Unlocking Potential: A Combined Situated and Project-Based Learning Approach to Foster Reading and Analytical Thinking Abilities in Primary Chinese Classrooms

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Abstract

This study developed and examined an integrated instructional framework that combines Situated Learning (SL) and Project-Based Learning (PjBL) to enhance primary students' reading comprehension and analytical thinking skills in Chinese language education. Drawing on a comprehensive literature review of relevant studies from 2018 to 2024, the framework was structured into five key pedagogical modules. To evaluate its effectiveness, a one-group pre-test and post-test quasi-experimental design was implemented with 42 fifth-grade students from a primary school in Binzhou, China. Over the course of a one-month intervention, students engaged in contextualized, inquiry-based learning activities aligned with the proposed model. The results indicated statistically significant improvements in both reading comprehension and analytical thinking following the intervention. These findings suggest that the integrated SL-PjBL approach can effectively foster higher-order cognitive skills in primary education. However, limitations such as the absence of a control group and the preliminary nature of the framework warrant further refinement and validation in future research.

Keywords: situated learning, project-based learning, reading comprehension, analytical thinking, primary education, Chinese language instruction, instructional design

1. Introduction

Education has permanently molded the student body to be critical comprehension and expression of information. With the world changing so fast and requiring more profound reading abilities and critical thinking in recent years, this has become especially important. The identification of the meaning of a text and its connection to one's life experiences form the basis of reading comprehension. Besides, analytical thinking is the opposite process, where complex connections are broken down to comprehend better a problem solution. It is the idea put forth by Alexander and the Disciplined Reading and Learning Research Laboratory that reading comprehension is one of the paramount 21st-century abilities (2012). Aside from the fact that they are essential for passing exams, they ensure educational success and provide the foundation for further learning.

As for the earlier research, its researchers, Stoffelsma and Spooren (2019), have already proved that an excellent reading comprehension is the foremost element in absolutely every word of academic work, regardless of what discipline it is connected with. Nykyporets et al. (2023) introduced the concept of analytical thinking, whose impact applies to problem-solving abilities as well as to the development of critical thinking. However, often, coping with these abilities becomes a problem for the students. Hence, primary education, which is the foundation for future learning, is crucial in this regard. Conventional pedagogical methods regularly fall short, which may not captivate pupils and create high-level thinking abilities but rather only tightly study non-inquisitive students, resulting in course marks only (Dole et al., 2016).

Situated learning posits that the best way to acquire knowledge is within contexts that are as much similar to real-life situations as possible, so that the learner becomes genuinely engaged and applies the learned information (Li et al., 2022). By practicing Project-Based Learning (PjBL), students are attached to the actual issues that invoke them to

make inquiries and teamwork, better to resolve complicated problems (Hussein, 2021). Therefore, the present study has adopted a mixed-method approach to help address this situation and design a better teaching platform to support comprehension of reading and critical thinking process among Chinese students at grade six. Consequently, the study attempt to present this by conceptualizing a hybrid which is based on situated and project- based learning.

This study explores the implementation of a hybrid instructional model that integrates Situated Learning and Project-Based Learning, both grounded in constructivist theory. These two pedagogical approaches are prioritized due to their emphasis on learner engagement through authentic contexts, social interaction, and meaningful connections to real-world experiences (Krasny et al., 2009; Žerovnik & Nančovska Šerbec, 2021). The central aim of this research is to construct a learning environment that leverages the strengths of both methods to enhance primary students' reading comprehension and analytical thinking abilities by situating knowledge acquisition within realistic and context-rich scenarios.

Typing methods of various researchers have shown that certain instructions can effectively enhance reading the text and analytical thinking abilities. For example, incorporating such cognitive strategies like paraphrasing and posing questions measurably uplifted pupils' reading rate of progress (Aghaie & Zhang, 2012). Consider how readers using a skimming and scanning strategy to study English as a foreign language (EFL) have demonstrated the strategy's effectiveness on reading comprehension (Agustin et al., 2023). Other researchers have critically reviewed teaching approaches aimed at developing analytical thinking, among which are debates, elevating metacognitive abilities, project-based and inquiry-led learning, and seeking alternatives (Spaska et al., 2021; Anthonysamay et al., 2024; Ramadani et al., 2021; Hidayat et al., 2024).

However, although the existing research has exposed the benefits, there are still some gaps to be filled. Most investigations center on conventional classroom situations; that is, they may not catch the interest of students, and they do not offer knowledge transfer to such an extent. Instituting these various procedures appears effective; however, they are usually provided separately and specifically targeting the need of integrating these methods. Such separation gets in the way of realization of the overall effect on educational outcomes. Therefore, we designed a framework of situated learning that was based on project-based learning (PjBL) approach and provided theoretical examination of its impact on student's reading comprehension and analytical thinking.

The research questions are as follows:

How can a teaching framework that integrates situated learning and project-based learning be designed to enhance elementary students' reading comprehension and analytical thinking abilities in Chinese language instruction?

Is there a statistically significant difference in students' reading comprehension and analytical thinking abilities before and after the implementation of the integrated teaching framework in elementary Chinese language education?

2. Literature Review

2.1 Reading Comprehension and Analytical Thinking

Reading comprehension involves understanding the explicit meaning of a text, interpreting its implicit messages, and relating the content to prior knowledge and experiences. In contrast, analytical thinking refers to the ability to deconstruct complex information, identify underlying patterns, and generate insightful interpretations. Both abilities are foundational to academic achievement and are widely recognized as essential components of successful learning. According to JALA (2020), strong reading ability serves as a fundamental pillar across all academic disciplines. Parmis et al. (2020) found that students with higher levels of reading comprehension also demonstrated improved overall academic performance. Moreover, analytical thinking is closely associated with critical thinking and problem-solving abilities (Nykyporets et al., 2023). While reading comprehension encompasses both basic decoding and higher-order abilities such as inference, summarization, and critical analysis, analytical thinking enables learners to systematically evaluate complex issues and propose reasoned solutions—abilities that are particularly vital for addressing real-world challenges.

In primary education, the development of reading comprehension and analytical thinking abilities is essential, as these competencies form the foundation for lifelong learning. The current Chinese curriculum places considerable emphasis on these abilities. For example, national education policy documents released in 2017 and 2020 explicitly identified reading comprehension and analytical thinking as core competencies to be cultivated in compulsory education (Fan, 2023). Despite this policy emphasis, many students continue to struggle with these abilities.

Traditional teaching approaches often fail to engage learners or foster deep understanding. While direct instruction has proven effective for conveying declarative and procedural knowledge, it may be insufficient for nurturing higher-order thinking abilities (Meok et al., 2024). Within the context of exam-oriented education, there is often a disproportionate focus on test performance rather than on the development of cognitive and analytical capacities. As a result, students may become overwhelmed when confronted with complex reading tasks that require interpretation, reasoning, and inference.

Research by Chen and Klahr (1999) suggests that the most effective instructional methods are those tailored to specific learning objectives and adapted to individual learner differences. Khellab et al. (2022) demonstrated that metacognitive reading strategies—such as summarizing and questioning—can significantly improve reading outcomes among EFL learners. Similarly, Agustin et al. (2023) highlighted the benefits of explicitly teaching skimming and scanning techniques to help students quickly identify key ideas and locate relevant details. Other research has validated the effectiveness of structured approaches such as scaffolding, the think-aloud protocol, and the SQ3R (Survey, Question, Read, Recite, Review) method in improving reading comprehension (Amin, 2023). Guided practice in analytical reasoning, as emphasized by Nguyễn and Nguyễn (2017), is also shown to be instrumental in fostering students' analytical thinking abilities. These methods, though often delivered within traditional classroom settings, rely heavily on sustained engagement, repeated practice, and strategic cognitive support. Furthermore, Nagai and York (2022) underscore the role of motivation and learner engagement in facilitating reading comprehension, advocating for the use of diverse, student-centered instructional strategies to promote active learning.

2.2 Situated Learning

Situated learning thus enables students to quite easily finalize the experience and integration of new knowledge and abilities by putting this in a real or practical context (Ledger & Fischetti, 2020; Landon-Hays et al., 2020). Integrating situated learning has considerably improved the students' abilities not only in reading comprehension but even in the area of analytical thinking. Through research, it has been observed that involvement in real or simulated contextualized situation learning activities creates more participation of the students and understanding of the knowledge as well. One of the examples is Anaktototy & Lesnussa (2022), which focused on how to apply the technique of the Directed Reading Thinking Activity (DRTA). The DRTA directs the learning process into the life of the students through the interaction of texts in real life. Eventually, students should always be predicting, cross-checking, and thinking about what they have just read. The term "situated cognitions" in the context of its central idea, which is deeply congruent with situated learning, aims at the promotion of high degree comprehension and hence application of the attained achivements to real world experiences. From the research results, students were found to have better reading comprehension when they used predicting and confirming about the reading content. This approach surely steers students to actively and meaningfully do the text analysis.

Besides, Kwangmuang et al. (2021) did a research involving designing and developing learning innovations as strategies capable of enhancing the higher-order thinking abilities of junior high school students in Thailand. In any kind of teaching, it is necessary for educators to set out problem cases that can be directly related to the student's day-to-day life to facilitate learning, and the findings of the research on this area indicate that there was a higher analytical thinking skill mean score among those learners that experienced the learning innovations than those who did not. On the one hand, situated learning could successfully reinfuse students' understanding of reading comprehension and analytical thinking by means of real and interactive learning settings and task designs that are offered by expert methodologies and techniques.

Project-learning(PjBL)

Project-Based Learning (PBL) is an instructional approach that encourages students to construct and apply knowledge independently by engaging in meaningful, extended tasks. It is particularly effective in fostering higher-order thinking abilities such as analysis, synthesis, and evaluation (Žerovnik & Nančovska Šerbec, 2021; Song et al., 2024). PBL emphasizes active learning through interdisciplinary projects that require both theoretical understanding and practical application. Within this pedagogical model, students are not passive recipients of knowledge; rather, they become active problem-solvers who work collaboratively, think critically, and engage with real-world issues that enhance the relevance and depth of learning. Recent empirical studies have supported the educational benefits of PBL. For example, Imbaquingo and Cárdenas (2023) investigated the impact of project-based learning on the English reading proficiency of ninth-grade students in a school in Quito, Ecuador. Their findings revealed that students participating in PBL not only demonstrated increased motivation but also showed significant improvements in reading test performance. The authors concluded that PBL provides a dynamic and student-centered

learning environment that promotes meaningful engagement with the content, ultimately contributing to the development of reading comprehension abilities. In a separate quasi-experimental study, Sari et al. (2021) examined whether the use of PBL would yield statistically significant improvements in reading comprehension compared to traditional instruction. The study involved non-equivalent groups and measured pre- and post-test outcomes. The results confirmed the effectiveness of PBL, showing that students who engaged in project-based learning achieved significantly higher gains in reading comprehension than those in the control group. These findings further validate PjBL' s potential as a powerful method for enhancing literacy and cognitive engagement in educational settings.

Similarly, a study by Mukti et al. (2020) further examined the impact of Project-Based Learning on students' cognitive performance across multiple domains. The researchers assessed various aspects of analytical ability, including thinking flexibility, language reasoning, reading comprehension, biological reasoning, and mechanical reasoning. The analysis of student performance revealed that PBL significantly enhanced learners' analytical thinking abilities, particularly in areas requiring integrative and higher-order reasoning. Although the improvement in reading comprehension was more modest in some contexts, other studies have confirmed PBL's broader cognitive benefits. For instance, research by Rosita et al. (2024) on the effects of project work in French reading instruction found that while gains in comprehension were moderate, students demonstrated noticeable increases in motivation and analytical reasoning abilities. These findings suggest that PBL not only supports incremental improvements in reading comprehension but also fosters deeper intellectual engagement and the development of critical thinking abilities.

3. Research Methodology

3.1 Research Design

This study adopted a mixed-method approach, incorporating both a systematic literature review and a quasi-experimental research design. First, an instructional framework that integrates situated learning and project-based learning was developed based on a comprehensive review of relevant empirical studies published between 2018 and 2024. Guided by this framework, the study then employed a single-group pre-test and post-test quasi-experimental design to examine its effectiveness. The intervention was implemented over a one-month period in the second class of the fifth grade at the Sixth Elementary School in Bincheng District, Binzhou City, China. Prior to the intervention, students' reading comprehension and analytical thinking abilities were assessed using validated instruments. Following the instructional intervention, the same assessments were administered. The pre- and post-test data were analyzed using SPSS statistical software to determine whether significant improvements had occurred in the targeted skill areas.

3.2 Literature Review Methodology

This study represents a theoretical investigation aimed at designing an instructional framework that integrates Situated Learning and Project-Based Learning (PjBL) to enhance primary school students' reading comprehension and analytical thinking abilities in Chinese language education. A systematic literature review was conducted to identify empirical studies published between 2018 and 2024 that examined the impact of these two pedagogical approaches on the development of reading and analytical abilities. The search was carried out across several authoritative academic databases, including the Education Resources Information Center (ERIC), the Science Citation Index (SCI), and the Social Sciences Citation Index (SSCI). After filtering for recent and influential studies, an in-depth analysis was performed to explore the mechanisms through which each instructional approach contributes to learning outcomes. The review findings revealed that Project-Based Learning emphasizes practice-oriented engagement and task completion, while Situated Learning focuses on authentic, context-rich learning environments. The complementarity of these approaches suggests a promising synergy for fostering deeper comprehension and higher-order thinking in primary-level Chinese instruction.

To collect relevant literature, this study employed Panda Academic Search, an advanced academic database powered by artificial intelligence and big data analytics. The platform offers fast, comprehensive, and customized search results across a wide range of disciplines, including natural sciences, engineering, humanities, social sciences, medicine, and agriculture. The primary objective was to locate peer-reviewed empirical studies published between January 2018 and November 2024 that examine the effects of instructional approaches on reading comprehension and analytical thinking. To ensure alignment with the study's objectives, four key search terms were used: "project-based learning (PjBL)," "situated learning (SL)," "analytical thinking abilities," and "reading comprehension abilities." These keywords were strategically selected to capture literature assessing the educational

impact of PjBL and SL on the development of students' higher-order cognitive abilities. The analysis of the selected studies enabled the identification of core components and implementation strategies of each approach. The findings informed the construction of a hybrid instructional framework that integrates the practice-oriented nature of project-based learning with the context-oriented foundation of situated learning—ultimately aimed at improving students' reading comprehension and analytical thinking abilities in primary Chinese language education.

3.3 Quasi-Experimental Research

3.3.1 Research Sample

The participants of the study were students in the second class of the fifth grade of the sixth elementary school in Bincheng District, Binzhou City, China. Because the school explicitly stated that students could not be treated differently, the study could only be conducted in the second class of the fifth-grade class that I teach.

Table 1. Participants Information

Items	Number	Number(Male)	Number(Female)
Sample size	42	22	20

3.3.2 Research Hypothesis

The students who engaging in instructional activity based on situated learning and project-based learning revealed higher post-test scores of reading comprehension abilities and analytical thinking abilities than pre-test scores.

3.4 Research Instruments

3.4.1 Reading Comprehension Abilities Test-Paper

The reading comprehension test used in this study was developed based on the Chinese Curriculum Standards for Compulsory Education issued by the Ministry of Education of the People's Republic of China (2022), in combination with key theoretical perspectives on Chinese reading development and relevant findings from cognitive psychology. The curriculum standards emphasize the holistic development of students' abilities to identify main ideas, analyze supporting details, make logical inferences, and use language effectively in reading tasks.

To ensure the scientific rigor and comprehensiveness of the test, its design was informed by internationally recognized assessment frameworks, such as the Programme for International Student Assessment (PISA) reading literacy framework (OECD, 2019), as well as established models of reading comprehension, including Kintsch's (1988) construction-integration model. The final assessment tool comprised 20 items distributed across five key dimensions, with four items per dimension. Each item was scored on a 5-point scale, yielding a total possible score of 100.

The five assessed dimensions were:

Main Idea Comprehension – evaluating students' ability to grasp the central theme or primary message of a text;

Detail Comprehension – assessing the ability to extract and synthesize factual information;

Inferential Reasoning – measuring the capacity to draw logical conclusions based on textual evidence;

Vocabulary Comprehension – focusing on students' recognition of new or context-specific words, including the interpretation of homonyms;

Expressive Ability – examining the ability to summarize, generalize, and articulate conclusions derived from the passage.

This test was specifically designed to capture multiple facets of reading comprehension, and its results were analyzed to evaluate the instructional intervention's impact across both basic and higher-order reading skills.

3.4.2 Analytical Thinking Abilities Assessment Scale

The analytical thinking assessment scale employed in this study was theoretically grounded in the critical thinking framework proposed by Ennis (1985), which emphasizes key cognitive processes including problem identification, information analysis, reasoning, and evaluation. To ensure content validity, the scale also drew upon established assessment models, such as the Watson-Glaser Critical Thinking Appraisal (Watson & Glaser, 1980), and incorporated dimension classifications commonly used in existing validated tools.

In alignment with the Core Literacy Standards of Disciplines issued by the Ministry of Education of the People's Republic of China (2022), and in consideration of the practical demands of analytical thinking in both academic and real-world contexts, the scale was structured around five dimensions: (1) problem understanding, (2) information collection and organization, (3) reasoning and logical thinking, (4) decision-making, and (5) self-reflection and evaluation. Each dimension included four items, totaling 20 items overall. A 5-point Likert scale was used to rate each item, ranging from 1 (strongly disagree) to 5 (strongly agree).

Problem Understanding assesses the extent to which students can accurately identify problems and extract their core elements.

Information Collection and Organization evaluates students' ability to efficiently gather relevant information and systematically categorize, classify, and summarize it for subsequent analysis.

Reasoning and Logical Thinking measures students' capacity to apply logical processes in analyzing information and generating inferences or novel solutions.

Decision-Making reflects students' ability to evaluate alternatives and make reasoned choices based on evidence and logical justification.

Self-Reflection and Evaluation examines students' metacognitive awareness of their reasoning processes, including the evaluation of method selection, the effectiveness of applied strategies, and areas for improvement.

This multi-dimensional structure ensures that the scale not only captures students' analytical capabilities but also their reflective judgment, which is essential for continuous intellectual development.

3.5 Data Collection

We used the research instrument to pre-test students' reading comprehension and analytical thinking abilities before the first instruction and again after the last instruction to post-test students' reading comprehension and analytical thinking abilities.

3.6 Data Analysis

The study employed Paired Samples T-Test to analyze the pre-test and post-test scores of reading comprehension abilities and problem-solving abilities in the experimental group, thereby testing the first hypothesis: "The students who engaging in instructional activity based on situated learning and project-based learning revealed higher post-test scores of reading comprehension abilities and analytical thinking abilities than pre-test scores".

3.7 Ethical Affirmation

This research, titled "An Instructional Approach Through Situated Learning and Project-Based Learning to Enhance Reading Comprehension and Analytical Thinking Ability for 5th Grade Students in Chinese Course", has been ethically approved by the Research Ethics Committee of Nakhon Phanom University, Thailand. This ethical approval, with the reference number HE16967 and the record number 169/2567, was issued on October 16, 2024, and is valid until October 15, 2025.

4. Results

4.1 Instructional Framework

This means that students then can better develop these abilities by contextualizing their knowledge through real-life practice (Landon-Hays et al., 2020). On the other hand, project-based learning means that students are working on tasks that require them to build their own knowledge systems and to develop a higher-order thinking skill by bringing their thoughts into contact with the reality, which is done through project-based learning (Song et al., 2024). Likewise, this investigation is based on two kinds of learning (in project-based and context) and its main aim is to create a new educational model using the interface of these two styles of learning. The second part of this project uses elements from situated and project-based learning theory in particular to make a link between the students and their environment through authentic or real-world contexts. Through project-based learning (PjBL), students start with contextual setup, project task design, group collaboration, and role assignment and go through knowledge construction by the teacher's guidance, and ultimately present results and reflect.

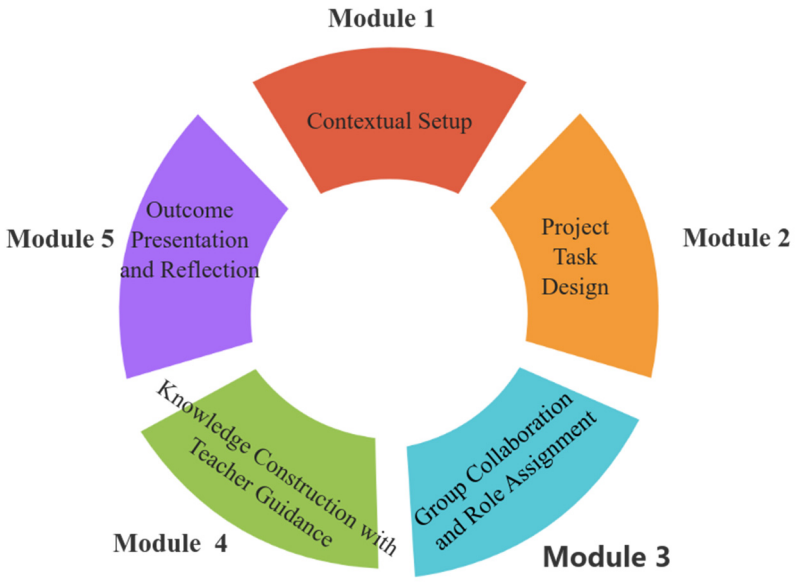

Figure 1. Illustrates Instructional Framework for Situated Learning and Project-Based Learning

This instructional framework integrates Situated Learning (SL) and Project-Based Learning (PjBL) into a structured five-module model aimed at enhancing primary students' reading comprehension and analytical thinking abilities. Module 1, Contextual Setup, employs authentic historical contexts to stimulate curiosity and intrinsic motivation. For instance, the historically significant Battle of Red Cliffs provides a realistic scenario in which students actively engage with themes such as loyalty and strategy through immersive role-playing. By utilizing multimedia resources and classroom environmental adjustments to reflect historical authenticity, students experience deeper emotional and intellectual connections to the subject matter (Ledger & Fischetti, 2020).

In Module 2, Project Task Design, students engage in structured, task-driven exploration aimed at enhancing analytical and problem-solving abilities through literary analysis. A character transformation project based on Charles Dickens' "A Christmas Carol" enables students to systematically analyze the protagonist Scrooge's evolution, supporting their analysis with textual evidence. This module promotes critical thinking by having students hypothesize about character motivations and articulate analytical findings visually and textually, effectively reinforcing knowledge construction through guided inquiry (Žerovnik & Nančovska Šerbec, 2021).

Module 3, Group Collaboration and Role Assignment, emphasizes collaborative learning and effective teamwork. Students are organized into clearly defined roles—project coordinator, researcher, analyst, and presenter—each with specific responsibilities, fostering accountability and interdependence. For example, students collaboratively investigate ecological interactions in a forest ecosystem, constructing comprehensive visual models of food webs. Regular check-ins ensure continual support and task fidelity, effectively cultivating students' collaborative and problem-solving abilities within authentic tasks (Chen & Kuo, 2019).

In Module 4, Knowledge Construction with Teacher Guidance, the instructional focus shifts to deeper conceptual understanding guided by structured teacher interventions. This approach leverages guided inquiry into complex literary themes, such as moral courage exemplified by Atticus Finch in Harper Lee's "To Kill A Mockingbird." Through structured discussion prompts and analytical tools like character motivation charts, students systematically develop their interpretative abilities. This module notably enhances students' analytical depth and clarity of reasoning, facilitating critical engagement with complex texts through directed teacher feedback (Nguyễn & Nguyễn, 2017).

Finally, Module 5, Outcome Presentation and Reflection, integrates formative assessment practices with reflective learning experiences. Students present their project outcomes using diverse media formats, such as digital slideshows or interactive posters, to effectively demonstrate their knowledge. Peer assessment rubrics guide students in critical evaluation of their peers' presentations, while self-reflection activities promote ongoing personal development and

self-awareness. This reflective approach ensures students not only master content knowledge but also gain essential metacognitive abilities, fostering continuous improvement and deeper learning engagement (Xiao & Yang, 2019).

4.2 Hypothesis Testing

The students who engaging in instructional activity based on situated learning and project-based learning revealed higher post-test scores of reading comprehension abilities and analytical thinking abilities than pre-test scores.

Table 2. Presents Comparison of Pre-Test and Post-Test in the Experiment Group

Students' Scores in Different Tests	M	SD	t	df	p
Pre-test of reading comprehension abilities	70.6	9.28			
Post-test of reading comprehension abilities	81.2	8.33	-0.62	41	0.0000
Pre-test of analytical thinking abilities	73.6	8.16			
Post-test of analytical thinking abilities	82.3	6.77	-0.51	41	0.0000

Paired Sample T-Test was conducted on the same group of students to determine whether there was a significant difference in the average test scores between two tests administered at different time points. The Paired T-Test results in Table 2 reveal a significant difference in scores between the two tests: $t(41) = --0.62$, $t(41) = -0.51$, $p < 0.05$. On average, students scored higher on the second test compared to the first test. With mean differences (MD) of 9.6 and 8.7, and pooled standard deviations around 8.81 and 7.47 respectively, the effect sizes (d) were estimated at 2.61 and 3.31, indicating a large effect size as per Cohen (1988). Consequently, the students engaged in the instructional approach based on situated learning and project-based learning, show higher of reading comprehension abilities and analytical thinking abilities, than before learning.

5. Discussion

5.1 Summary of the Study

This study proposes an integrated instructional model that combines Situated Learning (SL) and Project-Based Learning (PjBL) to enhance fifth-grade students' reading comprehension and analytical thinking skills. Within this framework, SL provides authentic, context-rich learning environments that allow students to construct knowledge through meaningful, real-world experiences. Concurrently, PjBL engages students in the completion of original, complex tasks that require critical thinking, problem-solving, and collaborative inquiry. By synthesizing the core features of both approaches, the study developed a structured pedagogical model consisting of five sequential phases: contextual immersion, project engagement, teacher-guided knowledge construction, final presentations, and reflective analysis.

Grounded in the principles of social constructivism, this framework emphasizes the importance of active participation and collaborative meaning-making in fostering deep conceptual understanding. The quasi-experimental results confirmed the efficacy of this approach, revealing significant improvements in students' reading comprehension and analytical thinking following the instructional intervention. These findings suggest that the combined application of SL and PjBL offers a powerful strategy for promoting higher-order cognitive development in the context of primary Chinese language education.

5.2 Comparison with Previous Research

In contrast to previous studies, this research offers an innovative contribution by integrating Situated Learning (SL) and Project-Based Learning (PjBL) within a unified instructional framework, rather than applying them in isolation. While earlier studies have individually demonstrated the strengths of SL in facilitating knowledge application within authentic, real-world contexts (Landon-Hays et al., 2020; Kwangmuang et al., 2021), and the effectiveness of PjBL in fostering students' critical thinking, motivation, and problem-solving abilities (Imbaquingo & Cárdenas, 2023; Mukti et al., 2020), few have explored their synergistic potential. For instance, Imbaquingo and Cárdenas (2023) found that PjBL significantly enhanced both reading comprehension and learner engagement.

However, the majority of existing literature tends to examine SL and PjBL as separate pedagogical strategies, overlooking the complementary strengths that may arise from their integration. This study addresses this gap by conceptualizing and implementing a hybrid model that leverages the contextual authenticity of SL alongside the

task-oriented knowledge construction inherent in PjBL. Furthermore, this approach aligns with prior research on effective metacognitive strategies—such as summarization and questioning—for improving reading comprehension (Aghaie & Zhang, 2012; Khellab et al., 2022). Yet, it moves beyond strategy-level interventions by emphasizing instructional design elements that promote sustained inquiry, collaborative learning, and deeper engagement with complex texts.

5.3 Teaching Recommendations

Several key considerations should be addressed when designing and implementing an integrated teaching model that combines Situated Learning and Project-Based Learning. First, the learning context and project task design must be deliberately constructed to reflect real-world situations. Authentic and contextualized tasks are more likely to engage students meaningfully, fostering deeper cognitive and emotional involvement in the learning process (Roach et al., 2018; Miller et al., 2021). Second, educators should not only facilitate knowledge acquisition but also actively support students in constructing their own understanding through guided inquiry and reflective practices. The role of the teacher shifts from knowledge transmitter to learning facilitator, encouraging students to take ownership of their learning (Kim, 2019; Xiao & Yang, 2019). Finally, successful implementation of this model requires collaborative group structures where students are assigned clearly defined roles. This structured collaboration enhances team cohesion, promotes peer accountability, and cultivates essential skills in communication and cooperative problem-solving (Forslund Frykedal & Hammar Chiriac, 2018; Chen & Kuo, 2019). Role clarity and task interdependence are crucial to maximizing group effectiveness and ensuring that each learner contributes meaningfully to the project.

5.4 Limitations of the Study

This study has several limitations that should be acknowledged. First, the instructional framework was primarily developed through a literature-based synthesis, which may limit its empirical robustness and generalizability. Second, the quasi-experimental design involved only a single group of participants, without a control or comparison group, which constrains the ability to draw causal inferences about the effectiveness of the intervention. As a result, the findings may be influenced by contextual or sample-specific factors rather than the instructional model itself. To address these limitations, future research should seek to refine and validate the instructional framework through iterative cycles of implementation and evaluation across diverse educational settings. Expanding the participant pool and incorporating randomized controlled trials or comparative designs would strengthen the reliability and external validity of the findings. Moreover, longitudinal studies could further assess the sustained impact of the integrated Situated Learning and Project-Based Learning model on students' reading comprehension and analytical thinking over time.

6. Conclusion

In conclusion, this study developed and implemented an instructional framework that integrates Situated Learning and Project-Based Learning to enhance students' reading comprehension and analytical thinking skills in the context of primary Chinese language education. Employing a one-group pre- and post-test quasi-experimental design, the study demonstrated that the integrated framework significantly improved students' performance in both targeted domains. While the findings are promising, certain limitations must be acknowledged, including the use of a single sample group and the preliminary nature of the framework's design, which was primarily derived from literature synthesis rather than extensive empirical validation. Despite these constraints, the study offers a valuable foundation for future investigations. Subsequent research should focus on refining the framework, applying it across varied educational settings, and employing more rigorous experimental designs to strengthen its generalizability and theoretical grounding.

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Authors contributions

Dr. Nirat Jantharajit were responsible for study design and revising. Prof. Tinnakorn Attapaiboon was responsible for data collection. Prof. Xingxing Xiang drafted the manuscript and revised it. All authors read and approved the final manuscript. In this paragraph, also explain any special agreements concerning authorship, such as if authors contributed equally to the study.

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