The Effects of Project-based Learning on Chinese Reading Achievement of Primary 6 Students

Jie Wang*
Sudaporn Pongpisanu**
Thongpan Boonkusol***

Abstract

This research was to study the effects of project-based learning on Chinese reading achievement of Primary 6 students. The objectives were 1) To study project-based learning that enhanced Chinese reading achievement of Primary 6 students, 2) To study the students reading interests in Chinese reading through project-based learning. The sample group used in this research was 30 students in Primary 6, Semester 1, Academic Year 2024, selected through the Cluster Random Sampling method, by using the classroom as the randomization unit. The tools used in the research consisted of 1) primary school project-based reading teaching materials, 2) primary school project-based reading ability tests, and 3) primary school project-based thinking tendency questionnaire test consisting of 15 questions.

The results of the research showed that 1) teaching activities in using project-based learning technique helped Primary 6 students to

* *Master of Education in Educational Curriculum and Learning Management College of Educational Innovation, Saint John's University.*
** *Advisor*
*** *Co-advisor*

have the significantly higher academic achievement than before learning at the statistically significant level of .05, 2) Students were at the highest level of thinking tendency through the project-based learning with the reading achievement ($\overline{X}$ = 4.58, SD = 0.31).

Keywords: Project-Based Learning, Reading Achievement, Reading Instruction, Reading Interest

Introduction

The Chinese Language Curriculum Standards for Compulsory Education (2012) point out that "Reading is a personalized behavior of students, and students should be influenced by emotions in active thinking and emotional activities, gain ideological enlightenment, and enjoy aesthetic pleasure". From the perspective of teaching content, it also clearly puts forward another requirement for Chinese language courses to attach importance to reading teaching. Wen Rumin (2019), the chief editor of Chinese language textbooks, proposed that in reading teaching, the focus is to cultivate students' interest and habits in reading. In September 2023, Shanghai launched the comprehensive promotion of project-based learning in compulsory education schools.

The manifestation of student consciousness by teachers is not prominent in the teaching process. Student consciousness requires teachers to be student-centered and respect students' learning rights in the teaching process. Tao Xingzhi (2014), succinctly pointed out in his article "Teaching in One": "The responsibility of a teacher is not to teach, but to teach students how to learn." American humanistic psychologist Rogers (2002), also pointed out bluntly: "... knowledge that can affect a person's behavior can only be his own discovery and transformed into existing knowledge." It can be seen that the ultimate goal of teachers' teaching is not to teach, but to enable students to learn self-directed learning. However, in the current classroom, students' time and rights for independent thinking, judgment, and learning have not been fully reflected. Teachers always crave to continuously impart all the knowledge involved in the text to students, so in the classroom,

there is usually only the sound of teachers lecturing incessantly, and there are almost no "signs of life" of students.

Students have slow reading speed, insufficient reading ability, and may find it difficult to read questions, lacking a certain level of reading ability; Students' interest in reading is not high. They prefer playing games and watching TV, and are unwilling to spend time reading; Students' reading comprehension ability is insufficient, and sometimes there may be inaccurate understanding of text. According to the answer situation of the Chinese language test paper for primary school graduation survey in 2023, the reading questions were scored a total of 39 points, and the score rate of the students who participated in the questionnaire survey was only 57.2%. The reading was divided into two parts, one of which was non continuous text reading: students were asked to find the corresponding content in the text, understand the naming method of "Heavenly Palace", analyze keywords, and talk about their feelings. Students cannot grasp the key points and the direction of answering questions; Students can understand the surface meaning of the second article, but they cannot comprehend the deeper meaning. Additionally, 72.3% of students did not answer all the questions.

Ministry of Education of the People's Republic of China (2012), standards clearly state that "Chinese language courses should advocate for autonomous, cooperative, and exploratory learning methods." Chinese language classroom is a two-way interactive classroom between teachers and students. To establish an open and dynamic classroom, efforts must be made to reflect the practicality and comprehensiveness of Chinese language, allowing students to form personalized understanding through independent cooperation and exploration. Applying project-based learning to primary school Chinese reading teaching can optimize traditional reading teaching methods and promote the diversified development of students' reading styles and learning outcomes. It is specifically reflected in two aspects, namely: the transformation of teacher-student relationships can change teachers' teaching methods and provide a foundation for diverse reading methods; The transformation of students' learning methods can awaken their autonomy

and provide guarantees for diversified reading learning outcomes. The application of project-based learning in primary school Chinese reading teaching has transformed the traditional teacher-student relationship, which has also changed the teaching methods of teachers and provided a foundation for the diversification of students' reading styles. In traditional Chinese reading classrooms, teachers mostly use the lecture method for teaching. The teacher's voice is always ringing in the classroom, with the teacher lecturing incessantly and the students silently listening. This traditional classroom teaching method did not place teachers and students in an equal position. The application of project-based learning in primary school Chinese reading teaching has made the teacher-student relationship more equal, and teachers have achieved a transformation from lecturers to guides. In project-based learning, teachers need to create real learning situations for students, allowing them to practice independently or collaborate in groups based on problems, solve problems in the process of exploration, and gain knowledge and understanding. The implementation process fully respects students' right to self-directed learning and returns learning time and opportunities to them. The equality of teacher-student relationships is also reflected in the multidimensional and multi form evaluation of students by teachers. Teachers do not judge students' learning based on a single learning outcome, but instead use multidimensional and multi form evaluations, such as oral or scale evaluations, to comprehensively evaluate participation enthusiasm, attitude, or completion status. Every exploration has no unique outcome, and every student's performance and learning outcomes will be respected. The transformation of teacher-student relationships and evaluation methods can encourage students to form personalized and diverse understandings in reading, promoting students' diversified reading. Xia Xuemei (2018), believes that the characteristic of project-based learning is that it is a transformation of learning and teaching, which can indeed change the real behavior of learning and teaching, and break through the dilemma of theoretical topics. As an organizational form of classroom teaching, project-based learning forms diverse curriculum themes that are beneficial and rich to traditional curriculum structures, providing new directions for school curriculum reform. In terms of classroom teaching,

project-based learning often adopts the method of unit design, which improves teaching efficiency and value while keeping the class hours unchanged. As Professor Zhong Qiquan (2017), said, units are not fragmented as knowledge points in teaching content, but are organized and composed organically and modularly. Therefore, the design of text units is not simply about knowledge transmission and skill training, but about teachers scientifically designing learning and exploration activities in the context of subject literacy. The design of project-based learning units can highlight the exploratory and higher-order thinking of learning activities.

Based on the above analysis, the use of project-based learning in teaching is of great value.

It further improves the current situation of Chinese reading teaching, creates a good learning atmosphere, enhances the effectiveness of Chinese reading achievement, injects fresh blood into traditional classrooms, and makes classroom teaching full of vitality and energy.

Research Objectives

The aims of this research are a follow:

1. To study project-based learning could enhance Chinese reading achievement of Primary 6.

2. To study the students reading interests with Chinese reading achievement through project-based learning.

Research Hypothesis

1. If the learning design of project-based learning can help students better master reading skills, their reading achievement will be greatly improved and they can get higher scores in exams.

2. The implementation of project-based reading reading achievement in primary school Chinese can enhance students' interest in reading.

Conceptual Framework

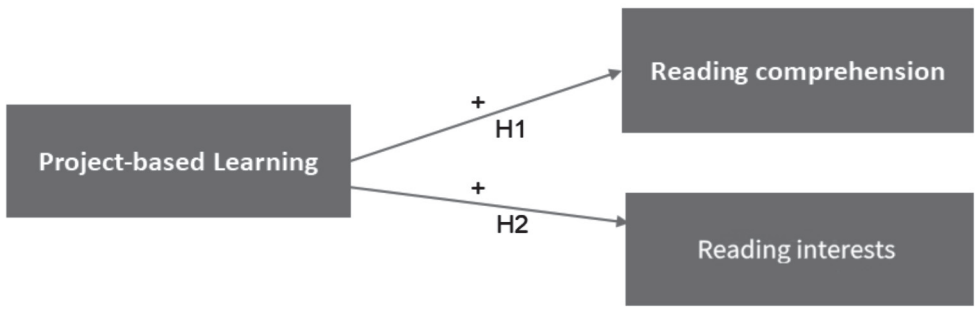
The researchers reviewed the theories and concepts related to project-based learning, reading comprehension, learning outcomes, related research, and other studies from a given perspective and research.

The relevant variables of this study are as follows:

Independent variable: Project based learning

Dependent variable: Reading comprehension and interests.

Table 1: Research conceptual Framework



Building and evaluating the quality of research tools

1. Combining project-based learning with reading instruction to build and find high-quality lesson plans involves the following steps:

1.1 According to the "Chinese Curriculum Standards for Compulsory Education" (2011), research on the objectives and requirements of reading teaching.

1.2 The concepts and theories related to project-based learning and reading instruction, as well as related research.

1.3 Determine the content to be used in this research, Unit 3 of Grade 6 Chinese Language textbook. This unit consists of poetry, explanatory texts, and essays.

1.4 Define the structural framework for organizational learning. According to the "Chinese Language Curriculum Standards for Compulsory Education Stage (2011), 12 thematic contents have been developed for sixth grade students to use project-based learning.

1.5 Continue to use project-based learning for reading exercises, with 4 subjects and 5 sessions per week for 3 weeks.

1.6 Bring the learning management plan Project-based Learning on Chinese Reading Achievement created by the researcher Present to the advisor to check the initial accuracy and bring the learning management plan to improve according to the advisor's suggestions.

1.7 Bring the learning management plan that was created. Presented to 3 experts to find the IOC (Index of Item Objective Congruence) which considers the criteria for evaluating consistency from 0.50 - 1.00 and up (Luan Saiyot and Angkana Saiyot, 2000), and obtained the average of the IOC values of the 3 experts equal to 1.00.

1.8 Use a cooperative learning plan using the project-based learning which was revised according to the suggestions of experts

2. Development and determination of reading test quality

Create a test question bank to measure reading proficiency, with 50 questions in each group and 3 options for each question. Choose 30 questions that meet the actual usage standards. The steps are as follows:

2.1 Study the requirements of the "Chinese Language Curriculum Standards for Compulsory Education" (2011) regarding reading teaching, determine the scope of testing and the content of evaluation.

2.2 According to the "Chinese Language Curriculum Standards for Compulsory Education" released by the Ministry of Education, create a test analysis table, and divide Jiang's goals into four areas: Recognition Ability, Comprehension Ability, Evaluation and Analysis Ability, Expression and Application Ability.

2.3 Study other literature and research related to reading tests.

2.4 Create a test question bank with 50 questions, each with 3 options.

2.5 Show the reading test questions to three experts and ask them to find the IOC (Index of Item Objective Congruence) consistency index in the evaluation table and obtained the average of the IOC values of all 3 experts equal to 1.00

2.6 Measure students' reading test scores based on expert advice.

2.7 Analyze students' test scores before and after the experiment.

3. Create interest measurement standards

Conduct an interest survey using project-based learning. Each interest survey consists of 15 questions, and the steps are as follows:

3.1 Create an interest survey form, with designed questions covering research content and objectives.

3.2 Clearly define the detailed content of the interest evaluation form, including all questions from students.

3.3 The developed interest survey was designed in accordance with standard satisfaction assessment principles, consisting of 15 items. A 5-point Likert scale, originally introduced by Rensis Likert (1932).

3.4 Present the results of the satisfaction survey and its consistency with IOC goals to three experts, and use Cronbach's Alpha coefficient method to calculate the reliability value of the satisfaction survey.

3.5 Calculate the IOC between 0.5 - 1.00 based on the scores of 3 experts, with the following scoring then use the scores obtained by experts to calculate the IOC value. If it meets 0.7 or above, it is considered acceptable and can be used to collect data. The consistency index of all is equal 1.00.

3.6 Adopting a complete satisfaction measurement standard, modifying it based on expert recommendations, and then using it to evaluate the satisfaction of the student sample.

Result:

Table 2: Descriptive results and differences comparison of pre-test and post-test of project-based reading skills (M ± SD)

Indicator	Sample Size	Total Score	$\overline{X}$	SD	t	Sig
Pre-test	30	30	25.70	3.22	-10.37	0.000
Post-test	30	30	29.13	0.99		

p>0.01

In order to verify the reliability of the experimental results, this study used the t-test method in parametric testing to examine the average difference scores of high-level and low-level participants in the pre-test and post-test of project-based learning. That is, it compared and analyzed the improvement of project-based learning scores to verify the effect of experimental treatment.

Referring to the division ratio of high (27%), medium (46%), and low (27%) in general measurement, this study divided the scores into a high-score (27%) group and a low-score (27%) group based on the pre-test scores of project-based learning, in order to further compare the value-added of project-based learning scores. Since the sample size of both the high-level and low-level groups were less than 30 (n = 8), this study used the Mann-Whitney U-test method in non-parametric testing to examine the value-added of project-based learning scores in both groups, so as to further explore the internal effects and reliability of the experimental data.

Through non-parametric testing, the results indicated that there was a significant difference in the value-added of project-based learning scores between the high-level and low-level groups ($Z = 22.00$, $p < 0.05$). Specifically, the value-added of project-based learning scores in the high-level group (pre-test: 28.63 ± 0.83, post-test: 29.75 ± 0.46) was significantly lower than that in the low-level group (pre-test: 20.25 ± 1.28, post-test: 28.13 ± 1.25).

After the experiment, the subjects showed P<0.05 in four aspects: recognition and reading ability, comprehension ability, evaluation and analysis, and expression and application, which is statistically significant, proving that there is a significant improvement in students' reading ability after intervention; The total score was P<0.001, which was statistically significant, indicating that the reading achievement improved significantly after the intervention.

Table 3: Questionnaire

NO.	Content	$\overline{X}$	SD	Result
1	The content of reading class can arouse my curiosity.	4.43	0.86	Agree
2	Reading class activities can attract my attention.	4.03	0.93	Agree
3	The learning style of reading class is very interesting.	4.27	0.83	Agree
4	I now like reading class.	4.37	0.76	Agree
5	I think reading is very necessary.	4.20	0.92	Agree
6	I like reading class.	4.57	0.68	Strongly Agree
7	The learning content of reading class is very interesting.	4.43	0.89	Agree
8	The teacher's questions in reading class are interesting and meaningful.	4.57	0.77	Strongly Agree
9	For the questions in the reading class, I am willing to explore, think, learn and answer.	4.7	0.70	Strongly Agree
10	For the questions in the reading class, I am willing to try to see more materials to solve.	4.8	0.55	Strongly Agree
11	Reading knowledge mastered in reading class is very important to me.	4.73	0.58	Strongly Agree
12	Various skills mastered in reading class are very important to me.	4.6	0.62	Strongly Agree
13	All kinds of knowledge acquired in reading class are very useful to my study life.	4.67	0.66	Strongly Agree
14	Various skills mastered in reading class are very useful for my study life.	4.63	0.56	Strongly Agree
15	Project-based learning can continue to be used for reading instruction.	4.73	0.58	Strongly Agree
	Summary	4.52	0.31	Strongly Agree

From the table, it was found that the study of students' interest in learning Chinese for 6th grade primary school students who received project-based learning management, totaling 30 students, was at the highest level overall, with an overall mean of ($\overline{X}$ = 4.52, SD = 0.31). When considering each item, it was found that the items with the highest level of satisfaction were 3 in order as follows: The first is for the questions in the reading class, I am willing to try to see more materials to solve. ($\overline{X}$ = 4.8, SD = 0.55) the second are .Project-based learning can continue to be used for reading instruction. ($\overline{X}$ = 4.73, SD = 0.58) and Reading knowledge mastered in reading class is very important to me. ($\overline{X}$ = 4.73, SD = 0.58)

Summary and Discussion

Summary Discussion

This study investigated the effectiveness of project-based learning in improving Chinese reading achievement and reading interest among Primary 6 students. The research was conducted through pre-test and post-test assessments, as well as student surveys on reading interest.

1. The results indicated a significant improvement in students' comprehension ability, evaluation and analysis skills, and expression and application skills ($p < 0.05$). The total reading achievement score also showed a statistically significant increase ($p < 0.001$), confirming the effectiveness of project-based learning.

The zone of proximal development (ZPD) theory proposed by Vygotsky (1978) suggests that students learn best when they engage in activities slightly beyond their current capabilities with teacher or peer support. The project-based learning approach in this study aligns with this theory by encouraging students to collaboratively explore reading materials, analyze text structures, and express their understanding through projects. These findings are consistent with Marsh and Martin (2011), who found that structured peer collaboration enhances comprehension and retention.

However, the study also found that the improvement in word recognition and fluency was not as significant. This may be due to project-based learning focusing more on critical thinking and analysis rather than basic literacy skills. Similar findings were reported by Hattie (2007), who highlighted that direct instruction is often more effective than inquiry-based learning for basic skill acquisition.

2. Survey results showed that students' engagement, motivation, and willingness to explore reading materials significantly improved after the intervention ($p < 0.005$). The average reading interest score was 4.52 (out of 5), indicating a high level of agreement among students that project-based learning enhanced their reading experience.

These results are supported by Deci and Ryan's Self-Determination Theory (1985), which emphasizes the role of autonomy and intrinsic motivation in learning. By allowing students to engage in self-directed learning and project collaboration, project-based learning fosters a sense of ownership over learning, which contributes to increased motivation. This aligns with Chickering and Gamson's (1987), seven principles of good practice, which advocate for active learning and collaboration.

However, some students still expressed difficulty in adapting to the self-directed nature of project-based learning, particularly those with lower reading proficiency. Similar findings were reported by Piaget (1952), who noted that younger learners often require more structured guidance in early cognitive development stages.

Research Suggestions

Based on the findings, the following recommendations are proposed:

1. Select Appropriate Learning Projects Based on Students' Needs

Teachers should tailor project-based reading activities to match students' reading abilities. According to Anderson, L. W., & Krathwohl (2001), learning activities should progress from basic knowledge recall to higher-order thinking skills. This ensures

that students with lower proficiency can first build foundational reading skills before engaging in complex analysis.

2. Pay Attention to Student Feedback and Differentiated Instruction

The study found that high-achieving students often took leadership roles, while lower-achieving students benefited more from structured group collaboration. Future implementations should consider rotating group roles so that all students experience different aspects of collaborative learning, in line with Vygotsky's ZPD model.

3. Provide Long-Term Training for Group Leaders

Since group leaders play a crucial role in facilitating discussions and organizing tasks, teachers should provide structured training on leadership and group management skills. This supports students in developing responsibility and communication skills, which are critical for effective teamwork.

4. Foster a Lifelong Reading Habit Through Project-based Learning

To sustain students' interest in reading, schools should integrate project-based learning into broader cross-disciplinary learning experiences. Hattie and Timperley (2007), emphasized the importance of continuous feedback and adaptive learning environments. Schools should provide digital resources, discussion forums, and extracurricular reading projects to maintain student engagement beyond the classroom.

Limitations and Future Research

This study had the following limitations:

1. Sample size: The study was conducted in a single private primary school, which may limit the generalizability of the findings. Future studies should expand the sample to public schools and diverse learning contexts.

2. Short study duration: The intervention lasted for one semester. A longitudinal study could examine the long-term impact of project-based learning on reading skills.

3. Measurement tools: While the study used validated questionnaires, future research could incorporate qualitative methods such as interviews or classroom observations to gain deeper insights into student learning experiences.

Reference

Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives.* New York: Addison Wesley Longman.

Chickering A W, Gamson Z F. (1987). *Seven principles for good practice in undergraduate education[J].* AAHE bulletin.

Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. New York, NY: Plenum.

Hattie J, Timperley H. (2007). The power of feedback. Review of educational research.

Likert, Rensis (1932). "A Technique for the Measurement of Attitudes". *Archives of Psychology*, *140*: 1–55.

Luan S.& Angkana S. (2000). *Techniques for measuring learning.* Printed no.2. Bangkok: Suweeriyasan.

Marsh H W, Martin A J. (2011). Academic self-concept and academic achievement: Relations and causal ordering. *British journal of educational psychology, 81*(1): 59-77.

Ministry of Education of the People's Republic of China. (2011). *Chinese Language Curriculum Standards for Compulsory Education* (2011 Edition) [S]. Beijing: Beijing Normal University Press.

Ministry of Education of the People's Republic of China. (2012). *Chinese Language Curriculum Standards for Compulsory Education.* Beijing: Beijing Normal University Press.

Piaget J, Cook M. (1952). *The origins of intelligence in children[M].* New York: International Universities Press.

Rodgers, C. R. (2002). Seeing student learning: Teacher change and the role of reflection. *Harvard Educational Review, 72*(2), 230-253.

Tao Xingzhi. (2014). *Chinese Language Education Theory.* Beijing: Chinese Language Press.

Vygotsky L S. (1978). *Mind in society: The development of higher psychological processes.* Harvard University Press.

Wen Rumin. (2019). *language class record* (Chinese Edition). Zhejiang: Zhejiang People's Publishing House.

Xia Xuemei. (2018). *Project based Learning Design: International and Local Practices from the Perspective of Learning Literacy.* Beijing: Education Science Press.

Zhong Qiquan. (2017). *Instructional Design.* Shanghai: East China Normal University Press.