Exploration and Implementation of Project-Based Learning in Cultivating Students' Critical Thinking in Junior High School English Teaching

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Abstract: This study focuses on junior high school English teaching and explores practical approaches to developing students' critical thinking through Project-Based Learning (PBL). Grounded in the requirements for thinking quality stipulated in the Compulsory Education English Curriculum Standards (2022 Edition), it elaborates on the compatibility between PBL and critical thinking development. Driven by authentic and complex problems and student-centered, PBL allows students to complete project tasks and solve real-world problems through group collaboration. Centered on learning by doing, it highlights the integrated development of knowledge application, higher-order thinking and core competencies. Its implementation consists of three stages: goal clarification and project design, collaborative inquiry and problem-solving, as well as product presentation, evaluation and reflection. Future research can be advanced in three directions: expanding interdisciplinary project themes, establishing a hierarchical project design system, and developing critical thinking assessment tools, so as to better fulfill the essential goal of English education in the core-competency era — equipping students to examine the world critically and express rational viewpoints in English.

Keywords: Project-Based Learning; Critical Thinking; Junior High School English Teaching; Core Competencies

1. Introduction

The Compulsory Education English Curriculum Standards (2022 Edition) (hereafter referred to as the New Curriculum Standards) stresses the guiding role of core competencies, among which thinking quality constitutes a key dimension reflecting students' mental characteristics. Thinking quality refers to students' individual cognitive features, manifested in their understanding, analysis, comparison, inference, evaluation and creation. Its improvement helps students identify, analyze and solve problems and make proper value judgments. As an essential component of thinking quality, critical thinking is embedded in intercultural communication, the essential nature of English teaching. Cultivating students' critical thinking is embedded in intercultural activities, meets the developmental goals of core competencies, guarantees the formation of innovative thinking, helps resolve learning difficulties, and promotes the progressive improvement of cognitive skills and literacy.

Junior high school is a critical stage for students' cognitive development. Cultivating critical thinking in English teaching not only enhances students' logical, rigorous and flexible thinking, but also promotes the development of core competencies and learning effectiveness. Specifically, critical thinking deepens students' understanding of English linguistic structures and functions; enables them to view foreign cultures objectively and rationally; helps them adjust learning strategies and improve efficiency; and fosters innovative and learning abilities urgently needed in modern society. In short, cultivating critical thinking is of great significance. Project-Based Learning serves as a bridge between classroom knowledge and real-world application. Driven by authentic problems, it enables students to naturally develop higher-order thinking skills such as questioning, analyzing and creating through collaborative inquiry. As John Dewey observed, "Thinking arises from a problematic situation and develops in solving problems", which provides strong theoretical support for integrating PBL and critical thinking in junior high school English teaching.

2. Connotation and Strategies of Project-Based Learning

Project-Based Learning (PBL) is a project-centered instructional model. In the early 20th century, John Dewey proposed the philosophy of learning by doing, emphasizing that students acquire knowledge through practical activities and hands-on experience, laying a foundational theoretical basis for PBL. Kilpatrick first defined PBL and outlined its four stages: purpose-setting, planning, implementation and evaluation. According to the Buck Institute for Education (BIE), PBL is an instructional approach in which students gain knowledge and skills by engaging in meaningful projects in authentic contexts through group cooperation [1]. Liu and Zhong defined PBL as an inquiry-based learning model based on core disciplinary concepts, conducted via multiple resources in real-world settings, and divided it into six steps: project selection, planning, inquiry, production, presentation and evaluation [2]. Shafaei & Rahim addressed the vocabulary bottleneck in foreign language learning. Based on an empirical study, they explored the impact of project-based learning on vocabulary development. The findings verified that project-based learning can not only broaden the scope of students' vocabulary knowledge, but also deepen their in-depth understanding of words, offering a new perspective to resolve the fragmentation of vocabulary acquisition [3]. Wang summarized the implementation process of project-based teaching into five stages: project selection, plan formulation, activity implementation, work creation and achievement demonstration. She emphasized that applying project-based teaching in daily education can effectively advance quality-oriented education, integrate textbook knowledge with practical operation, and foster students' comprehensive competence and innovative thinking [4]. Karyawati and Ashadi thought the practice of project-based learning (PBL) can be broken down into four key dimensions: disciplinary focus, collaborative engagement, real-world problem-solving, and iterative development.

Disciplinary focus requires teachers to guide students to engage with core subject knowledge, strengthen their logical reasoning, and encourage them to conduct subject-specific inquiry and practice. Collaborative engagement emphasizes teachers fostering students' teamwork skills and independent decision-making abilities. Real-world problem-solving involves teachers grounding learning in authentic contexts, enabling students to apply their knowledge to practice and develop a sense of social responsibility.

Iterative development centers on teachers supporting students in reflecting on and revising their work, while providing timely feedback on task progress and challenges [5]. Guo regarded PBL as both a curriculum form and a teaching strategy — a comprehensive, activity-based educational practice in which students conduct autonomous learning by integrating multidisciplinary knowledge on the basis of systematic subject learning [6]. In terms of reading skill training, Zhang confirmed through empirical research that systematic metacognitive strategy training including prediction, questioning, summarizing and questioning can improve students' reading comprehension accuracy and effectively enhance their independent reading ability [7]. Wang and Yang further integrated project-based learning with the cultivation of cultural literacy in junior high school English. Guided by unit themes and driven by driving questions, they enabled students to integrate cultural knowledge and make cultural value judgments while completing project tasks. This ultimately realizes the coordinated development of students' language competence, cultural awareness and critical thinking ability, reflecting the high-level breakthrough of project-based learning from simple language skill training to the cultivation of disciplinary core competencies [8]. Wang et al. pointed out that project-based learning contributes to the improvement of students' language proficiency, the development of core competencies and the optimization of teaching modes. Driven by authentic tasks, it enables students to consolidate linguistic knowledge and enhance language skills through practical language application, which serves as its core advantage [9]. Hao et al. further focused on how project-based learning promotes in-depth learning. They not only put forward a specialized instructional design theory, but also illustrated the matching approach between teaching objectives and project tasks with specific cases, providing practical and operable implementation strategies for the application of relevant theories in teaching practice [10]. In this study, PBL is defined as a student-centered instructional model driven by real and complex problems, in which students complete tasks, solve practical problems, construct knowledge

and develop abilities through group collaboration. Its core is learning by doing, emphasizing the integration of knowledge application, higher-order thinking and core competencies. Following Liu Jingfu and Zhong Zhixian's framework, PBL is structured into three phases:

2.1 Goal Clarification and Project Design

Projects must be selected in line with teaching objectives. First, projects should focus on core disciplinary knowledge and core competencies to avoid meaningless formalistic activities. Second, projects should be student-centered, matching students' cognitive levels and interests to stimulate intrinsic motivation. Third, projects should be operable with visible outcomes: tasks feature clear pathways and decomposable steps suitable for students' abilities; final products are concrete and observable rather than abstract thinking processes, facilitating self, peer and teacher assessment and enhancing students' sense of achievement.

2.2 Collaborative Inquiry and Problem-Solving

This is the core stage for knowledge acquisition and ability development. Students are divided into heterogeneous groups with clear roles and responsibilities. During inquiry, they access and process information through multiple channels, design and integrate solutions, focus on problem-solving to form preliminary plans, revise schemes in practice, and carry out verification, implementation and feedback.

2.3 Product Presentation and Evaluation

Visualized presentation externalizes the process and results of inquiry and problem-solving, demonstrating learning outcomes and supporting reflection and evaluation. Products include written works, multimedia works, physical objects and activity-based outputs. Multi-dimensional evaluation is adopted with diverse assessors, combining process-based and summative assessment.

3. Theoretical and Educational Foundations of PBL for Critical Thinking

Cultivating critical thinking via PBL essentially integrates its core elements — questioning, analyzing, evaluating and creating — into the whole learning process through thinking practice in authentic problem contexts. It is supported by both theoretical and educational foundations.

3.1 Theoretical Foundations

Constructivist Learning Theory: Learning is an active process of knowledge construction through exploration and interaction. In PBL, students independently analyze problems, design solutions and test hypotheses, which involves critical information screening and knowledge reconstruction. Bloom's Taxonomy of Educational Objectives: Cognitive objectives progress from lower-order skills (remembering, understanding) to higher-order skills (analyzing, evaluating, creating). PBL tasks require students to analyze problems, evaluate solutions and create products, fully aligning with higher-order thinking development. Dewey's "Learning by Doing": Dewey held that education is life and growth, and thinking develops through solving real problems. PBL situates students in real problems, requiring them to identify core issues, gather evidence, judge information credibility, make reasoned decisions and form logical solutions, thus developing critical thinking in practice.

3.2 Educational Objectives

PBL aligns with the requirements of core competencies and social needs, especially the thinking quality objective in the 2022 English Curriculum Standards. By engaging in problem-solving in authentic contexts, students naturally develop critical thinking. The design process of project-based learning are showed in Table 1 and implementation steps of project-based learning are showed in Table 2.

4. Design Process of Project-Based Learning

Taking Module 6 Animals in Danger (Grade 8 Volume 1, FLTRP) as an example, this project is designed around the theme of "Human and Nature", introducing endangered animals (especially giant pandas), their current conditions and conservation measures. It aims to raise students' awareness of animal and environmental protection and explore practical solutions. Guided by PBL, closely connected projects are designed to develop core competencies and critical thinking through contextualized thinking, participation, scheme-designing, problem-solving and evaluation.

Table 1. Design Process of Project-Based Learning

Project Theme Small Actions	Big Changes: Protect Our Animal Neighbors
Learning Objectives	Language Competence: Master vocabulary related to endangered animals (endangered, habitat, protect, extinct, reserve, etc.), cause-effect expressions (because, due to, as a result, so that, etc.) and suggestion structures (We should… / It's important to… / Let's…). Use English to describe endangered conditions, analyze causes and propose measures, and produce posters, proposals and short videos for accurate information delivery and opinion expression. Cultural Awareness: Understand global challenges and international cooperation in wildlife protection, and grasp the significance of "a community with a shared future for mankind" in ecology. Compare Chinese and foreign conservation concepts, establish values of respecting nature and life, and oppose animal cruelty. Thinking Quality: Develop causal reasoning through the chain of "problem – cause – solution". Think dialectically about human activities and animal survival, propose feasible conservation strategies to strengthen critical thinking, and design creative plans to foster innovation. Learning Ability: Collaborate in groups, listen to peers, optimize expression and design, improve communication and teamwork. Conduct independent research on interested species through English books and documentaries (e.g., Planet Earth) to develop autonomous learning habits.
"Animals in Danger Interdisciplinary Integration"	Biology: Ecosystem principles — food chain rupture, habitat loss and species endangerment; ecological approaches to wildlife protection. Geography: Environmental changes — climate change, sea-level rise and impacts on polar animals. Morality and Rule of Law: Values and social responsibility; awareness of individual duty to protect animals. Information Technology: Online information screening; short video recording and editing. Art: Poster layout and design; combining text and images to inform, impress and motivate action.

5. Implementation Steps of Project-Based Learning

This table outlines a PBL teaching process themed on animal protection. It starts with situational introduction, followed by project grouping, knowledge research, scheme creation, and ends with result presentation and multi-faceted evaluation, aiming to boost students' interest and develop their language and collaboration skills.

Table 2. Implementation Steps of Project-Based Learning

Teaching Objectives	Teaching Activities	Activity Effects
Create authentic contexts and activate prior knowledge	1. Introduce the topic of volunteer rescue of stray animals. Launch the project "Small Actions, Big Changes: Protect Our Animal Neighbors" to encourage ideas and participation. 2. Play Planet Earth clips about endangered animals and ask: "Do you know any other endangered animals?" "Why are these animals in danger? What can we do to help them?"	Authentic contexts arouse enthusiasm. Videos focus attention and activate prior knowledge, helping teachers assess students' foundation.
Project selection and group formation	3. Students choose project types: poster, article or video with teacher guidance. 4. Teachers form mixed-ability groups and provide learning scaffolds; students assign roles independently.	Choice based on interests enhances motivation. Scaffolded role assignment improves cooperation and problem-solving skills.
Knowledge construction and research	5. Students read Unit 1 to summarize status, causes and protection methods. Teachers provide supplementary readings. 6. Groups collect English information about different endangered animals (teacher monitors to avoid repetition).	Reading and supplementary materials build knowledge. Group inquiry encourages active engagement.
Scheme design and creation	5. Groups create products based on selected forms and collected data with teacher scaffolds. Poster: introduction, endangerment causes, slogans. Video: English voice-over, images, problem-solution logic. Proposal: English letter to global teenagers with "we should/can…".	Teacher feedback and guidance ensure quality and progress.
Product presentation	7. Groups present their works in English.	Presentation boosts confidence and demonstrates learning outcomes.
Evaluation	8. Criteria: content accuracy, language proficiency, logic and creativity, teamwork. Assessors: self-evaluation, peer evaluation, teacher evaluation.	Multi-dimensional evaluation helps students identify weaknesses and improves fairness.

6. Conclusion

This study explores the practical path of PBL in fostering critical thinking and verifies the effectiveness of the three-stage model: goal clarification and project design, collaborative inquiry and problem-solving, and product presentation, evaluation and reflection. As a bridge between classroom learning and the real world, PBL empowers students to develop the

habit of analyzing issues rationally and solving problems critically in English through learning by doing. Future research can be deepened in three ways: first, exploring interdisciplinary expansion to broaden the application of critical thinking; second, establishing a graded project system to suit students' cognitive development at different grades; third, developing targeted critical thinking assessment tools for more precise instructional guidance. The ultimate value of PBL lies not only in knowledge construction in class, but also in cultivating students' ability to view the world critically and express rational views in English — the core pursuit of English education in the era of core competencies.

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