes:

This study will evaluate the impact of micro interactive videos on learning outcomes, including the acquisition of new knowledge, understanding of ancient poetry history and traditional Chinese cultural content, and increasing interest in learning ancient poetry.

3.4.9 Scope of Participation:

This study investigates the main scope of visitor participation, including opinions on micro interactive video design elements, results of micro interactive video usage experience, and evaluation of micro interactive videos.

3.4.10 Design and Technical Scope:

The study will analyze the design considerations and technologies used in micro interactive videos, with a focus on user friendliness, accessibility, personalization, and technology integration to enhance the overall experience of second grade students.

3.5 Research Tools

Research tools are tools or methods used to collect data and information for conducting research. In the context of micro interactive videos of Chinese primary school students learning the connotations of ancient poetry, various research tools can be used to collect data from stakeholders and evaluate the impact of micro interactive videos on learning outcomes and overall satisfaction. Here are some research tools that can be used for this study:

3.5.1 Investigation:

In order to collect quantitative data on micro interactive videos, a survey was conducted on the learning problems and needs encountered by students, including the current problems in learning ancient poetry and the demand for micro interactive video production, in order to design and develop. Investigate the effectiveness of micro interactive videos of ancient Chinese poetry in improving the learning

outcomes of participants, as well as the quality of micro interactive videos of ancient Chinese poetry for Chinese elementary school students.

3.5.2 Interview:

In depth interviews with four Chinese language teachers who teach ancient poetry can provide valuable qualitative insights, understand their views and needs on the problems students face in learning ancient poetry, and micro interactive videos. Interviews can delve into the main problems that second grade elementary school students currently face in learning ancient poetry, as well as their opinions and suggestions on micro interactive videos. Helps with the design and creation of micro interactive videos.

Collect the content design, video interaction design, and interface design of micro interactive videos from three experts and scholars to evaluate the quality of micro interactive videos.

3.5.3 Pre testing and Post testing:

To evaluate the learning outcomes of Chinese elementary school students in micro interactive videos of ancient Chinese poetry, pre - and post learning tests can be used. Verify learning outcomes by comparing pre - and post learning tests.

This design is used to evaluate the pre-test and post-test questionnaires for Chinese primary school students to learn ancient poetry micro-interactive videos. The following steps and principles will be followed to ensure the validity and reliability of the test:

- 1) Determine the test objectives: First, clarify the objectives of the test, that is, the test needs to evaluate the learning outcomes of students before and after watching the micro-interactive videos. According to the teaching objectives, the test mainly targets the understanding and memory of ancient poetry.
- 2) Maintain consistency between pre-test and post-test: In order to be able to compare the changes in the test scores before and after, the same questions are used in the pre-test and post-test.

3.5.4 Develop micro-interactive videos

Micro-interactive videos can be used as an important tool for multimedia-assisted teaching methods through development, which can improve students'

understanding of poetry through interaction and provide support for the collection of subsequent quantitative and qualitative data.

The choice of research tools depends on the specific objectives and stakeholders of the research. The combination of quantitative and qualitative methods can comprehensively understand the effects and influences of micro interactive videos of ancient Chinese poetry. The data collected through these methods will help make informed decisions and continuously improve interactive videos to enhance learning outcomes.

3.6 Quality of Development and Validation Research Tools

In order to develop and validate the quality of micro interactive video research tools for Chinese ancient poetry, we will outline each research tool and discuss the steps to ensure its reliability and effectiveness:

3.6.1 Investigation

1) Development:

1.1) Determine the research objectives and specific information required to solve the research problem.

1.2) Draft survey questions based on research objectives, ensuring that the questions are clear, concise, and unbiased.

1.3) Conduct a pilot test of the survey questionnaire on a small group of participants to identify any ambiguities or issues in the questions.

1.4) Revise the survey form based on feedback from pilot testing and expert opinions to improve the quality and relevance of the questions.

2) Verify quality:

2.1) Use Cronbach's alpha and other techniques for reliability analysis to ensure internal consistency of survey questions.

2.2) Compare the answers with known facts or established measurement methods related to the research topic to validate the survey.

2.3) Evaluate the construct validity of the survey by examining the relationships between different survey items and their consistency with the research theoretical framework.

2.4) Conduct a questionnaire survey on some participants twice to evaluate the consistency of their answers over a period of time, in order to conduct a retest reliability study.

3.6.2 Interview:

1) Develop:

1.1) Develop a structured interview protocol, including open-ended and closed ended questions related to the research objectives.

1.2) Conduct pilot testing of the interview protocol with a small group of participants to identify any potential issues, ensure clarity, and make corresponding improvements to the issues.

1.3) Allow participants to share detailed insights and experiences on the interactive environment of Luoyang Museum in the questions.

2) Quality verification:

2.1) Multiple researchers independently code and analyze some interview records to ensure consistency in data interpretation and establish reliability among researchers.

2.2) Share interview results with participants to verify the accuracy of their answers and explanations, in order to conduct member checks.

2.3) By comparing interview data with other research tools such as surveys and observations, using data triangulation to confirm data consistency and reinforce research results.

3.6.3 Pre test and post test:

Evaluate the impact of micro interactive video design on students' learning outcomes. The process is as follows

1) Poetry selection and content selection: Select specific ancient poems, design micro content and interactive video elements, and conduct pre-test and post test evaluations.

2) Development problem: Create a mixture of multiple-choice, yes/no questions to address key poetic elements covered in micro content and interactive videos.

3) Pre-test: Conduct pre testing on participants before interactive video intervention.

4) Post test: Conduct a post test after intervention to evaluate students' understanding and memory of the ancient poetry they have learned.

5) Data analysis: Compare pre-test and post test scores to quantify the improvement in learning outcomes. Statistical analysis can provide insights into the effectiveness of interactive video methods.

3.6.4 Process of developing micro-interactive videos

1) Preliminary analysis

Based on the analysis of the feasibility and needs of applying micro-interactive videos to the learning of ancient poetry by second-grade primary school students, it is clarified that the learning of ancient poetry should adhere to the principles of concise content, lively and fascinating, plus positive interactive feedback and appropriate entertainment design elements. These factors stimulate students' interest and help them understand ancient poetry.

At the same time, several key principles need to be combined to optimize the design. First, content selection and conversion are the core tasks based on multimedia learning theory. We should select ancient poems that are suitable for second-grade students to understand, and present the poems through multiple sensory channels such as vision and hearing. For example, dynamic animations are used to display the images in ancient poems, such as mountains and rivers, and combined with reading aloud, so that students can perceive the artistic conception of the poems through both vision and hearing.

Secondly, scene construction and interactive design should be integrated into situational cognition theory. In order to help students learn ancient poems in real situations, videos can be used to simulate the natural or historical scenes described in ancient poems, so that students can enhance their understanding of the content of the poems through immersive experience. Interactive design is also an important part. Students can click on elements in the video to further explore the meaning and details behind the poems.

Finally, the feedback mechanism and learning assessment combine the concepts of feedback and reinforcement theory. In the video, an instant feedback function is designed so that students can receive positive or improved feedback immediately after completing the interactive task. This feedback can stimulate students' interest in

continuing to learn and gradually internalize the content of the poem through repeated practice.

1.1) Teaching Objectives of ' Viewing the Lushan Waterfall '

According to the new curriculum standards, teaching objectives are divided into three dimensions: knowledge and skills, processes and methods, and emotional attitudes and values. In the Chinese language classroom of second grade elementary school, taking " Viewing the Lushan Waterfall " as an example, we can determine the three-dimensional objectives of auxiliary classroom teaching as:

1.1.1) Knowledge and skills: Students are able to master the basic knowledge of " Viewing the Lushan Waterfall ", such as the author, dynasty, poetry background, etc; Be able to read and recite poetry correctly; Ability to understand key vocabulary and imagery in poetry.

1.1.2) Process and Method: Students are able to deeply understand the artistic conception and emotions of poetry through reading, discussion, writing, and other methods; Being able to learn to appreciate natural landscapes and cultivate a sense of natural beauty.

1.1.3) Emotional attitude and values: Students can cultivate an interest in literary works and enhance their confidence in reading; By studying ' Viewing the Lushan Waterfall ', students can experience the magnificence of nature and cultivate an emotional attitude of loving nature and cherishing resources; At the same time, students can understand the poet's yearning and pursuit for a better life, and cultivate a positive attitude towards life.

1.2) Functional Structure Design

The researcher organized the functional structure of interactive videos by extracting user core demands and clustering functional modules into two categories: knowledge acquisition and interactive experience. The interactive experience was further divided into audio-visual experience and diverse interaction, while knowledge acquisition was subdivided into knowledge explanation, Q&A feedback, and achievement evaluation.

Created five types of functional modules: (1) Multimedia forms of teaching content that integrated text, images, audio, and video based on textbook content and teaching objectives to enhance students' audio-visual experience; (2) Multiple

interactive modes during the viewing process to increase learning enthusiasm and participation; (3) Animation to simulate scenes from ancient poetry, explain knowledge points, and provide feedback on students' learning performance; (4) Pre-test and Post-test class exercises to consolidate knowledge and assess mastery; and (5) An achievement evaluation module that provided positive feedback by analyzing students' interaction levels and accuracy in answering questions, thereby satisfying their sense of achievement.

The functional modules were centered around teaching content and aimed to meet basic teaching needs. Principles such as clarity, real-time feedback, challenge, balance between education and entertainment, and contextuality guided the design of interactive and Q&A challenges, which enhanced students' participation and immersion. Ultimately, visual

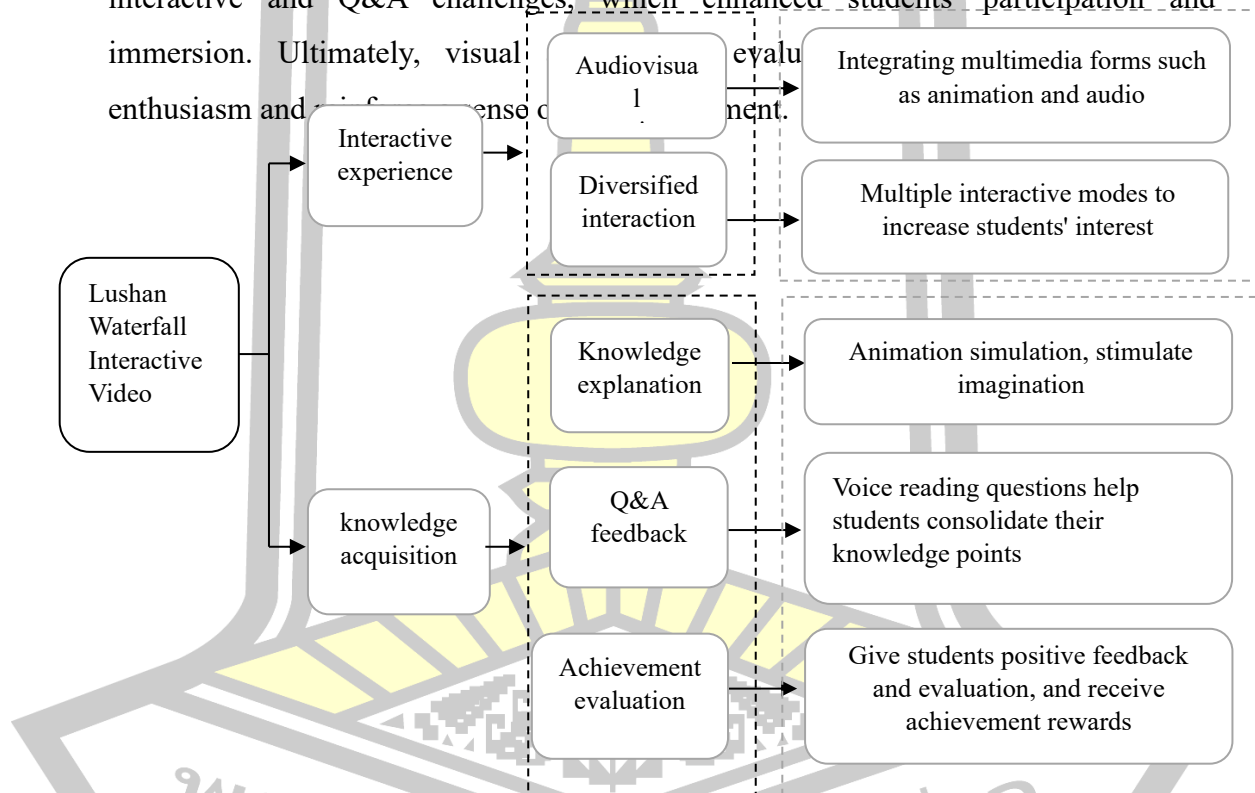


Figure 5 Design Architecture

1.3) Interactive Video Information Architecture

After determining the product functions, it is necessary to build a product architecture that abstracts the visualized concrete product functions into a modular and clear hierarchical architecture, and combines them in layers to convey the product

design ideas. Jesse James Garrett's "User Experience Elements" states: "Information architecture focuses on designing structures for organizing, categorizing, and navigating tasks to enable users to efficiently complete them." (Garrett, 2008) This interactive video product is primarily intended for elementary school students, and its design should highlight core functionality and avoid accessing content at a too deep level. The simpler the functional architecture, the shorter the operation process, and the less likely learners' emotions are to be interrupted. For elementary school students, adding content unrelated interactive operations is not conducive to experiencing complete and smooth information. Therefore, this interactive video design adopts a linear structure product architecture, with a clear knowledge system and experiential framework to provide learners with a good learning environment, allowing learners to fully immerse themselves in learning and even lose their perception of time. The specific product information architecture is shown in Figure 4.2

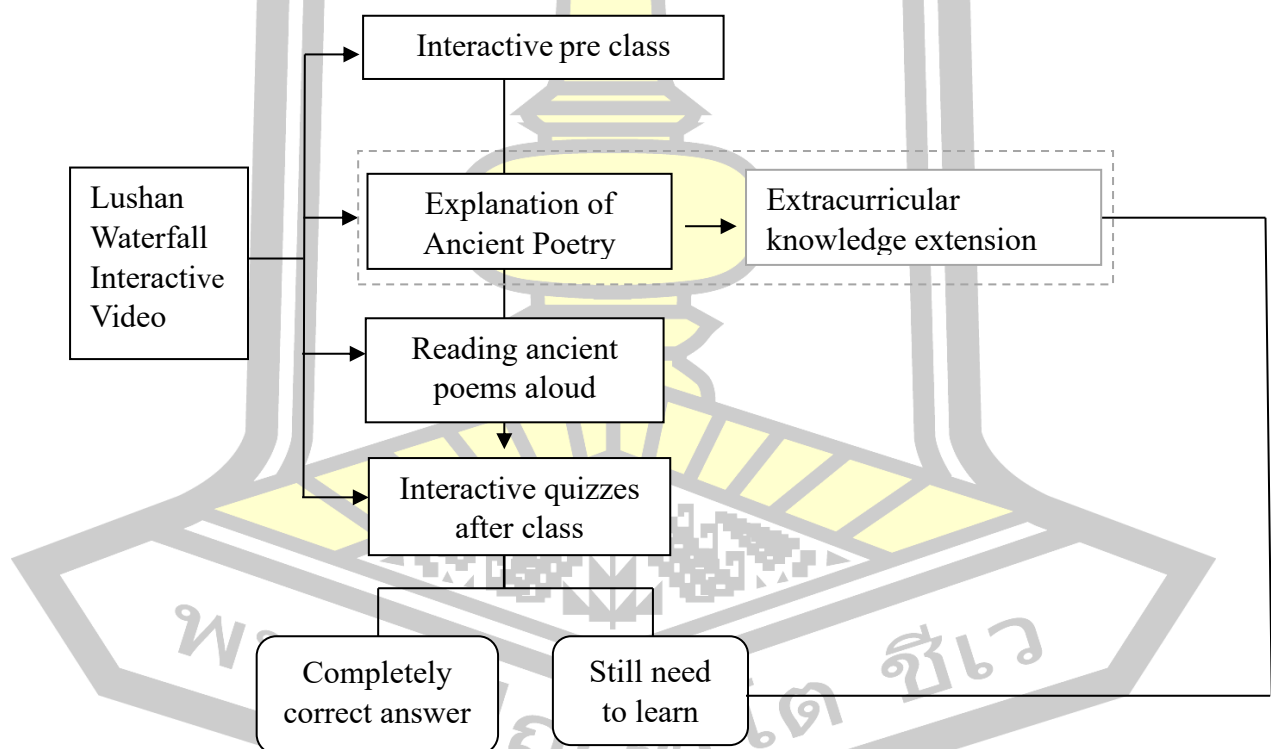


Figure 4.2 Interactive Video Information Architecture

2) Video Content Design

Table 4.5: Outline Design of Micro Interactive Video Script

Outline Design of Micro Interactive Video Script						
number	content	concrete content	Video effects	Speech design	duration	Design intent
1	Before class Pre-test	There are a total 10 questions (see attachment for questions)	Voice playback		20S	Understand students' basic knowledge of this lesson
2	ancient poetry speak solution	The meaning of the poem title	Music, animation The presentation form	The title of the poem is 'Viewing the Lushan Waterfall', it turns out to be written like this, like a person standing on the ground looking at the moon, the original intention is to look into the distance. The meaning of the poem title is to view the Lushan Waterfall from a distance	20S	Create scenarios to attract students' interest
3		Author	Music,	Li Bai, also	8S	Interactive

Outline Design of Micro Interactive Video Script						
number	content	concrete content	Video effects	Speech design	duration	Design intent
		Introduction	animation The presentation form	known as Taibai and Qinglian Jushi, is hailed as a poetic immortal. "		timing design: Li Bai's extracurricular knowledge expansion
4		Reading ancient poems aloud	Music, animation The presentation form	Read ancient poetry sentence by sentence and indicate breaks.	74S	Dubbing lead reading, guiding students to read correctly
5		Analysis of Ancient Poetry	Music, animation The presentation form	Display each line of poetry according to the narration description, accompanied by corresponding visuals	69S	Create scenarios to promote students' understanding of ancient poetry and literature, and stimulate their imagination.
6		Interactive quiz	Music, animation The presentation form	There are three interactive questions, mainly covering three aspects: 1. Use humorous and witty Q&A explanations to help students understand Lushan Waterfall	116S	Interactive timing design: Expand more extracurricular knowledge in Lushan. Enable students to understand the magnificent mountains, rivers, and splendid culture of their

Outline Design of Micro Interactive Video Script						
number	content	concrete content	Video effects	Speech design	duration	Design intent
				<p>2. By explaining the word "three thousand feet", students will understand the method of exaggeration in writing.</p> <p>3. Through the explanation of "the purple smoke produced by the Rizhao incense burner", students will understand the writing method of metaphor.</p> <p>4. Stimulate students' exploration of the allusions of "the Milky Way" and "the Nine Heavens" that lead to the suspicion of "the Milky Way falling to the Nine Heavens",</p>		<p>motherland, and inspire them to love their country.</p> <p>Guide students to understand the writing methods of exaggeration and metaphor, and feel the charm of ancient poetry</p> <p>Motivate students to maintain their interest in learning. Inspire students' understanding of Chinese allusions. Understand ancient Chinese knowledge, and then feel the charm of ancient poetry and appreciate the profoundness of traditional Chinese</p>

Outline Design of Micro Interactive Video Script						
number	content	concrete content	Video effects	Speech design	duration	Design intent
				and enable students to have a deeper understanding of the meaning of ancient poetry.		culture.
7	After class Post-test	There are a total of 10 questions (see attachment for questions)	Voice playback	There are a total of 10 questions, which include knowledge from ancient poetry explanations		Interaction timing design: Set interaction options, encourage correct answers with animations, and automatically jump to the next question if answered incorrectly. Purpose: To understand students' mastery of this lesson.

In the pre class test, one point will be awarded for each correct answer. After completing the answer, determine the test score based on the number of stars (as shown in the figure). The post class practice session follows the principle of positive motivation feedback. If you answer incorrectly, you will automatically jump to the next question. If you answer correctly, a cute animation will pop up to motivate you. After class exercises were set up with a total of 6 questions, each worth one point. The test results are divided into three levels: 1-2 points, 3-4 points, and 5-6 points. The specific feedback is as follows:

1-2 points: Display "Learn again!" and provide a button to relearn.

3-4 points: Display "Children should study seriously!" and provide a button for relearning.

5-6 points: Display "I've learned everything, you're amazing."

The production of this micro interactive video includes three parts: material collection and production, interactive video production, and video generation. This article selects the Bilibili website as the platform for producing micro interactive videos based on the analysis of interactive videos in the previous chapters.

3) Production of Video Materials

Due to the use of special algorithms to connect multiple videos in interactive videos, the video resources that make up interactive videos can be short videos, movie clips, news reports, documentary clips, or videos recorded by teachers or students themselves, as well as animations. However, video resources must be saved on local computers in order to be produced in the interactive video production center on the Bilibili website.

The main sources of materials for the micro interactive video of the ancient poem 'Looking at the Lushan Waterfall' include three categories: animation production for the knowledge explanation section, production of interactive question videos, and downloading of extracurricular knowledge materials.

3.1) Knowledge explanation section

According to the psychological characteristics and needs of second grade children, the knowledge point explanation section is made using animation. Animation design is one of the core contents of this interactive teaching video. Research has shown that animation can promote students' conceptual understanding and reasoning abilities. When designing teaching animations, it is necessary to connect learning materials with students' daily lives, present humorous and interesting scenes, and emphasize oral narration, textual prompts, and scientific thinking. The visual design of interactive videos should meet the aesthetic needs of learners and enhance their immersion. In terms of animation drawing, the popular 2D flat animation form was chosen and produced using Adobe Animate software. This form can freely combine various graphics, highlight information in an abstract, minimalist,

and symbolic way, and has a large information carrying capacity. In interactive videos of ancient poetry, animations are used to restore the visuals, interactive effects, and transitions of ancient poetry, and the selected content is related to the learners' daily lives. The virtual characters and character images in animation are matched with learners' cognition, and the language of animation shots is rich. By reasonably splicing different scenes and angles of the picture, adjusting the speed of shot switching, a rhythmic shot language is formed. Due to the fact that this interactive video mainly focuses on knowledge explanation with less narrative plot, the rhythm of the visuals mainly relies on the clever combination of visual elements, giving the video a sense of rhythm and visual impact. (Figure 4.3)



Figure 6 Animation material production interface

3.2) Setting up interactive questions

The video material for the interactive question section was created using the video editing software "Silhouette". During the production process, multimedia elements such as images, text, music, and animations were added to create materials for the interactive question section, including questions, voice, and score animations. These interactive questions are mainly set during pre class testing and post class practice sessions. Video editing interface in Figure 4.4

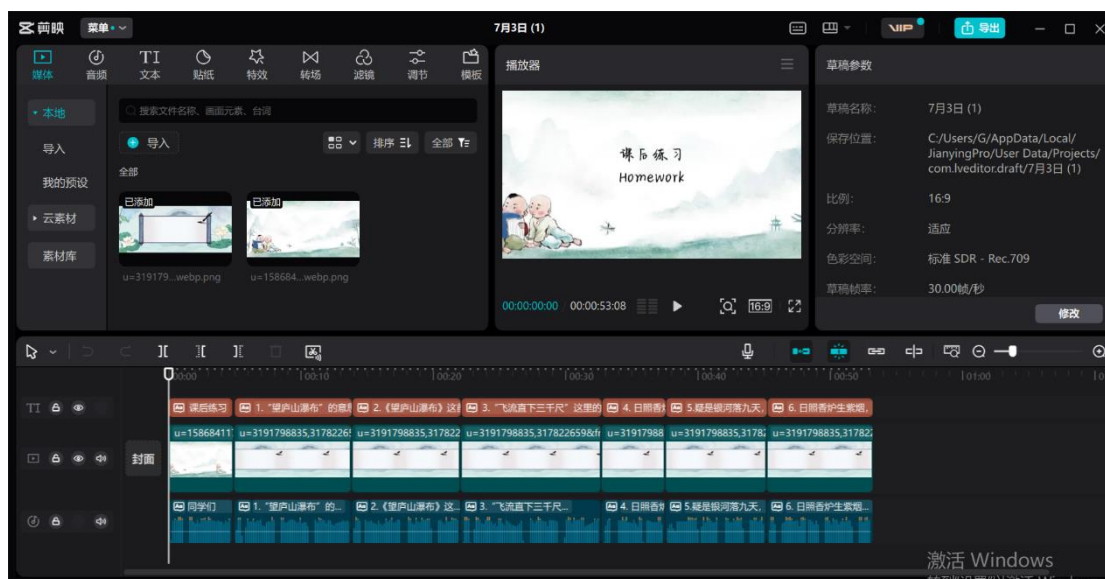


Figure 7 Video editing interface

3.3) Download extracurricular knowledge materials

With the development of technology, online resources are becoming increasingly advanced, and there are many learning materials for ancient poetry and related materials that can be used. These materials not only provide explanations or applications of knowledge points, but also showcase many videos of humanities and nature. Like the YouTube that people often use (<https://www.youtube.com/>) TikTok (www.tiktok.com), iQiyi Video Website (<https://www.iqiyi.com/>) Bilibili (www.bilibili.com/) and other websites offer videos that can be watched online, as well as downloaded and saved on computers and mobile devices. But most websites require the installation of their computer or mobile client for video downloads to be supported. If unable to download, you can use screen recording or plugins to download. It should be noted that downloading and reposting videos must be approved by the author themselves, and the source should be indicated when broadcasting.

3.4) Interactive Video Production Process

Based on the teaching content, edit the produced materials according to the video's parts, splice and crop them, and add subtitles, background music, and animation settings to some segments. During this process, set animation jumps to enhance the video's effect.

After preparing the relevant video materials, you can proceed with the production of interactive videos. Firstly, enter the creation center of the Bilibili website, click on "Submit" - "Interactive Video Submission" in the upper left corner of the webpage, as shown in Figure 4.5, and click on "Upload Video" in the middle to import relevant videos.



Figure 8 Import video interface

After importing the video, click "Submit Now" below to enter the content article management, and then you can enter the World Line Editor, as shown in Figure 8. Worldline is an editor used to create and edit interactive videos, providing timeline editing functionality that allows users to add and edit video clips on the timeline, adjust the start and end points of clips, and control the playback order and duration of videos. At the same time, the World Line Editor supports multi branch plot design, allowing users to create multiple plot paths and allowing viewers to enter different plot branches according to their own choices, thereby enhancing the interactivity and participation of the video.





Figure 10 Plot Module Settings

The plot branch has text options and point positioning options. The text options are a traditional presentation mode, where the position of the options is fixed, as shown in the above figure 9; The latter is the ability to adjust the position of options, usually used to cultivate students' ability to read and recognize images. In this design, buttons were set up on Li Bai and Lushan Waterfall to arouse students' interest in learning extracurricular knowledge. This interactive video features two parts of challenge questions. After importing the first question video, the corresponding number of plot branch options will appear based on the set number of branches. As shown in Figure 4.8, if the author has set four options, four option editing boxes will appear when editing the options, You can enter different option names or text here.

剧情模块 取消更改 应用

剧情分支选项 Plot-branching-options

选项A>剧情模块: 暂未设置

请输入... Plot-Module-A

选项B>剧情模块: 暂未设置

请输入... Plot-Module-B

选项C>剧情模块: 暂未设置

请输入选项名称...

选项D>剧情模块: 暂未设置

Figure 11 Setting of Plot Branch Options

Advanced features can be set for branch options, such as hiding numerical values. As shown in Figure 4.9 Record user choices and interactive behaviors in the background instead of displaying them in the foreground. This feature can record user selected data and track user behavior and decision-making paths in videos, providing data support for personalized experiences. In addition, the hidden value function can dynamically adjust the development direction of the plot according to the user's selection, ensuring that the interactive video content is more in line with the user's needs and improving the viewing experience. Meanwhile, the collected user data can be used for further analysis and optimization of video content, achieving higher interactivity and engagement.

In the answer section, set a value of 1 plus one point for each correct answer. After answering, different video content will be displayed for different scores. Figure 12 is the flowchart of the answer video.



Figure 12 Advanced Features

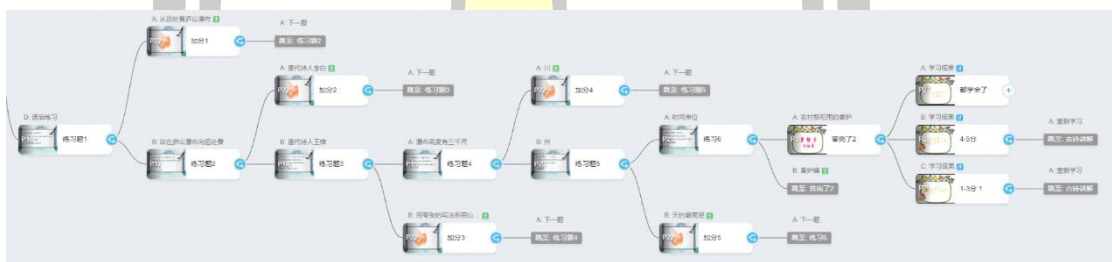


Figure 13 Answer video flowchart

4) Micro interactive video generation

Upload the completed and edited interactive video to the video website Bilibili. Fill in relevant information during the upload process. submission, wait for official review from Bilibili. Once approved, the interactive video can be officially released.

There are usually two ways to post a notification for the release of a micro-interactive video:

(1) Follow the account

Students can apply for the account of B station, through the web version or APP version, search and follow the released video account, that is to say, they can study within the released video account, and at the same time, after following the released

video account, they can also receive software reminders if there is new content released.

(2) Direct Sharing

You can also directly share the content you want to share to various social platforms such as QQ, WeChat, etc. through the video sharing function to directly remind students to access.

After release, as shown in Figure 4.11

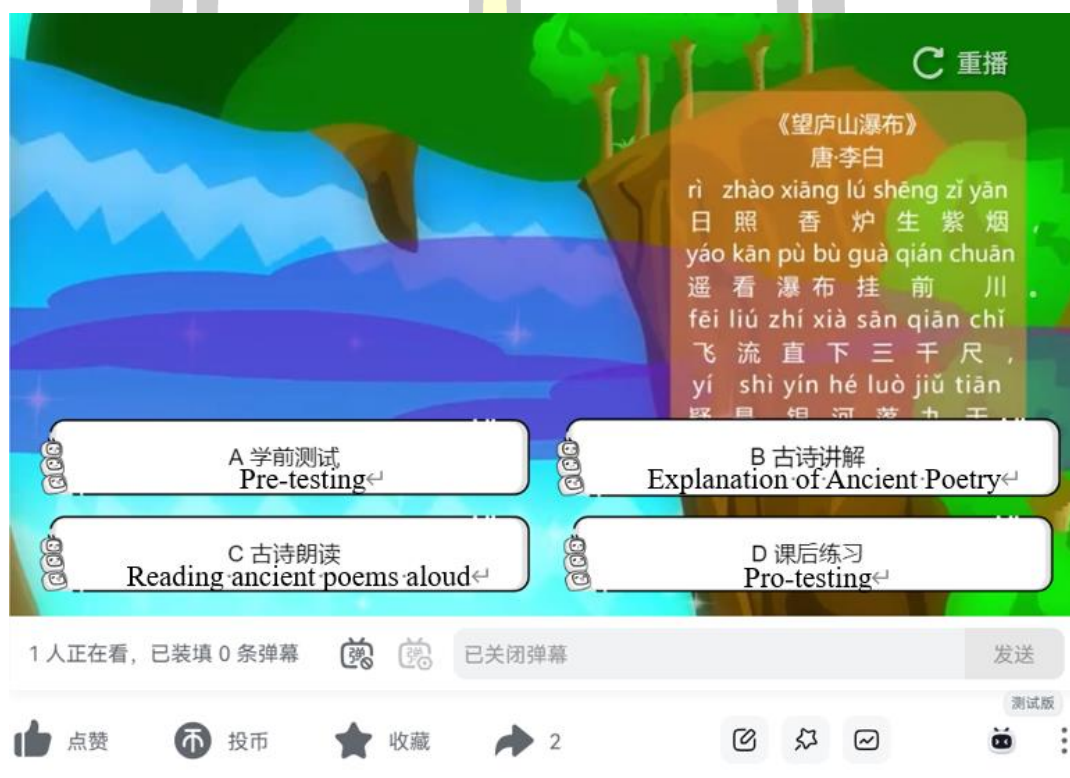


Figure 14 Video publishing interface

Ensure that the design of research tools captures the specific aspect you are studying. Trying out these tools before full implementation can help identify and solve any problems, ensuring the reliability and effectiveness of the data collection process.

Through rigorous development and validation processes, the quality of research tools (surveys, interviews, pre - and post learning tests) can be ensured. Effective and reliable research tools are crucial for collecting accurate and meaningful data, enabling this study to effectively achieve its research objectives and contribute valuable insights to the field of interactive videos of Chinese ancient poetry.

3.7 Experimental Action Plan:

Preparation stage: Select a suitable sample group, including students of different ages and learning backgrounds. Prepare micro interactive videos related to ancient poetry.

Implementation stage: Share micro interactive videos with the sample group of second grade elementary school students. Ensure that students can easily access and use these technologies.

Evaluate learning outcomes: Evaluate learning outcomes through questionnaire surveys, pre-test and post test assessments. Compare the changes in knowledge level before and after use.

Collect feedback: Collect students' satisfaction and feedback on micro interactive videos through online surveys and pre - and post testing.

Data analysis: Conduct quantitative and qualitative analysis on the collected data to determine the impact of micro interactive videos on second grade primary school students.

Report and improvement: Write a detailed report based on the analysis results, summarize the experimental results and recommendations. Make necessary adjustments based on feedback to optimize future interactive displays. Provide reference and inspiration for future similar research. The above implementation plan aims to comprehensively evaluate the effectiveness of micro interactive videos in Chinese primary school students' learning of the meaning of Chinese poetry, and provide empirical support for the improvement and innovation of poetry education.

3.8 Data Collection

3.8.1 Investigation data collection steps:

1) Contact the school leaders of Longyi Primary School and request their assistance and cooperation in obtaining permission to collect data from the teaching experiment sample group.

2) The survey questionnaire is divided into a pre experiment questionnaire and a post experiment questionnaire. The pre experiment questionnaire was distributed to 140 second grade students at Longyi Elementary School, and with the help of their

parents, the questionnaire was sent to them to fill out. Post experiment questionnaire: Randomly select a second grade class for the experiment and distribute the questionnaire to the experimental class for data collection.

3) Distribute questionnaires to parents through the online survey platform "Wenjuanxing", collect data through the platform, and conduct preliminary analysis.

In the process of collecting information related to children, the consent of participants, parents, or guardians must be obtained before conducting any data collection activities. The researchers ensured the confidentiality and privacy of the participants throughout the entire data collection process. Comply with ethical guidelines and institutional policies regarding research involving minors.

Therefore, in the process of collecting this information, researchers will be able to gather comprehensive and relevant data to achieve their research goals and help understand the effectiveness of micro interactive video research on Chinese primary school students learning the meaning of Chinese poetry.

3.8.2 Interview

1) Data collection method: Conduct in-depth interviews with four teachers who teach ancient poetry at Longyi Primary School. The interviews will be conducted via phone or video conference based on the participants' time and preferences. The interview may mainly be conducted online.

2) Data collection program:

Develop a structured interview plan based on quality validated interview tools. Arrange interview times with participants and obtain their informed consent. Conduct interviews to ensure open communication in a comfortable and confidential environment. Record interviews (with permission) for accurate transcription and analysis of data. Make detailed on-site records during the interview process to capture nonverbal cues and background information. Thank the participants for their time and contributions.

3.8.3 Data collection steps before and after the experiment:

1) Select Chinese poetry and design micro content and interactive video elements for pre-test and post test evaluation.

2) To evaluate the consistency of development with the content covered in micro content and interactive videos before and after testing.

- 3) Conduct a pre-test on the selected sample of elementary school students.
- 4) Implement intervention according to plan (referring to the pre made micro interactive video of ancient poetry)
- 5) After intervention, conduct a post test on the same group of students.
- 6) Collect completed pre-test and post test evaluations, and ensure that all questions are accurately answered.
- 7) Compile the evaluation data into a structured format for analysis.

In the process of collecting information related to children, the consent of participants, parents, or guardians must be obtained before conducting any data collection activities. The researchers ensured the confidentiality and privacy of the participants throughout the entire data collection process. Adhere to ethical guidelines and institutional policies regarding research involving minors.

Therefore, in the process of collecting this information, researchers will be able to gather comprehensive and relevant data to achieve their research goals and help understand the effectiveness of interactive sub content and video design in primary school students' Chinese poetry learning.

3.9 Data analysis.

To ensure the accuracy and representativeness of the research results, this study conducted a survey on Chinese ancient poetry teachers and second grade primary school students. This study adopts a mixed research method, and the specific research methods are as follows

3.9.1 Investigation

1) Data analysis method: The data collected through the survey will be analyzed using statistical software such as SPSS (social science statistical software package). We will analyze the quantitative data obtained from the survey to gain meaningful insights and draw conclusions related to the research objectives.

2) Data analysis program:

2.1) Data cleaning: Remove any incomplete or inconsistent survey responses to ensure the accuracy and reliability of the data.

2.2) Descriptive statistics: Calculate descriptive statistics such as mean, median, standard deviation, and frequency distribution to summarize survey data.

2.3) Inferential statistics: Conduct inferential statistical tests, such as t-tests or correlation analysis, to explore the relationships between different variables and evaluate the significance of the results.

2.4) Data visualization:

Create charts, graphics, and visual representations to present survey results in a clear and understandable format.

3.9.2 Interview

1) Data analysis method: Qualitative data obtained from interviews will be analyzed using thematic analysis. Theme analysis is a systematic method for identifying patterns, themes, and categories in interview data.

2) Data analysis program:

2.1) Transcription: Copy interview records verbatim for data analysis purposes.

2.2) Familiarity: Read through the interview records and gain a comprehensive understanding of the data.

2.3) Encoding: Designate codes for text fragments representing important concepts, viewpoints, and themes.

2.4) Theme recognition: Summarize relevant code into overall themes to identify recurring patterns and key insights.

2.5) Data interpretation: Explain the topic based on research objectives and theoretical framework.

2.6) Data Validation: By comparing the topic with the original interview data, validate the analysis results to ensure accuracy and effectiveness.

3.9.3 Pre test and post test data analysis:

Analyze the learning outcomes of Chinese ancient poetry micro interactive videos for students.

1) Data cleaning: Check and clean the evaluation data before and after testing, and resolve any errors or inconsistencies.

2) Descriptive analysis: Descriptive statistics for calculating pre-test and post test scores, such as mean and standard deviation.

3) Comparative analysis: Use appropriate statistical tests, such as t-tests, to compare pre-test and post test scores

4) Effect size: Calculate the measure of effect size to determine the actual significance of observed changes.

5) Explanation: Explain the results of comparative analysis to evaluate the impact of interventions on learning outcomes.

3.9.4 Integration and Conclusion:

1) Integrate findings from all three data analysis processes (survey, interview, pre-test/post test) to answer research questions and draw meaningful conclusions.

2) Consider triangulation by comparing and contrasting findings from different data sources to enhance the validity of conclusions.

3) By conducting comprehensive data analysis on each research tool, researchers can gain a deeper understanding of the effectiveness of using micro interactive videos in primary school ancient poetry education, and understand students' views and experiences of this method

3.10 Statistics used in data analysis.

3.10.1 Statistical methods used in questionnaire survey data analysis:

1) Percentage: Expressing data as a percentage through calculation.

2) Mean (Average): Calculated to determine the central tendency of data.

3) Standard deviation (SD): Used to measure the degree of variation or dispersion of data.

4) Project Objective Consistency Index (IOC): Used to evaluate the consistency between a problem and its objectives or content, with a numerical range of 0.00-1.00

3.10.2 Statistical methods used for pre-test and post test:

1) Mean (Average): Calculated to determine the central tendency of data.

2) Standard deviation (SD): Used to measure the degree of variation or dispersion of data.

3) Dependent sample t-test: used to compare whether there is a significant difference in the mean of two related samples.

The above statistical methods can help researchers analyze questionnaire surveys in depth, understand students' reactions and effects on micro interactive video learning, as well as the actual situation of classroom teaching, thereby providing data support for teaching improvement and in-depth research.

Chapter 4

Results

The research was titled " Micro Interactive Video to Learning the Meaning of Chinese Poetry for Primary School Students in China". The researcher presented the research findings in 4 parts as follows:

Part 1: Findings the problem and need for micro-interactive videos to learn the meaning of Chinese poetry for primary school students in China

Part 2: Outcomes of the development of micro interactive video for learning the meaning of Chinese Poetry for primary school students in China

Part 3: Pre-test and post-test comparison of Chinese primary school students' learning outcomes in understanding the meaning of Chinese poetry.

Part 4: The learners' satisfaction with the interactive micro-videos designed for learning the meaning of Chinese poetry

Part 1: Findings the problem and need for micro-interactive videos to learn the meaning of Chinese poetry for primary school students in China

Regarding understanding the current situation and learning needs of primary school students in learning ancient Chinese poetry. Views, attitudes, and preferences towards designing micro interactive videos in Chinese poetry education. The research results are divided into two parts. The first part is feedback from 115 second grade students, and the second part is feedback from 4 teachers who teach Chinese ancient poetry. The results are as follows:

1. Survey results on problems in teaching the meaning of ancient Chinese poetry and the need for micro-interactive videos among second-grade primary school students in China

Table 3 Basic information of the respondents: 115 Grade 2 students

Items	Category	Number of persons	Percentage
Grader	Male	58	50.43
	Female	57	49.57
Total		115	100
Age	7 years old	19	16.52
	8 years old	69	60
	9 years old	27	23.48
Total		115	100
Grade level	Year 2 Class 1	30	26.09
	Year 2 Class 2	30	26.09
	Year 2, Class 3	25	21.74
	Year 2, Class 4	30	26.09
Total		115	100

From the information in Table 4.1, it can be seen that there are a total of 115 basic data for second grade students, with more boys than girls providing information, accounting for 50.43%. The majority of second grade students are 8 years old and come from classrooms 2/1, 2/2, and 2/4, accounting for 26.09% each. For more details, please refer to the table below.

Table 4 Percentage of problems faced by 115 second-grade students in understanding the meaning of ancient Chinese poetry

No.	Problems assessment items	Problems faced by percentage	
		n=115	
		Yes	No
1	Poetry lessons are interesting.	83.48	16.52
2	It is important to learn poetry.	78.26	21.74
3	It is difficult to understand the meaning of ancient Chinese poems.	75.65	24.35
4	Learning with interactive videos is interesting.	75.65	24.35
5	I enjoy learning about ancient poetry.	74.78	25.22
6	I take the initiative to preview and review ancient Chinese poems.	73.91	26.09
7	I am interested in learning ancient poems in	72.17	27.83

No.	Problems assessment items	Problems faced by percentage	
		n=115	
		Yes	No
	my language class.		
8	It is hard to understand the thoughts and feelings expressed by the writers when studying ancient poems.	70.43	29.57
9	Teachers use multimedia to teach ancient poems.	69.57	30.43
10	When learning poetry, I prefer to watch videos rather than just rely on the teacher's verbal explanations or pictures.	66.96	33.04
11	For the most part, I preview and review ancient Chinese poems with video materials.	65.22	34.78
12	I would like my teacher to use interactive videos to help me understand ancient Chinese poems.	65.22	34.78
13	I can't imagine the picture of an ancient poem when studying it.	61.74	38.26
14	I am satisfied with the current teaching methods.	51.30	48.70
15	The current media used to teach poetry is interesting.	35.65	64.35
Total average		68.52	31.48

From Table 4, it can be seen that 115 second grade elementary school students answered the difficulties they encountered in learning ancient poetry based on 15 questions. The study found that overall, 68.52% of students encountered learning difficulties. From the perspective of problem hierarchy, the top five ranked issues are as follows:

Rank 1: 83.48% of second grade students find poetry lessons interesting.

Rank 2: 78.26% of students think it is important to learn poetry.

Rank 3: 75.65% of students think it is difficult to understand the meaning of ancient Chinese poems.

Rank 4: 75.65% of people find it interesting if you learn with interactive videos

Rank 5: 74.78% of people enjoy learning about ancient poetry.

Other projects are arranged in descending order based on their respective percentage values, as shown in table 4.2.

Table 5: Percentage of the need for micro-interactive video usage to learn the meaning of Chinese poetry for second-grade elementary students.

No.	Need assessment items	Need by percentage	
		N=115	
		Yes	No
1	I want narration while learning an ancient poem with micro-interactive videos.	87.83	12.17
2	I like it when my teacher explains the meaning of ancient poems with cartoon slides.	80	20.00
3	I need an interactive video game to help me learn poetry.	76.52	23.48
4	Using micro-interactive video lessons helps to increase interest in learning an ancient Chinese poem.	75.65	24.35
5	I want a soundtrack when learning an ancient poem through a micro-interactive video.	74.78	25.22
6	I need a short message in a micro-interactive video that describes the meaning of the poem in detail.	73.91	26.09
7	I want a micro-interactive video that explains the meaning of an ancient poem.	73.91	26.09

No.	Need assessment items	Need by percentage	
		N=115	
		Yes	No
8	I want a fast-moving cartoon that explains the meaning of poems in a micro-interactive video.	73.04	26.96
9	Learning the meaning of a Chinese poem from micro-interactive videos improves my learning.	73.04	26.96
10	Using micro-interactive videos is helpful in learning the meaning of an ancient poem.	71.30	28.70
11	It is easier to learn an ancient poem using micro-interactive videos.	71.30	28.70
12	I need micro-interactive videos while learning ancient poetry.	70.43	29.57
13	I like learning through micro-interactive videos.	68.70	31.30
14	I want to learn through lively and cute interactive videos.	68.70	31.30
15	I have used an educational interactive video product.	64.35	35.65
Total average		73.56	26.44

Table 5 shows the responses of 115 second grade elementary school students regarding their preference for using interactive short videos to learn the meanings of ancient poetry. Based on 15 questions, the study found that overall, students have a preference for interactive short videos at 73.56%. In terms of preference level, the top five preferences are as follows:

Rank 1: 87.83% of students want a narration while learning an ancient poem with micro-interactive videos.

Rank 2: 80% like it when your teacher explains the meaning of ancient poems with cartoon slides.

Rank 3: 76.52% need an interactive video game to help you learn poetry.

Rank 4: 75.65% think using micro-interactive video lessons helps to increase interest in learning an ancient Chinese poem.

Rank 5: 74.78% want a soundtrack when learning an ancient poem through a micro-interactive video.

Other items are ranked in descending order based on their respective percentage values, as shown in Table 5

2. Survey results on problems in teaching the meaning of ancient Chinese poetry and the need for micro-interactive videos among teachers

Through interviews with teachers, we learned about the challenges that Chinese second grade students face when learning ancient poetry and their demand for micro interactive videos.

Table 6 Basic information of the respondents: 4 teachers teaching ancient Chinese poetry

Items	Category	Number of persons	Percentage
Grader	Male	0	0
	Female	4	100
Total		4	100
Age	26-31 years old	2	50
	32-37 years old	1	25
	38-43 years old	1	25
		1	25
Total		4	100
Education level	Bachelor's Degree	2	50
	Master's Degree	2	50
Total		4	100
Work experience	1-5 years	2	50
	6-10 years	1	25
	16-20 years	1	25
		1	25
Total		4	100

Items	Category	Number of persons	Percentage
Teaching experience	1-5 years	2	50
	6-10 years	1	25
	11-15 years	1	25
Total		4	100
Currently holding the position	Teacher	4	100
Total		4	100

Table 4.4 shows the basic information of four teachers. All are female, accounting for 100%. Most of them are between the ages of 26 and 31, accounting for 100%. In terms of education, 50% hold a bachelor's degree and the other 50% hold a master's degree. In terms of work experience, 50% of teachers have 1-5 years of teaching experience, and 25% of teachers have 16-20 years of teaching experience in Chinese poetry. In addition, all four teachers are formal employees, accounting for 100%.

Through in-depth interviews with teachers, two main questions were raised and relevant opinions were sorted out as shown in Table 7:

Table 7

Questions	Teacher 1	Teacher 2	Teacher 3	Teacher 4
Main Problems in Teaching Ancient Poetry	The content of ancient poetry is complex, and students lack life experience and emotional maturity to understand the deep meaning of poetry; the abstract language patterns and images are difficult for second-grade students to understand.	Students find it difficult to understand the differences between ancient Chinese and modern Chinese; the vocabulary and sentence structures in ancient poetry are too complex for them; and teaching media may not necessarily	Understanding the artistic conception of ancient poetry requires appreciation, which is beyond the students' understanding. Lack of life experience makes it difficult for students to grasp the emotions and artistic conception in	It is difficult to combine recitation with practical application, and second graders need more guidance to use ancient poems appropriately in different contexts.

		increase interest.	poetry.°	
Is it necessary to use interactive micro videos?	Interactive videos can combine visual and auditory experiences to help students understand the meaning and context of poetry, and make it easier for students to immerse themselves in it through animation and other forms.	Functions such as clicking and dragging in interactive videos can increase students' participation and help them explore and understand the rhythm, artistic conception, etc. of the poem.	Interactive videos can provide personalized learning paths. Students can adjust their learning progress according to their own needs and re-learn difficult parts, thereby enhancing their learning confidence.	The visual effects and auxiliary sounds of interactive videos can enhance learning interest, and small tests and mini-games as assessment tools can provide real-time feedback to help students adjust their learning strategies.

In summary, from the perspective of teachers, second-grade students face some problems when learning ancient poetry, including difficulties in understanding meaning, mastering complex content, and visualizing. The challenge of teaching methods, students' lack of life experience and emotional maturity, and insufficient basic knowledge lead to the emergence of overall learning problems.

The four teachers unanimously agreed that it is necessary to use small interactive videos to promote the learning of the meaning of ancient poetry by second-grade primary school students. The teachers unanimously agreed that these videos can effectively attract students' interest, help them intuitively understand the profound meaning of Chinese poetry, and enhance the overall learning experience. The implementation of diversified content, segmented teaching, interactive functions, and instant feedback is expected to improve the efficiency of ancient poetry teaching and make the learning process more vivid, interesting, and effective.

Part 2: Outcomes of the development of micro interactive video for learning the meaning of Chinese Poetry for primary school students in China

This section summarizes the quality of interactive micro-videos for Chinese primary school students to learn the meaning of ancient poems. The developed micro-

interactive videos were used to enhance the second grade students' understanding of the meaning of the ancient poem "Lushan Waterfall". The researchers introduced the development and quality evaluation results of the interactive micro-videos as follows.

The results of the quality assessment of the interactive micro-videos on ancient poetry among elementary students were evaluated by 3 experts specializing in content, design, and interactive media. The findings are presented as follows

Table 8: The quality assessment results of Micro were assessed by three experts.

Table 8: The quality assessment results of Micro were assessed by three experts.				
No.	Quality Assessment items	Measure the experts ' quality		Meaning
		n=3		
		Mean	S.D.	
Content				
1.	The micro interactive video accurately conveys the meaning of the selected Chinese poetry.	5.00	0.00	Excellent
2.	This video effectively integrates the natural cultural context.	5.00	0.00	Excellent
3.	The interpretation of the poetry is appropriate for primary school students.	4.67	0.58	Excellent
4.	The video conforms to the appropriate teaching method of Chinese poetry and attracts the attention of young learners.	4.67	0.58	Excellent
5.	The essential elements of the poetry are well-represented in the video.	4.33	0.58	Good
Total Content		4.73	0.46	Excellent
Interaction				
6.	The video's interface is intuitive, allowing easy navigation and engagement.	5.00	0.00	Excellent
7.	The interactive components reinforce the key learning objectives related to the poetry.	4.33	0.58	Good
8.	The video provides effective feedback to ensure students understand the material.	4.33	0.58	Good
9.	The interactive features are user-friendly for primary school students.	4.00	0.00	Good
10.	The interactive elements are responsive and			

	function smoothly across devices.	4.00	0.00	Good
	Total Interaction	4.33	0.49	Good
Design				
11.	The audio quality is clear and suitable for the target age group.	4.33	0.58	Good
12.	The interactive elements enhance the students' learning experience.	4.33	0.58	Good
13.	The design balances educational content with entertainment to keep learners engaged.	4.33	0.58	Good
14.	The visual design supports the comprehension of the poetry's meaning.	4.00	0.00	Good
15.	The pacing of the video maintains the attention of primary school students.	4.00	0.00	Good
	Total Design	4.20	0.41	Good
	Total all	4.42	0.51	Good

Table 8 showed the results of the quality assessment of the micro-interactive video, evaluated by three experts. Overall, the video was rated as being of good quality (Mean=4.42, S.D.=0.51). When considering individual aspects, ranked from highest to lowest average, the content aspect was rated as very good quality (Mean=4.73, S.D.=0.46). Specifically, the statements 'The micro-interactive video accurately conveyed the meaning of the selected Chinese poetry' and 'This video effectively integrated the natural cultural context' both received the highest average score (Mean=5.00, S.D.=0.00).

The second aspect, interaction, was rated as good quality (Mean=4.33, S.D.=0.49). The statement 'The video's interface was intuitive, allowing easy navigation and engagement' was rated as very good quality (Mean=5.00, S.D.=0.00). The third aspect, design, was also rated as good quality (Mean=4.42, S.D.=0.41). The statements 'The audio quality was clear and suitable for the target age group,' 'The interactive elements enhanced the students' learning experience,' and 'The design balanced educational content with entertainment to keep learners engaged' all received the highest average score (Mean=5.00, S.D.=0.00). Other items were rated as good quality, as detailed in Table 8.

Part 3: Pre-test and post-test comparison of Chinese primary school students' learning outcomes in understanding the meaning of Chinese poetry.

This section studies the learning effect of Chinese elementary school students learning ancient Chinese poetry through micro interactive videos. Knowledge point test questions are conducted before and after learning, and a unified scoring standard is used for grading. Enter the test results into SPSS software to obtain the analysis results in the following table 9.

Table 9: Analysis of pre-test and post-test scores

test	N	M	SD	t	Sig
Pre-Test	35	5.27	2.12	-16.36	0.000
Post-Test	35	7.00	2.06		

From Table 9, shows the significant improvement in grades: After learning through micro interactive videos, students' test scores for the ancient poem "Looking at the Lushan Waterfall " significantly improved, with an average increase from 5.27 to 7.00, showing a significant increase.

Significant difference: According to the results of the t-test ($t=-16.36$, $Sig=0.000$), the difference between the pre-test and post-test is statistically significant, indicating that this learning method can effectively improve students' learning outcomes.

More concentrated distribution: The standard deviation of post school test scores (2.06) has decreased compared to the standard deviation of pre school test scores (2.12), indicating that the distribution of students' grades after learning is more concentrated, and most students can achieve higher grades after learning.

In summary, the application of micro interactive videos in teaching has a significant effect on improving the learning effectiveness of primary school students' ancient poetry.

Part 4: The learners' satisfaction with the interactive micro-videos designed for learning the meaning of Chinese poetry

After 35 students in the experimental group used the micro-interactive video, I surveyed their satisfaction with using the video to learn the meaning of ancient Chinese poetry. The study yielded the following results:

1) Student Basic Information

Table 10: Basic information of 35 students

Items	Category	Number of persons	Percentage
Grader	Male	20	57.14
	Female	15	42.86
Total		35	100
Age	7 years old	6	17.14
	8 years old	19	54.29
	9 years old	10	28.57
Total		35	100

From the information in Table 10, it can be seen that a total of 35 second grade students participated in the questionnaire, with more male students than female students providing information, accounting for 57.14%. The majority of second grade students are 8 years old, as shown in the table below for more details.

2) This is a survey on the influence of micro interactive videos on Chinese ancient poetry among second grade elementary school students. As shown in Table 11

Table 11: Percentage of satisfaction of second grade primary school students towards the micro-interactive video of ancient Chinese poetry.

No.	Interactive Micro Satisfaction Assessment	Measure the students' satisfaction		
		n=35		
		Agree (Yes)	Neutral	Disagree (No)
1.	Using micro-interactive videos helps learn the meaning of ancient poetry.	100.00	0.00	0.00
2.	Using micro interactive video courses can increase interest in learning ancient poetry.	100.00	0.00	0.00
3.	I stay focused during the playback of the micro lesson video.	97.14	0.00	2.86
4..	Learning the meaning of Chinese poetry from micro interactive videos improves learning effectiveness.	97.14	0.00	2.86
5.	Learning an ancient poem is easier with micro-interactive videos.	94.29	2.86	2.86
6.	Learning through micro interactive videos makes me want to visit Lushan Waterfall	94.29	5.71	0.00
7.	After learning ancient poetry through interactive videos, I can imagine the scene while reading the poetry.	94.29	2.86	2.86

No.	Interactive Micro Satisfaction Assessment	Measure the students' satisfaction		
		n=35		
		Agree (Yes)	Neutral	Disagree (No)
8.	I enjoy learning ancient poetry through micro-interactive videos.	91.43	8.57	0.00
9.	Learning ancient poetry through interactive videos helps in understanding the thoughts and emotions expressed by the author.	85.71	8.57	5.71
10.	Learning through interactive videos is more interesting than watching regular micro lessons.	82.86	5.71	11.43
Total		93.06	3.43	2.86

Table 11 showed that the overall satisfaction of the 35 primary school students indicated a strong acceptance of the micro-interactive video. The majority of students, accounting for 93.06%, agreed that the video significantly enhanced their understanding of the meaning of ancient Chinese poetry. Based on the acceptance and impressions after using the interactive media, ranked from the highest to the lowest percentage as shown in Table 4.9, the results were as follows:

Rank 1: The statements 'Using micro-interactive videos helps learn the meaning of ancient poetry' and 'Using micro-interactive video courses can increase interest in learning ancient poetry' both received 100%.

Rank 2: The statements 'The learners stayed focused during the playback of the micro lesson video' and 'Learning the meaning of Chinese poetry from micro-interactive videos improved learning effectiveness' received 97.14%.

Rank 3: The statements 'Learning an ancient poem was easier with micro-interactive videos,' 'Learning through micro-interactive videos made me want to visit Lushan Waterfall,' and 'After learning ancient poetry through interactive videos, I could imagine the scene while reading the poetry' received 94.29%.

All other items received percentages above 80%, as detailed in Table 11

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Chapter 5

Conclusion, Discussion, and Suggestion

The research on "Micro Interactive Video to Learning the Meaning of Chinese Poetry for Primary School Students in China" has drawn the following conclusions and recommendations:

Conclusion

The researchers divided their conclusions into four parts:

Part 1: Results on the current situation and learning needs of primary school students in learning ancient Chinese poetry, as well as their views, attitudes, and preferences towards designing micro interactive videos in Chinese poetry education

The research results found that most second grade elementary school students find learning Chinese ancient poetry challenging, especially in understanding the meanings of these poems. The reason why students feel difficult is that the vocabulary used in ancient Chinese poetry is complex and challenging, making it difficult for them to imagine the imagination and emotions expressed by the poet. The language of ancient Chinese poetry is complex, difficult, and rich in content, which reduces the interest of Chinese poetry classrooms and poses challenges to traditional teaching methods, resulting in students lacking learning motivation. In addition, some students lack interest in learning ancient poetry and consider it irrelevant. This indicates that it is necessary to stimulate students' interest and awareness in supplementary teaching.

Regarding whether it is necessary for second grade students to learn the meaning of ancient poetry through micro interactive videos, the survey found that most students attach great importance to and are interested in micro interactive videos. They believe that micro interactive videos can effectively explain the meaning of poetry and make the picture clearer. The use of micro interactive video courses can enhance students' interest in learning ancient poetry. Students prefer to use animations (both static and dynamic) and short text in micro interactive videos to expand the meaning of poetry. They also like to use voiceover to explain the meaning of poetry in videos. In addition, they believe that learning the meaning of Chinese poetry from

interactive short videos will greatly improve their learning outcomes. The students expressed their willingness to actively participate in the study of ancient poetry, believing that it would be beneficial for their growth and learning. However, there are still some students who lack interest in learning ancient poetry and believe that it has nothing to do with them.

These findings emphasize the necessity of stimulating students' interest and awareness in learning, as well as the importance of integrating micro interactive videos into teaching practice. Experienced teachers have revealed the challenges that second grade students face when learning ancient Chinese poetry, emphasizing the necessity of adopting a comprehensive approach. This includes addressing challenges related to understanding meaning, comprehending complex content, and effectively presenting images. Teachers believe that these videos can effectively attract students' interest, help them intuitively understand the profound connotations of Chinese poetry, and enhance the overall learning experience. The integration of diverse content, subdivision of materials, interactive functions, and instant feedback are expected to improve the efficiency of ancient poetry teaching, making the learning process more lively, participatory, and effective. It is expected that promoting innovative teaching methods will improve the teaching effectiveness of Chinese ancient poetry for both teachers and students.

Part 2: Outcomes of the development of micro interactive video for learning the meaning of Chinese Poetry for primary school students in China

1. The development of micro-interactive videos for primary school students to learn ancient poems is divided into three stages: preliminary analysis, content design, video production, and release. All four stages have been evaluated for applicability and received improvement suggestions from mentors. After successful development, the media will be evaluated by three experts in terms of content, design, and interactive media.

2. The evaluation results show that the quality of micro-interactive videos for Chinese primary school students to learn ancient poems is high. Overall, the quality is good. The content quality is good. Specifically, "the micro-interactive video accurately conveys the meaning of the selected ancient poems" and "the video effectively integrates the natural and cultural backgrounds" scored the highest. The

second aspect is that the quality of interactivity is good, especially the video interface is intuitive, easy to browse and participate, and is rated as very good quality. The third aspect, design, is also rated as good quality, mainly in that the sound quality is clear and suitable for the target age group, the interactive elements enhance the students' learning experience, and the design takes into account both educational content and entertainment to allow learners to participate.

Part 3: Comparing the Learning Achievements of Chinese Primary School Students in Understanding the Meaning of Chinese Poetry.

Pre-test and post-test comparison of Chinese primary school students' learning outcomes in understanding the meaning of Chinese poetry.

Pre study testing and post study testing was conducted on 35 Chinese second grade primary school students. The test scores were analyzed using a dependent sample t-test, and it was found that there was a statistically significant difference in the accuracy of the pre - and post test scores. The post test scores were significantly higher than the pre test scores, indicating that the teaching intervention has a significant effect. After learning through micro interactive videos, students' test scores for the ancient poem "The Waterfall in Mount Lu Viewed from Afar" have significantly improved. Using this learning method can effectively enhance students' learning outcomes, and the application of micro interactive videos in teaching has a significant effect on improving the learning outcomes of elementary school students' ancient poetry.

Part 4: The learners' satisfaction with the interactive micro-videos designed for learning the meaning of Chinese poetry

After 35 students in the experimental group have used micro interactive videos, we investigated their satisfaction with learning the meaning of ancient Chinese poetry through videos.

Primary school students have a high overall satisfaction with micro interactive videos. The vast majority of students believe that micro interactive videos greatly enhance their understanding of the meanings of ancient Chinese poetry. According to the acceptance and impression after using interactive media, the top three in terms of percentage from high to low are:

1. Using micro interactive videos can help learn the meaning of ancient poetry, and using micro interactive video courses can increase interest in learning ancient poetry

2. Learners always maintain concentration while playing micro lesson videos, and learning ancient poetry definitions through micro interactive videos improves learning effectiveness

3. Learning ancient poetry through micro course videos is easier. Learning ancient poetry through micro course videos makes me more eager to go to the Lushan Waterfall. After learning ancient poetry through interactive videos, I can read poetry while imagining the scene at that time.

Discussion

Three points were proposed for the discussion of the research results, as follows:

1. Problem discovery and the need for micro-interactive videos to learn the meaning of ancient poems

The main factors affecting Chinese elementary school students' learning of Chinese poetry are the characteristics of ancient Chinese poetry. Second grade students generally find it difficult to understand the meaning of ancient poetry, especially in comprehending specific vocabulary. Chinese ancient poetry is challenging in imagining and understanding the emotions and thoughts expressed by the author. This is because the language of ancient Chinese poetry is complex and difficult to understand, and the content is too extensive. This discovery is consistent with the research results of Huang&Li (2020). Discussed how the differences in meaning and modern usage of words in ancient poetry create significant obstacles for students. In addition, Gu's (2022) research also indicates that the highly condensed and rich imagery of ancient poetry poses a great challenge to the understanding of lower grade students.

2. Results of micro-interactive video development

The factors that enhance Chinese primary school students' learning of Chinese poetry mainly include the following aspects:

2.1 Content Display:

Visual and auditory fusion: Combining animation and storyline to vividly showcase the content of poetry, while utilizing sound effects such as music, recitation, and sound effects to enhance emotional expression and atmosphere creation.

Introduction to History and Culture: While showcasing the content of poetry, incorporating an introduction to the history and cultural background of poetry helps the audience to have a more comprehensive understanding of the poetry.

2.2 Interactive Function:

Click and drag interaction: Design these features to increase audience engagement and exploration, making the learning process more proactive and enjoyable.

Interactive quizzes and mini games: embed these elements to test the audience's understanding of poetry content and provide immediate feedback, promoting the consolidation of learning outcomes.

2.3 Personalized Learning:

Customized learning path: Based on students' learning progress and interests, dynamically adjust the presentation order and difficulty of learning content to achieve personalized teaching.

Fragmentation of content: Breaking down poetry content into short fragments facilitates students' concentration, improves learning efficiency, and also facilitates personalized customization.

2.4 Multimedia Design:

Visual design: Using attractive visual elements and animation effects to enhance the viewing and appeal of the video.

Auxiliary voice: Using vivid voice commentary and music to assist the audience in understanding the meaning of poetry and enhance emotional resonance.

Short Text: Combining visual and auditory elements, further expanding the meaning and background knowledge of poetry through concise and concise textual explanations.

Following the above factors, the effectiveness of these elements has been confirmed through feedback from 35 second grade elementary school students. Research has shown that they can enhance the understanding and learning experience of Chinese ancient poetry among second grade elementary school students, making it

easier for them to master complex language and content. This viewpoint is consistent with Chen's (2022) research, which suggests that integrating text, animation, and audiovisual elements synergistically affects students' senses and fully unleashes their imagination; By utilizing its powerful interactive features, create activities that stimulate students' interest in learning. In addition, Guo (2019) also pointed out that the combination of visual and auditory teaching methods can effectively improve students' learning interest and comprehension ability.

3. Pre-test and post-test comparison of Chinese primary school students' learning outcomes in understanding the meaning of ancient poems

By comparing the pre-test and post-test, we can observe the progress of students in different learning stages. In the pre-test, students' comprehension ability was weak, mainly in the grasp of the literal meaning, cultural connotation and author's emotions of ancient poems. After targeted teaching intervention, especially through the auxiliary teaching of micro-interactive video multimedia tools, students' comprehension ability in the post-test is usually significantly improved. The effectiveness of this teaching intervention has also been confirmed in other studies.

This is consistent with the study of Zhang et al. (2019), which pointed out that the interactive learning environment can help students understand abstract poetry and cultural background more intuitively through multi-sensory stimulation, thereby improving learning effects.

At the same time, the study of Li and Wang (2020) also showed that on the basis of traditional teaching methods, the use of multimedia-assisted teaching can enhance students' interest in ancient poems and improve their enthusiasm and initiative in learning. Especially among lower grade students, the fun and intuitiveness of interactive videos have a positive impact on their learning. Through these technical means, students can better understand the deep meaning of ancient poems, which is consistent with the comparative data of pre-test and post-test.

Therefore, the comparison between the pre-test and the post-test can not only evaluate the students' progress in learning ancient poetry, but also verify the effectiveness of the interactive teaching method. This is also in line with the current trend of combining educational technology development with traditional teaching, and

reflects the research results of improving students' learning effects through diversified teaching methods.

4. Students' satisfaction with micro-interactive videos

The overall satisfaction of second grade elementary school students with micro interactive videos was evaluated by 35 second grade elementary school students, and the overall evaluation was satisfactory. This is mainly due to the carefully designed interactive functions and matching audio-visual presentation, which is consistent with Liu's (2018) research. The study pointed out that the aesthetic interface, simple operation, interactive form and timing design play a significant role in promoting students' learning and improving their attention. Rich media presentation methods and scenarios can effectively attract learners' interest and attention. The design of interactive exercises allows students to consolidate their learned knowledge in a timely manner, creating a good interactive environment for students.

Suggestion

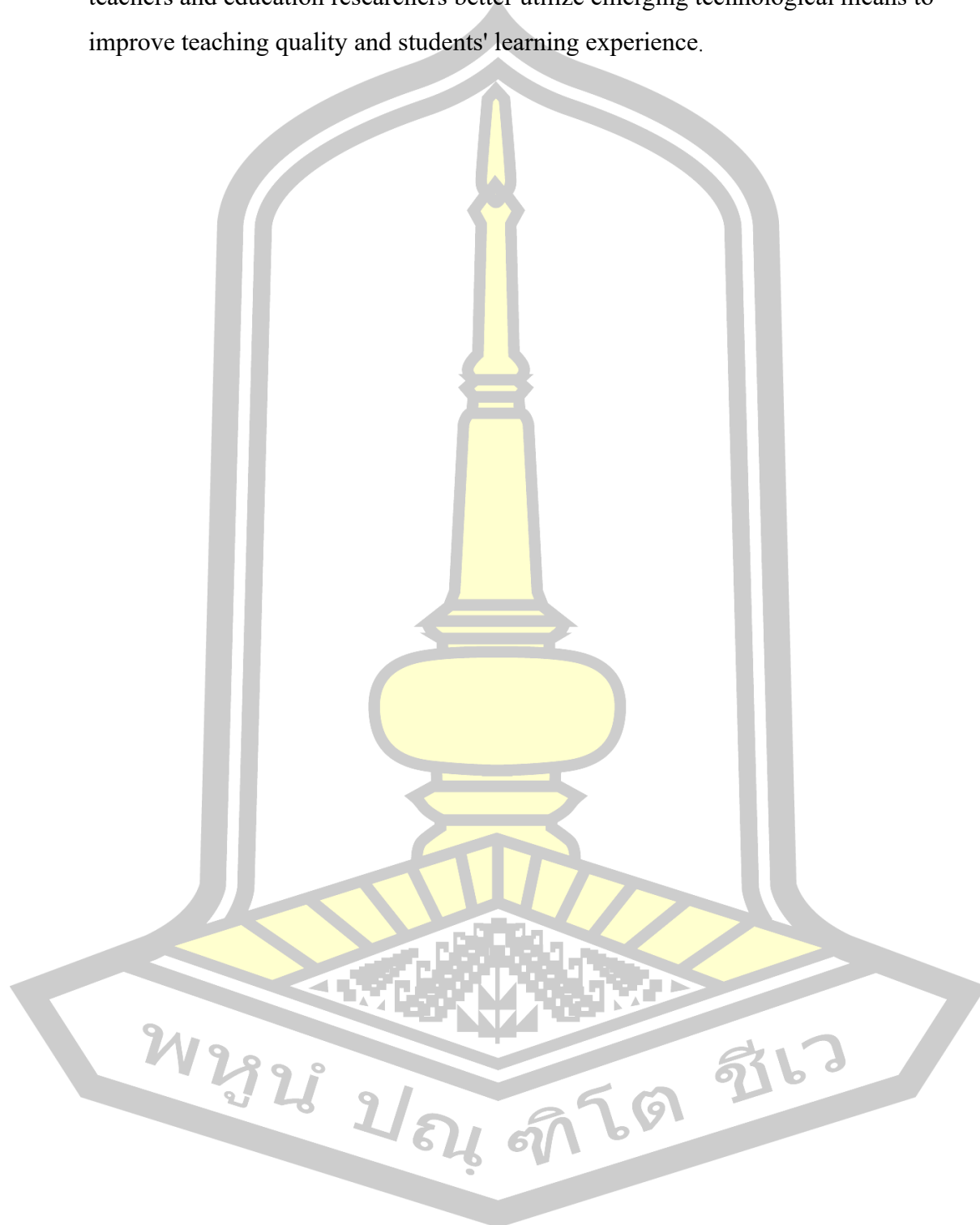
1. Research recommendations

This research project is an attempt to apply new media to the teaching of ancient Chinese poetry. In this process of practice and exploration, there are still many imperfections that need to be continuously learned, explored, and improved in the future. We hope that educators can fully recognize the challenges that primary school students face when learning ancient poetry, and create a lively and engaging learning environment through micro interactive videos, thereby igniting students' interest and enthusiasm for learning. At the same time, we also hope that teachers will actively explore the integration of micro interactive videos into the teaching of ancient Chinese poetry. Continuously exploring micro interactive video technology to enhance the overall quality of teaching Chinese ancient poetry.

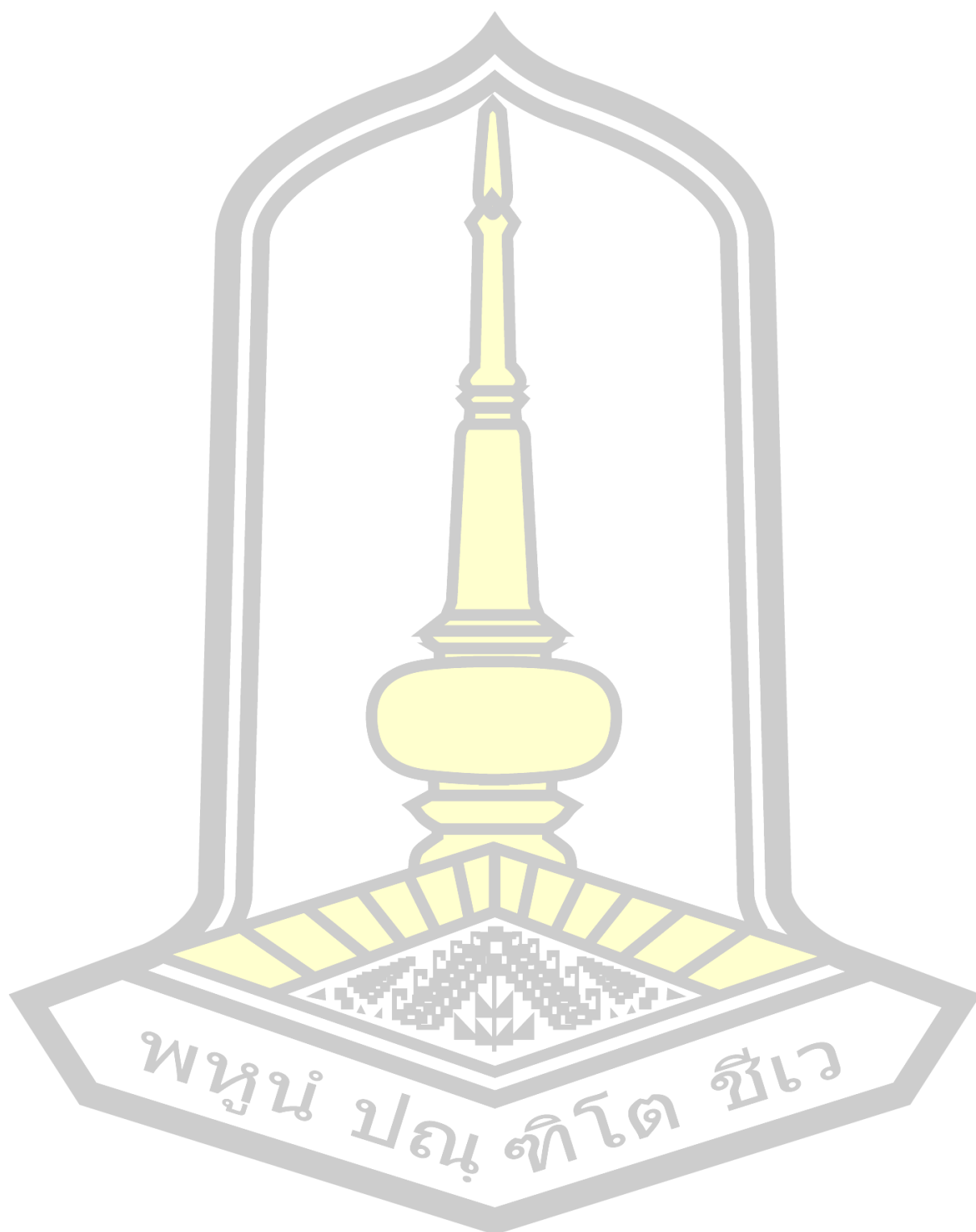
2. Suggestions for the next step of research

With the rapid development of information technology, it is recommended that future education researchers and teachers keep up with the pace of the times, constantly explore new technologies such as augmented reality (AR), virtual reality (VR), and artificial intelligence (AI), explore their applications in teaching ancient poetry in

primary schools, further enhance the interactivity and immersion of learning, and help teachers and education researchers better utilize emerging technological means to improve teaching quality and students' learning experience.



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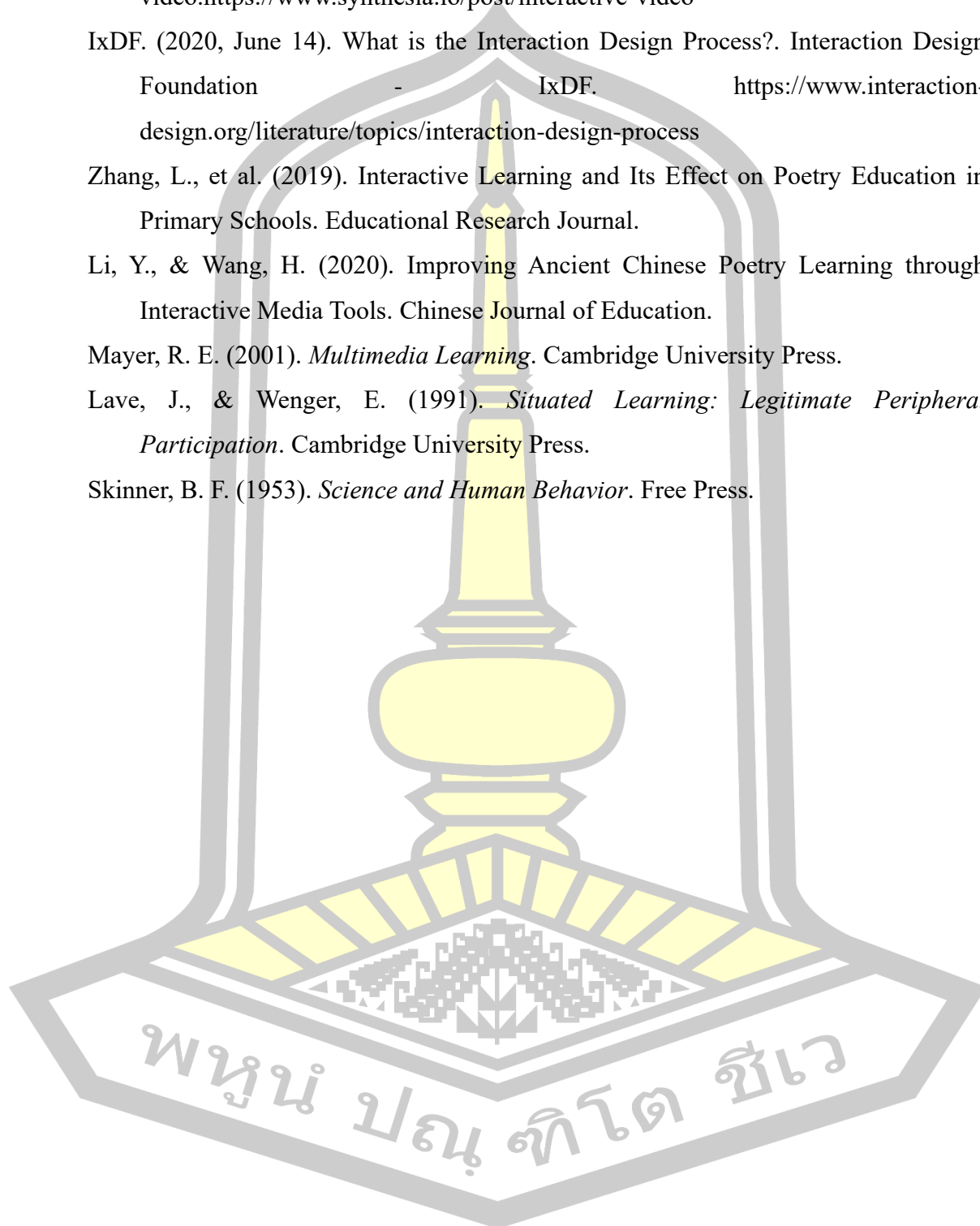
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