



Research on the Construction of a Cultural Empathy Teaching Model Based on PBL-CL Integration in the Chinese Culture Learning of Thai Junior High School Students

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Abstract: This study explored the meanings of project-based learning (PBL) and cooperative learning (CL). By combining the PBL teaching model and the CL teaching model, a five-stage Chinese cultural empathy teaching model of "initiation - organization - exploration - presentation - evaluation" was formed. A 20-week teaching content based on the development logic of respecting Chinese culture was designed, and students from classes 5 and 6 of the second grade of X Middle School in a certain province of Thailand were selected as the experimental subjects. The experimental class adopted the integrated teaching mode of PBL-CL, while the control class used the conventional Chinese cultural empathy teaching method. Questionnaire surveys and pre- and post-academic performance comparisons were conducted on the learning effects of the experimental class and the control class in multiple dimensions. The experimental results showed that the average scores of the experimental class in terms of problem awareness and solving ability, learning interest and attitude, and cooperative awareness and cooperative ability were significantly higher than those of the control class. In the final test, the average final score of the experimental class reached above 75 points, significantly better than that of the control class. Independent sample t-test showed that the difference was statistically significant. 80% of the students agreed that group cooperation had a positive effect on the problem-solving ability of Chinese cultural empathy. The PBL-CL Chinese cultural empathy teaching model based on this provides an operational practical path for Chinese culture teaching for Thai junior high school students.

Keywords: PBL-CL; Chinese cultural theme development; teaching effect; Thai junior high school students

1. Introduction

Driven by the global trend of globalization, Thailand, as a friendly neighbor of China, leveraging its geographical advantages and historical ties, has become one of the countries in Southeast Asia with the largest scale and fastest development of Chinese language learning, and also the first country in the international community to incorporate Chinese into the national education system [1-4]. The phenomenon of "Chinese language learning" in Thailand is remarkable. From school education to social training, from ordinary people to the elite, the enthusiasm for learning Chinese culture continues to rise [5-6].

The Chinese language courses in Thai secondary schools often face two major tasks: one is to enhance students' Chinese proficiency, enabling them to have basic communication and reading comprehension skills; the other is to help students understand the connotation and practical methods of Chinese



traditional culture, and cultivate cross-cultural understanding and respect [7-9]. To achieve the organic unity of the two, schools regard Chinese traditional culture as an important situational resource and learning carrier, integrating it into the training of listening, speaking, reading, and writing in all four dimensions [10-11]. However, in the current Chinese language learning of Thai junior high school students, there are still areas that need improvement in terms of the practical orientation of Chinese culture, the lack of modernity in content, and the lack of interest. In this context, cultural empathy teaching has become an important reform path to enhance the effectiveness of Chinese language learning among Thai junior high school students [12-14]. Cultural empathy teaching is a teaching method that unfolds through interaction between teachers and students and among students, featuring emotional resonance and immersive learning experience. By constructing a cultural empathy teaching model of Chinese culture, it helps Thai junior high school students better understand Chinese culture and thereby improve their learning outcomes [15-18].

This paper integrates the task-driven framework of PBL (Project-Based Learning) and the group collaboration mechanism of CL (Cooperative Learning) to form a five-stage cyclic and progressive Chinese cultural empathy teaching process: "problem-driven - team formation - collaborative solution - outcome sharing - evaluation stage". Corresponding driving project tasks and group collaboration activities are designed around the main six Chinese culture theme modules, with respect to cultural differences and the development logic of cultural themes as the specific value orientation. Taking two classes of the second grade of a certain secondary school in a province of Thailand as the research objects, the experimental class adopted the PBL-CL integrated teaching mode designed in this paper, while the control class adopted the conventional teaching mode. A 20-week teaching experiment was conducted, verifying the effectiveness of this teaching mode in improving students' learning abilities and academic performance in all dimensions.

2. The PBL-CL-based Chinese Culture Empathy Teaching Model

2.1. Elements of the Chinese Culture Empathy Teaching Model

PBL refers to project-based learning, which is a learning method where students construct knowledge by exploring, designing, collaborating and problem-solving around a real and challenging project task [19]. CL refers to the cooperative learning model, where students work in groups and complete common learning goals through division of labor and cooperation [20]. This article integrates the PBL teaching model and the CL teaching model.

1) Cooperative Goals

During the collaborative process of a team-based nature, the positive influence among people is generated due to the common interests they share. Therefore, clear cooperative goals have become the driving force to promote this relationship to be more positive. The goals of cooperative learning have two meanings: learning goals and interpersonal communication ability goals. The formulation of these two levels of goals requires both the guidance and assistance of the teacher and the joint discussion and formulation by each group member. The achievement of the goals requires the joint efforts of each member of the learning group to achieve academic success and improvement in abilities, achieving a united effort and sharing the same fate effect.

2) Problem Design

In the PBL-CL integrated teaching model, each stage of classroom teaching is inseparable from the problem. Therefore, the problem is the core and mainstay of the PBL-CL integrated teaching model. The rationality of problem design will have a positive or negative impact on the smooth development of students' cooperative activities. Therefore, when setting problems, teachers need to consider two aspects: on the one hand, when creating the problem situation, the chosen situation should start from the students' existing cognition and ability, and be linked to their actual life, so that students will be more actively engaged in learning and exploration; on the other hand, the source and selection of the problem should be considered. In terms of the source, it includes the questions raised by students after perceiving the problem situation, the questions pre-determined by the teacher and jointly determined by teachers and students, and the problems formed during the teaching process. In terms of selection, attention should be paid to the systematicness and directionality of the problems, the difficulty and acceptability, the hierarchy and logic.

3) Training of Cooperative Skills

The PBL-CL integrated teaching model is conducted in the form of a cooperative group organization. Therefore, the communication in language, body and emotion among group members is the prerequisite for the completion of cooperative activities. This interaction requires each group member to have certain cooperative foundation to enable the cooperative process to proceed in the direction of the goal.

Cooperative skills mainly include the attitude of mutual respect and active participation in activities by each member, and certain organizational and communication abilities. However, most students currently have insufficient mastery of cooperative skills, which requires teachers to conduct promoting training of students' team awareness and cooperative skills after forming the cooperative group. The cultivation of this aspect mainly includes four steps: guiding students to understand various cooperative skills and their meanings, instructing students to train cooperative skills in relevant situations, specifically solving the common problems generated by students, and encouraging students to apply cooperative skills in class.

4) Presentation of Results

In the implementation of the PBL-CL integrated teaching model, after the students have conducted cooperative discussions, the presenters of each group present the common results or conclusions of the group. The forms of presentation mainly include oral reports, presenting learning report sheets, making molds, and using slides. In this model, students can present their own strengths and weaknesses in abilities and skills through competition among groups; at the same time, other students who did not participate in the problem-solving can expand the breadth and depth of their thinking by raising questions and receiving feedback, effectively promoting the teaching process. Teachers should supplement the students' presentations and guide the presenters to make summary expressions of their main ideas, thereby cultivating students' communication and communication skills and promoting their deeper and broader understanding of the concepts covered.

5) Summary and Evaluation

Evaluation can enable students to reflect on their own shortcomings and learn more actively. The evaluation of the PBL-CL integrated teaching model places greater emphasis on students' comprehensive performance. Therefore, in a "micro-society" such as a cooperative group, we need to break away from the single and unobjective evaluation concept and assess students using a more comprehensive and multi-faceted evaluation system. This evaluation is reflected in three aspects: Firstly, the evaluation subjects are diversified. In the PBL-CL integrated teaching model, the evaluation subjects include teachers, students themselves, and learning peers. Secondly, the evaluation content is multi-dimensional, including evaluations of students' academic goals and skills, as well as attention to aspects such as group interaction, resource sharing, and the quality of group outcomes. Finally, the evaluation methods are diverse. In terms of methods, various evaluation methods should be combined to form a comprehensive evaluation system, such as oral evaluations, test questions, cooperation record sheets, self-assessment and mutual assessment sheets, etc. The summary is to guide students to construct knowledge systematically. The results obtained by students in the cooperative learning process may have a certain distance from the set goals. To better achieve the learning goals, teachers need to guide students to extract key content, establish connections between knowledge, and form a complete system.

This study integrates the five teaching elements of the PBL-CL integrated teaching model and, based on the practical characteristics of the Chinese culture empathy teaching practice for Thailand, designs the overall model. Finally, it obtains the Chinese culture empathy teaching model for Thailand based on the PBL-CL teaching method. This model emphasizes problem orientation, starting from problems, and students acquire knowledge and apply it through solving real problems in real-life situations. The Chinese culture empathy teaching model based on PBL-CL is shown in Figure 1.

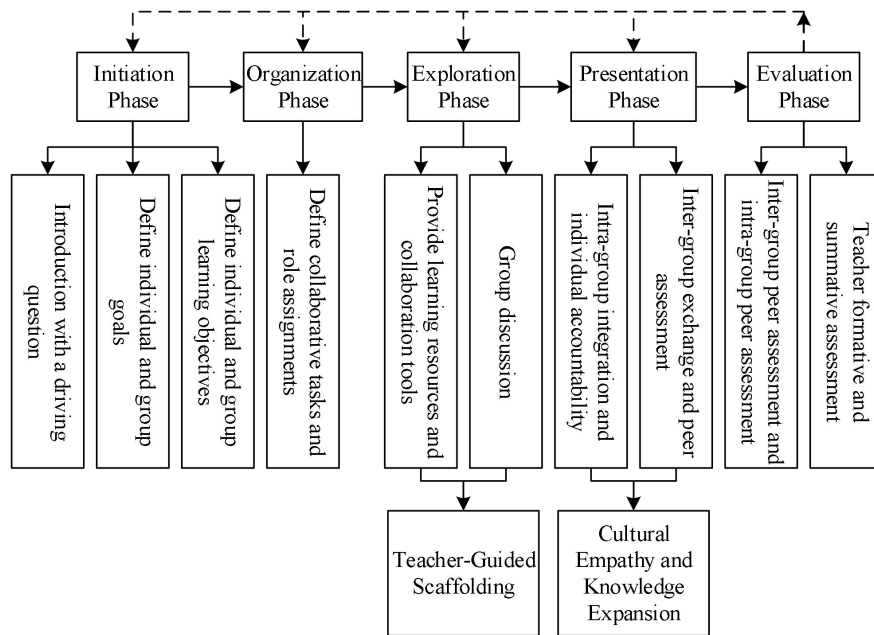


Figure 1. Based on PBL-CL's Chinese culture and mutual relationship teaching model

2.2. Content Validity Test of the Chinese Culture Empathy Teaching Model

In order to test the content validity of the teaching model for the foreign Chinese language culture course based on the PBL-CL teaching method, a content validity detection scale for this model was designed. In the content validity detection scale, "1", "0", and "-1" represent "agree", "uncertain", and "disagree" respectively. Five experts in the field were invited to test and score it. The results showed that the item target consistency index (IOC) of each element in the scale was greater than 0.5. This indicates that the model has good content validity and can be used to design and conduct teaching experiments for the Chinese culture empathy course for junior high school students in Thailand based on this model.

2.3. Curriculum Content of Chinese Culture Empathy Teaching Based on PBL-CL

In terms of the arrangement of teaching content, this study places great emphasis on the development logic of the Chinese culture theme - from tradition to modernity, from concrete to abstract, presenting the continuity and changes of culture over time, and helping Thai junior high school students establish a dynamic and comprehensive understanding of Chinese culture. Each module is centered around a driving task.

This study conducted a 20-week Chinese culture empathy teaching experiment for Thai junior high school students. This teaching experiment did not rely on fixed textbooks. The content of the teaching experiment was formulated by the International College of A Vocational and Technical College based on the specific content of Chinese culture and the characteristics of cultural empathy. According to the progress of the teaching experiment, the researchers arranged the teaching projects and teaching time as follows.

The first module is "Colorful China: From Festivals to Daily Life" (Weeks 1-3), centered around planning a comparison exhibition of Chinese and Thai festival cultures as a driving task, focusing on guiding students to understand the family concepts and natural philosophy of the Chinese people through festival customs, and establishing the starting point of cultural empathy through comparison.

The second module is "Taste of China" (Weeks 4-6), with the project task of creating a guide to Chinese cuisine from the perspective of Thai people. Through the entry point of dietary culture, which is close to life, it guides students to understand the differences and similarities between regional cultures and lifestyles from the dimensions of ingredient selection, cooking methods, and table benefits.

The third module is "The Country of Clothing: Chinese Clothing Culture" (Weeks 7-9), with the project task of designing a fusion show of Chinese and Thai clothing. In the process of exploring the evolution of Chinese clothing over time and the characteristics of ethnic clothing, students perceive the historical memories and aesthetic connotations carried by clothing culture symbols.

The fourth module is titled "Brush and Ink: Chinese Painting and Calligraphy Art" (Weeks 10-12), with the class organizing a Chinese painting and calligraphy experience workshop as the driving task. It

emphasizes hands-on practice and personal reflection, allowing students to experience the spirit of free expression and blank space in Eastern aesthetics through the manipulation of brushes, ink, paper, and inksticks.

The fifth module is titled "National and Family Sentiment: Chinese Values" (Weeks 13-15). The project task is to stage short plays depicting family stories from China and Thailand. Through the universal theme of family narratives, this module aims to guide students to deeply explore the similarities and differences in values between China and Thailand regarding filial piety, expression of family affection, and intergenerational relationships.

The sixth module is titled "Modern China: Technology and Life" (Weeks 16-18), and the project task is to complete a research report on my perception of modern China. The focus is on the true picture of contemporary Chinese social life, aiming to help students break through cultural stereotypes and build a multi-dimensional and dynamic understanding of Chinese culture.

The seventh and eighth modules are actually the comprehensive consolidation stage (Weeks 19-20). There is no new theme. Each group selects any one of the topics from the first six modules to conduct in-depth exploration, complete the final results and present them to the entire school for a cultural display. This serves as the summary presentation of the entire teaching experiment, comprehensively testing the overall improvement of students' cultural empathy ability.

3. Evaluation of Teaching Effectiveness

3.1. Experimental Tools and Subjects

In this teaching practice research, students from classes 5 and 6 of the second grade at X Middle School in a certain province of Thailand were selected as the experimental subjects. Among them, class 5 had 45 students and class 6 had 46 students, forming the experimental class and the control class respectively. Before the practical research, the first monthly examination results of the school were used as the pre-test scores for the students and analyzed. The collected scores of the two classes were subjected to independent sample t-tests using SPSS 27.0 [21].

1) Questionnaire

After the experiment, by comparing the abilities of students in the control class and the experimental class in terms of cultural empathy learning in Chinese culture, interest and attitude, cooperation ability and cooperation awareness, problem-solving ability and problem awareness, etc., the changes in students' abilities in learning cultural empathy in Chinese culture were analyzed. Therefore, based on the research direction, the author designed the "Questionnaire for Thai Junior High School Students' Cultural Empathy Learning Situation" for this study.

This questionnaire consists of 20 questions, covering the three main dimensions of "learning interest and attitude, cooperation awareness and cooperation ability, problem awareness and problem-solving ability" under this model. According to the Likert scale, each question is divided into five levels: completely agree, relatively agree, average, relatively disagree, and completely disagree, with corresponding scores ranging from 5 to 1.

2) Test Paper

Through paper-and-pencil tests, the academic performance of students is evaluated to provide feedback on the teaching effect.

3.2. Questionnaire Scale Analysis

The author developed a questionnaire scale based on existing research. To test the reliability and structural validity of the questionnaire, 20 students from each of two classes were selected and 40 students in total were given the questionnaire for a pre-survey before the official distribution of the questionnaire. A total of 40 questionnaires were distributed, and all 40 were returned, with a 100% return rate. The data was collected, preprocessed, and finally, the validity and reliability of the returned data were tested using SPSS 27.0.

The overall reliability coefficient of the questionnaire, $\alpha = 0.967$, is greater than 0.80, indicating that the reliability of this questionnaire is very good and the measurement data is reliable. It can be used as an evaluation tool for further analysis and research. The overall validity of the questionnaire is 0.808, and $\text{sig} = 0.000$, indicating that $P < 0.05$. The structural validity of this questionnaire is very good.

After the teaching experiment, 45 students from Class 5 of Grade 8 and 46 students from Class 6 of Grade 8 were given 45 and 46 questionnaires respectively, totaling 91 questionnaires. A total of 91 valid questionnaires were returned, with a 100% return rate. This study conducted data statistical analysis on the control class and the experimental class in different dimensions, and calculated the average scores for each dimension for comparison. The average scores of the experimental class in the dimensions of

problem awareness and problem-solving ability, learning interest and attitude, and cooperation awareness and cooperation ability were 29.87, 25.84, and 32.56 respectively, while the average scores of the control class in each dimension were 26.20, 23.54, and 29.11 respectively. The experimental class significantly outperformed the control class. This indicates that after teaching with the PBL-CL teaching model, students have shown positive changes in the learning of Chinese cultural empathy.

Then, independent sample t-tests were conducted for each dimension to analyze whether there are statistically significant differences between the control class and the experimental class in each dimension. The results of the independent sample t-test analysis for each dimension are shown in Table 1.

Table 1. Independent sample t test analysis results of each dimension

Dimension	Class	Case number	Standard deviation	Mean difference	Significance (double tail)
Learning interests and attitudes	Cross-reference class	46	5.1845	2.3246	0.048
	Laboratory class	45	6.0395		
Cooperation awareness and cooperation ability	Cross-reference class	46	4.7740	2.3978	0.035
	Laboratory class	45	6.1665		
Learning interests and attitudes	Cross-reference class	46	6.4938	3.6621	0.011
	Laboratory class	45	7.0516		

The students in the experimental class showed greater interest in learning about Chinese culture empathy, and their learning attitude became more positive. They also demonstrated significant improvements in aspects such as cooperative awareness and cooperative ability, as well as problem awareness and problem-solving ability. Independent sample t-tests were conducted on each of the three dimensions, and the results were all less than 0.05, indicating that compared to the control class, the students in the experimental class have significantly improved in all dimensions. The statistical results of the data on learning interest and attitude, cooperative awareness and cooperative ability, and problem awareness and problem-solving ability are shown in Tables 2, 3, and 4 respectively.

The statistical results of the data on learning interest and attitude are shown in Table 3. From the data of question 1 in the questionnaire, which asked about the students' interest in "Chinese culture empathy", and question 2, which asked about the students' feelings of happiness during the learning process, it can be seen that 68.5% and 70.7% of the students in the experimental class respectively indicated that they strongly agreed. The selection situation of these two options was significantly higher for the students in the experimental class than for the control class. This indicates that compared to the traditional teaching mode, the PBL-CL teaching mode, through the introduction of real scenarios and during the mutual learning process among students, has generated more positive emotions and enhanced students' learning interest.

Table 2. Learning interest and attitude statistics

Topic	Class	Very agree /%	Consent /%	General /%	Different meaning /%	Very different /%
1. I think Chinese culture is very interesting	Cross-reference class	46.7	25.4	14.8	8.4	4.7
	Laboratory class	68.5	16.8	14.8	0.0	0.0
2. I felt very happy in the study	Cross-reference class	36.4	34.2	14.8	6.5	8.1
	Laboratory class	70.7	12.6	12.4	2.0	2.3
3. I will study it before I study	Cross-reference class	35.0	19.5	21.2	17.0	7.3
	Laboratory class	54.0	10.3	18.7	6.5	10.5
4. I can complete all the tasks arranged by the teacher	Cross-reference class	63.7	21.0	10.5	4.5	0.3
	Laboratory class	64.5	23.0	10.3	2.0	0.2
5. I want to know more about the subject	Cross-reference class	34.2	31.8	21.2	8.6	4.2
	Laboratory class	58.4	20.5	14.5	0.0	6.6
6. I think it is important for me to learn Chinese culture	Cross-reference class	36.4	34.0	14.5	10.5	4.6
	Laboratory class	58.9	18.7	8.0	10.5	3.9

The statistical results of the data on cooperation awareness and cooperation ability are shown in Table 3. For each item, the students in the experimental class tended to express agreement and very agreement more frequently. Moreover, in questions 9 and 10, the students in the experimental class did not choose the option of very disagreement. This indicates that under the PBL-CL teaching mode, most students prefer the cooperative learning method. When there are group activities, they will actively participate in them, and during the cooperation process, they enhance the cooperation awareness such as mutual assistance and mutual learning.

Table 3. Statistical results of collaborative awareness and cooperation ability

Topic	Class	Very agree /%	Consent /%	General /%	Different meaning /%	Very different /%
7. I think the learning method of cooperative learning can improve my achievements	Cross-reference class	35.2	33.3	20.4	11.1	0.0
	Laboratory class	58.2	18.4	12.3	11.1	0.0
8. I like the way groups work together	Cross-reference class	34.6	21.2	21.7	22.5	0.0
	Laboratory class	54.9	10.3	28.5	6.3	0.0
9. When I have a problem, I like to work with my classmates	Cross-reference class	62.5	22.9	1.8	3.8	0.0
	Laboratory class	64.4	20.6	15.0	0.0	0.0
10. I am happy to help when the team members are in trouble	Cross-reference class	45.7	24.6	14.4	13.0	2.3
	Laboratory class	69.1	16.4	14.5	0.0	0.0
11. When there is a group activity, I will actively participate	Cross-reference class	37.5	33.9	14.9	10.5	3.2
	Laboratory class	71.3	12.1	12.3	4.3	0.0
12. I will actively share learning resources with group members	Cross-reference class	33.3	32.8	21.7	12.2	0.0
	Laboratory class	59.3	18.9	15.4	3.0	3.4
13. In the process of teamwork, I will not interrupt when others speak	Cross-reference class	35.1	32.7	20.4	10	1.8
	Laboratory class	57.9	19.5	13.4	7.0	2.2

The statistical results of the problem awareness and problem-solving ability are shown in Table 4. Regarding the 20th question of the questionnaire, the analysis team investigated whether group collaboration could enhance the problem-solving ability regarding the issue of empathy towards Chinese culture. 80% of the students in the experimental class agreed or strongly agreed, which indicates that there is a positive relationship between the form of group collaboration and problem-solving.

Table 4. Data statistics on problem awareness and problem solving

Topic	Class	Very agree /%	Consent /%	General /%	Different meaning /%	Very different /%
14. I often have the knowledge of the rational application in my life	Cross-reference class	35.7	34.9	20.1	8.0	1.3
	Laboratory class	57.7	18.6	11.4	11.0	1.3
15. In the preview, I often ask new questions	Cross-reference class	36.1	20.7	21.8	20.0	1.4
	Laboratory class	55.4	9.7	29.3	5.0	0.6
16. In the course of the teacher's lecture, I will ask new questions	Cross-reference class	45.9	25.1	14.5	13.1	1.4
	Laboratory class	69.3	15.8	13	0.0	1.9
17. I always answer questions in class	Cross-reference class	46.1	24.8	14.3	10.0	4.8
	Laboratory class	67.2	17.1	13.8	0.0	1.9
18. I will try to solve the complex problems	Cross-reference class	33.9	32.1	21.9	10.0	2.1
	Laboratory class	58.7	20.8	16.9	2.1	1.5
19. I will actively study summarizing and reflecting	Cross-reference class	37.2	33.8	14.7	11.0	3.3
	Laboratory class	70.4	12.4	12.5	2.0	2.7
20. I think team cooperation can improve my ability to solve Chinese cultural and common problems	Cross-reference class	35.8	32.7	21.1	6.0	4.4
	Laboratory class	60.0	20.0	15.0	5.0	0.0

3.3. Analysis of Academic Performance

This study used the examination results of the first monthly exam of two classes as the pre-test, and then used the final exam results of the two classes as the post-test. The author analyzed the impact of implementing this teaching model before and after the experiment on the scores of the experimental class based on the two sets of results. The author used EXCEL to statistically analyze the two sets of results and utilized the SPSS 27.0 version data processing software to conduct an independent sample t-test on the scores of the two classes. The group statistics and independent sample t-test results of the first monthly exam scores of the experimental class and the control class are shown in Tables 5 and 6 respectively.

In the first monthly exam results, the average monthly exam scores of the students in the two classes were 65.452 and 64.899 respectively. The difference in average scores was not significant, and the overall scores of the students in the two classes were comparable. An independent sample t-test was conducted on the scores of the two classes, with $\text{Sig} = 0.731 > 0.05$. Therefore, there was no significant difference in the variance of the scores of the two classes, and the t-test result of the previous row should be selected. $\text{Sig. (two-tailed)} = 0.225 > 0.05$, that is, there was no significant difference in the scores of the experimental class and the control class in the first monthly exam, and thus the scores can be used as research objects for the study.

Table 5. Statistics for the results of the first month

Class		N	Mean	Standard deviation	Standard error of mean
The results of the first month exam	Laboratory class	45	65.452	12.110	1.665
	Cross-reference class	46	64.899	11.984	1.604

Table 6. Independent sample t test for the first month

		Levene test of the variance equation		T test of the mean equation					
		F	Sig.	t	df	Sig. (Double side)	Mean difference	Standard error value	The 95% confidence interval limit of the difference
Let's say the variance is equal		0.125	0.731	1.215	85	0.225	2.814	2.313	-1.776
Let's say that the variance is not equal				1.215	84.412	0.225	2.814	2.314	-1.778

The group statistics of the final exam scores of the experimental class and the control class are shown in Table 7. In the final exam results, the average scores of the students in the two classes were 78.456 and 71.334 respectively. It is obvious that the final exam scores of the experimental class were higher than those of the control class, indicating that the overall performance of the experimental class was better than that of the control class.

Table 7. Statistical quantity of final examination scores

Class		N	Mean	Standard deviation	Standard error of mean
The results of the first month exam	Laboratory class	45	78.456	10.002	1.376
	Cross-reference class	46	71.334	10.521	1.422

An independent sample t-test was conducted on the final exam scores of the two classes. The test results are shown in Table 8. As $\text{Sig} = 0.634 > 0.05$ indicates, there is no significant difference in the variances of the scores of the two classes. Therefore, the t-test result of the previous row should be selected. $\text{Sig. (two-tailed)} = 0.002 < 0.05$, meaning that there is a significant difference in the final exam scores between the experimental class and the control class.

From the above data analysis, it can be seen that after implementing problem-solving group cooperative learning for one semester in the experimental class, the average score of the experimental

class exceeded that of the control class. And based on the Sig. (two-tailed) value, it can be concluded that there is a significant difference in the average scores. Based on the analysis of the regular scores and the above data of the experimental class and the control class during the teaching process, applying the PBL-CL teaching mode to the teaching of Chinese cultural empathy is beneficial to the improvement of students' grades.

Table 8. Independent sample inspection

	Levene test of the variance equation				T test of the mean equation				
	F	Sig.	t	df	Sig. (Double side)	Mean difference	Standard error value	The 95% confidence interval limit of the difference	The 95% confidence interval of the difference
Let's say the variance is equal	0.227	0.634	3.365	85	0.002	6.511	1.979	2.733	10.577
Let's say that the variance is not equal			3.371	84.710	0.002	6.511	1.974	2.740	10.572

4. Conclusion

This study constructed a teaching model for Chinese culture empathy among Thai junior high school students based on the integration of PBL-CL. This model was applied in specific teaching scenarios. Through a 20-week teaching experiment, the following conclusions were drawn.

The PBL-CL integrated teaching model significantly enhanced students' ability to empathize with Chinese culture. The average scores of the experimental class in the dimensions of problem awareness and problem-solving skills were significantly higher than those of the control class. The independent sample T-test results showed that $P < 0.05$, indicating that the problem-oriented project-based learning, which is driven by problems, can effectively stimulate students' cultural exploration awareness. The group mechanism of cooperative learning provided organizational support for a deeper understanding of the problems, and the integration of these two approaches helped students achieve a transformation from surface-level cognition to deep empathy in the process of understanding Chinese culture.

The PBL-CL integrated teaching effectively improved students' learning attitudes and cooperation abilities. The average scores of the experimental class in the dimensions of learning interest and attitude, as well as the dimensions of cooperation awareness and cooperation ability, were significantly higher than those of the control group. This indicates that the authenticity of the project tasks and the interactive nature of cooperative learning jointly stimulated students' learning motivation. It also confirms that the teaching design with a value orientation of respecting cultural differences from a comparative course perspective can reduce the psychological barriers in cultural learning.

The PBL-CL integrated teaching model has a positive promoting effect on the mastery of Chinese culture knowledge. The final scores of the experimental class were 78.456, significantly higher than those of the control class (71.334), with Sig. (two-tailed) = $0.002 < 0.05$, indicating that the experimental effect is significant. This result shows that the task-driven framework of PBL and the collaborative support mechanism of CL can form a positive interaction, be mutually conditional, and mutually promote each other, jointly promoting the effective achievement of the cultural empathy teaching goal.

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