

Parental Perspectives on PBL Implementation in Basic Education: Developing an Evaluation Indicator System

Limin Zhang^{1,*}, Ruichun Wang¹, Yinghan Chen¹, Xinmin Jin²

¹School of Computer Science and Intelligence Education, Lingnan Normal University, Zhanjiang, 524048, Guangdong, China

²School of Mechanical and Electrical Engineering, Lingnan Normal University, Zhanjiang, 524048, Guangdong, China

*zhanglm@lingnan.edu.cn

Abstract: Project-Based Learning (PBL) has gained considerable traction in basic education as an instructional approach that fosters deeper learning, critical thinking, and interdisciplinary competencies. Despite its growing adoption, systematic evaluation of PBL implementation quality from stakeholders' perspectives remains underdeveloped, particularly regarding parental perceptions—a critical yet frequently overlooked dimension. This study addresses this gap by developing a comprehensive evaluation indicator system for PBL implementation in basic education grounded in parental perspectives. Drawing upon a multi-dimensional theoretical framework, we constructed a hierarchical indicator system comprising 5 first-level indicators (Thematic Insight, Process Reconstruction, Guarantee Assessment, Environment Creation, and Vision Guidance), 25 second-level indicators, and multiple third-level observation points, corresponding to a 25-item parental survey instrument. The system is designed to capture parents' cognition of PBL, evaluation of learning processes and curriculum needs, assessment of resource guarantees, perceptions of home-school-community collaboration, and expectations regarding cultural identity and future development. Beyond the indicator framework, we delineate a complete application protocol encompassing survey instrument development, data collection procedures, and results interpretation strategies. The indicator system offers both theoretical rigor and practical utility, serving as a diagnostic tool for school-level PBL quality monitoring, a reference for regional education policy formulation, and a framework for stakeholder engagement in educational innovation. Future research directions include empirical validation across diverse school contexts, cross-cultural adaptation, and integration with student outcome measures.

Keywords: Project-Based Learning (PBL); evaluation indicator system; parental perspectives; basic education; home-school collaboration; educational evaluation

1. Introduction

Project-Based Learning (PBL) has gained increasing prominence as an instructional approach in basic education worldwide, characterized by student-centered inquiry, interdisciplinary integration, and the cultivation of twenty-first-century competencies (Kokotsaki, Menzies, & Wiggins, 2016). In China, the introduction of the "Double Reduction" policy in 2021 and the Compulsory Education Curriculum Plan in 2022 have created institutional space for inquiry-based learning, providing unprecedented policy support for PBL. A growing number of schools have thus begun adopting PBL as a core instructional strategy.

Despite this momentum, a persistent challenge remains: the lack of systematic, stakeholder-informed evaluation frameworks for assessing PBL implementation quality. Existing evaluation efforts predominantly focus on student outcomes while overlooking the perspectives of key stakeholders whose support is essential for sustainable implementation (Condliffe et al., 2017). Among these stakeholders, parents occupy a uniquely critical position. As both observers of and participants in their children's education, parents' understanding of and support for PBL directly influence student motivation, home-school collaboration quality, and ultimately the sustainability of implementation (Jeynes, 2012). In the Chinese context, where parents hold strong expectations regarding academic achievement, understanding their perspectives on PBL becomes particularly consequential.

However, systematic instruments for capturing parental perspectives on PBL implementation are notably absent in the existing literature. While several evaluation frameworks have been developed from teacher or student perspectives, few studies have centered on parental perceptions, and even fewer have operationalized these perceptions into a theoretically grounded and practically applicable indicator system.

This study addresses this gap by developing an evaluation indicator system for PBL implementation in basic education from the parental perspective. The system is intended to serve as a diagnostic tool for school-level quality improvement, a reference framework for policy formulation, and a bridge for fostering meaningful parental engagement in educational innovation.

2. Theoretical Foundations and Literature Review

2.1 Project-Based Learning: Conceptual Foundations

PBL is an instructional approach in which students learn through sustained engagement in authentic, complex projects that require inquiry, research, and the creation of tangible outcomes (Larmer, Mergendoller, & Boss, 2015). Thomas (2000) identified five defining features: curricular centrality, driving questions, constructive investigations, student autonomy, and authentic contexts. Implementation quality varies substantially across schools, requiring not only well-designed curriculum and qualified teachers but also adequate resources, a supportive school culture, and family understanding and support (Condliffe et al., 2017).

2.2 Parental Perspectives on PBL

The importance of parental perspectives is well established in the literature. Epstein's (2018) overlapping spheres of influence theory posits that student development is optimized when families, schools, and communities share consistent goals. When parents understand PBL's pedagogical rationale and observe its positive effects, they tend to become strong advocates for its continuation (Mergendoller & Thomas, 2005). Conversely, a lack of understanding may breed skepticism or resistance (Larmer & Mergendoller, 2010). Parents' understanding of and support for instructional approaches directly influence the sustainability of educational innovations. Currently, most existing instruments focus either on general parental involvement or on student outcomes, with few bridging these domains through a comprehensive parental perception evaluation framework.

2.3 Evaluation Indicator Systems in Education

Indicator systems provide structured frameworks for measuring complex educational constructs. A well-designed system typically features a hierarchical structure—from overarching dimensions through specific indicators to measurable observation points. In PBL evaluation, the Buck Institute's Essential Project Design Elements (Larmer, Mergendoller, & Boss, 2015) and Chen and Yang's (2019) framework for Chinese primary schools have been influential, yet both predominantly draw on teacher and researcher perspectives.

The existing literature reveals three significant gaps. First, parental perceptions are largely overlooked in PBL evaluation frameworks. Second, instruments that address parental involvement rarely focus specifically on PBL's distinctive characteristics. Third, the practical pathways for translating evaluation frameworks into usable school-based tools remain underexplored. The present study addresses these gaps by constructing an evaluation indicator system centered on parental perspectives.

3. Indicator System Development

3.1 Guiding Principles

The development of the Parental Perceptions of PBL Implementation Indicator System (PPBL-IS) was guided by five principles:

Principle 1: Stakeholder-centeredness. The system centers on parental perceptions as primary data. Indicators must reflect what parents understand, experience, value, and perceive, rather than assuming

alignment with teacher or researcher perspectives.

Principle 2: Comprehensiveness. The system should capture the full spectrum of parental perceptions—from cognitive understanding to evaluative judgments to behavioral intentions—covering all critical aspects of PBL implementation that parents are positioned to observe and evaluate.

Principle 3: Hierarchical structure. Following established practices in educational indicator development, the system adopts a three-tier structure: first-level indicators (broad dimensions), second-level indicators (specific themes), and third-level indicators (observable items).

Principle 4: Operationalizability. Indicators must be directly translatable to survey items that are clear, specific, and appropriate for parents with diverse educational backgrounds. The resulting instrument should be concise enough for practical administration.

Principle 5: Theoretical grounding. Indicator selection and organization should be anchored in established theories of PBL implementation quality, parental involvement, and educational evaluation, ensuring construct validity.

3.2 Theoretical Framework and Indicator Sources

The indicator system was developed through an iterative, theory-driven process that integrated multiple theoretical sources, policy documents, and empirical literature.

The framework draws on the Buck Institute's Essential Project Design Elements (Larmer & Mergendoller, 2010), which emphasize authentic problems, student voice and choice, sustained inquiry, critique and revision, and public products. Epstein's (2018) overlapping spheres of influence theory informed the home-school-community collaboration dimensions. Stakeholder perception theory (Freeman, 1984) provided justification for centering on parental perspectives as a distinct and valid source of evaluation data. The system was also calibrated against China's Compulsory Education Curriculum Plan, the "Double Reduction" policy, and contemporary discourse on culturally responsive education and AI integration. A systematic review of PBL and educational evaluation literature (2010–2025) was conducted to identify thematic domains of parental concern and perception.

Through this integrative process, five first-level dimensions emerged, as summarized in Table 1.

Table 1. Five Dimensions of the PPBL-IS Framework

Dimension	Rationale
I Thematic Insight	Parents' cognitive understanding of PBL principles; their awareness and initial value judgments form the foundation for subsequent support or resistance
II Process Reconstruction	Parents' perceptions of how PBL changes learning processes; their views on instructional effectiveness and resource needs
III Guarantee Assessment	Parents' evaluation of school-level implementation conditions—time, personnel, materials, and support systems
IV Environment Creation	Parents' perceptions of home-school-community collaboration quality—a key predictor of PBL sustainability
V Vision Guidance	Parents' expectations regarding cultural integration and future competencies—the ultimate goals parents associate with PBL

These five dimensions follow a logical progression from parents' cognitive foundations, through their perceptions of processes and support conditions, to their expectations for outcomes. This structure parallels the cognitive-affective-conative sequence in attitude theory (Eagly & Chaiken, 1993) while remaining grounded in the practical realities of PBL implementation.

3.3 Hierarchical Indicator Structure

The PPBL-IS adopts a three-tier hierarchical structure comprising 5 first-level indicators, 25 second-level indicators, and 30 third-level observation points. The complete framework is presented in Table 2.

Table 2. Parental Perceptions of PBL Implementation Indicator System (PPBL-IS)

Indicator	Description (Observation Points)	Item
I Thematic Insight: Educational Cognition and Needs		
I-1 Perceived PBL Superiority	PBL outperforms traditional instruction	Q6
I-2 Participation Expectations	Desire for more PBL opportunities	Q7
I-3 Conceptual Understanding	Knowledge of PBL core elements	Q8
I-4 Outcome Satisfaction	Satisfaction with PBL achievements	Q9
I-5 Perceived Difficulties	Student challenges: time, design, inquiry, cases	Q10
II Process Reconstruction: Learning Approaches and Curriculum Needs		
II-1 Curriculum Alignment	PBL helps master curriculum knowledge	Q11
II-2 Developmental Value	PBL stimulates interest and future development	Q12
II-3 Teacher Competence Trust	Trust in teachers' PBL guidance ability	Q13
II-4 Technology Empowerment	AI tools support project completion	Q14
II-5 Resource Needs	Needs: content, training, hardware, practice bases	Q15
III Guarantee Assessment: Resources and Support		
III-1 Time Guarantee	Sufficiency of PBL instructional time	Q16
III-2 Interpersonal Support	Adequacy of peer and teacher support	Q17
III-3 Hardware Guarantee	Sufficiency of equipment and learning spaces	Q18
III-4 Resource Utility	Perceived effectiveness of school resources	Q19
III-5 Improvement Priorities	Priorities: content, training, partnership, and equipment	Q20
IV Environment Creation: Home-School-Community Collaboration		
IV-1 Home-School Communication	Smoothness and quality of parent-teacher communication	Q21
IV-2 Parental Understanding	Understanding and active support for PBL	Q22
IV-3 Parental Participation	Willingness to provide resource support	Q23
IV-4 Outcome Presentation	Opportunities for public presentation of outcomes	Q24
IV-5 Collaboration Diagnosis	Issues: time, community, school resources, and standards	Q25
V Vision Guidance: Cultural Identity and Future Expectations		
V-1 Cultural Integration	Local culture integration stimulates interest	Q26
V-2 Competency Development	Local culture PBL enhances comprehensive abilities	Q27
V-3 Cultural Knowledge	Parental familiarity with local culture	Q28
V-4 Technology-Culture Integration	Expectation for AI + local culture integration	Q29
V-5 Educational Outcomes	Outcomes: identity, problem-solving, application, teamwork	Q30

The five first-level indicators form a coherent progression. Thematic Insight represents parents' cognitive foundation—their understanding and initial value judgments about PBL. Process Reconstruction captures perceptions of how PBL transforms learning processes and what resources are needed. The Guarantee Assessment evaluates whether the school provides adequate conditions and support. Environment Creation addresses the collaborative ecosystem—home, school, and community—that sustains implementation. Vision Guidance articulates the ultimate outcomes parents value and expect from PBL.

3.4 Survey Instrument Alignment

The indicator system directly corresponds to a 25-item parental survey (Q6–Q30), excluding background information items (Q1–Q5: geographic region, occupational field, school type, child's grade level, and educational attainment). Table 3 maps each indicator to its corresponding survey item type.

Table 3. Indicator-Survey Item Correspondence

Indicator Type	Corresponding Indicators	Number	Data Type
Likert-scale (5-point)	I-1, I-2, I-3, I-4, II-1, II-2, II-3, II-4, III-1, III-2, III-3, III-4, IV-1, IV-2, IV-3, IV-4, V-1, V-2, V-3, V-4	20	Quantitative
Ranking	I-5, II-5, III-5, IV-5, V-5	5	Ordinal

4. Application Protocol

4.1 Survey Instrument Administration

The indicator system is operationalized through a 25-item survey instrument comprising two sections. The background information section (Q1–Q5) collects respondent characteristics, including geographic region, occupational field, school type (categorized as island school, coastal city school, inland city school, or inland township school), the child's grade level, and parental educational attainment. The perception items section (Q6–Q30) consists of twenty 5-point Likert-scale items (1 = Strongly Disagree to 5 = Strongly Agree) measuring agreement with PBL-related statements, alongside five ranking-format items requiring respondents to order options by difficulty, urgency, importance, severity, or priority. The survey should be administered following standardized procedures: providing clear written instructions, ensuring anonymous responses, offering optional oral clarification for lower-literacy respondents when needed, and acknowledging parental time contribution at the conclusion.

4.2 Scoring and Data Processing

For the twenty Likert-scale items, descriptive statistics—mean, standard deviation, and percentage of agreement (scores ≥ 4)—should be calculated for each indicator, providing information on central tendency, response variability, and the prevalence of positive perceptions. For the five ranking items, reverse scoring is applied by assigning weights of 4 for rank 1, 3 for rank 2, 2 for rank 3, and 1 for rank 4, with weighted means then computed across all respondents. Higher weighted means indicate greater perceived difficulty, greater urgency of need, greater severity of problem, or greater importance as a priority. For composite scoring, the average of the five constituent second-level indicator scores is computed for each first-level indicator, yielding a composite score ranging from 1 to 5 that represents the overall level of parental perception on that dimension.

4.3 Results Interpretation and Feedback Strategies

Meaningful interpretation of indicator results requires tailoring to specific stakeholder audiences. For school administrators, radar chart visualizations of the five first-level composite scores should be presented to enable immediate identification of strengths and improvement priorities, with item-level breakdowns pinpointing actionable targets. For teachers and curriculum leaders, disaggregated second-level indicator scores should be provided alongside descriptions of instructional implications; low scores on technology empowerment, for example, would suggest a need for professional development in integrating AI tools. For parents, individual-level feedback should be delivered in accessible, formative formats that emphasize child-specific strengths and growth opportunities rather than competitive rankings. For policymakers, data should be aggregated at district or regional levels to identify systematic patterns and disparities, such as urban-rural differences in resource guarantee or coastal versus inland differences in cultural integration. For comparative analysis, school type and grade level serve as grouping variables for subgroup comparisons, allowing researchers to examine whether parental perceptions vary systematically by geographic context or student age.

5. Discussion

5.1 Theoretical Contributions

The PPBL-IS makes several theoretical contributions to the literature on educational evaluation and PBL research.

First, the PPBL-IS addresses a notable gap in PBL evaluation frameworks by centering on the parental perspective. Existing evaluation instruments predominantly draw on teacher assessments, student self-reports, or researcher observations. While these perspectives are essential, they do not capture parents' unique vantage point—observing their children's learning processes at home, understanding their affective responses, and experiencing the home-school interface. The PPBL-IS provides a systematic framework for incorporating this valuable perspective.

Second, the indicator system operationalizes the multidimensionality of parental perceptions. Rather than treating "parental support" or "parental satisfaction" as monolithic constructs, the PPBL-IS breaks

perceptions into five theoretically grounded dimensions, enabling more nuanced diagnosis and targeted intervention.

Third, the PPBL-IS establishes a progressive logic for understanding parental perceptions—from cognition to evaluation to expectations—that can inform theoretical models of stakeholder support for educational innovation. This progression suggests that parental support is not binary but develops through stages: initial understanding leads to evaluation, evaluation informs needs and priorities, and these in turn shape long-term expectations and support behavior.

5.2 Practical Implications

The PPBL-IS offers several practical implications for school leaders and teachers. For school leaders, the indicator system provides a practical diagnostic tool for assessing parental readiness for PBL implementation. Schools planning to introduce or expand PBL can administer the survey prior to implementation to gauge parental understanding, concerns, and support levels, and periodically thereafter to monitor changes and address emerging issues. For teachers, the PPBL-IS can inform professional development and communication strategies. Should data reveal low scores on Conceptual Understanding (I-3), schools may need to provide clearer explanations of PBL goals and processes through information sessions, newsletters, or demonstration projects. Should low scores emerge on Home-School Communication (IV-1), teachers might consider providing more structured and frequent updates regarding PBL activities.

5.3 Limitations and Future Research Directions

Several limitations of this study should be acknowledged. **Empirical validation.** The PPBL-IS framework requires rigorous empirical validation through large-scale field testing. Future research should establish the instrument's internal consistency reliability, test-retest reliability, content validity, construct validity, and criterion-related validity. **Cross-context applicability.** While the PPBL-IS was developed within the Chinese basic education context, its applicability to other cultural and educational systems remains to be explored. Cross-cultural studies could investigate whether the five dimensions maintain their structure and validity in other countries, or whether indicator weights require contextual adaptation. **Integration of multiple stakeholder perspectives.** A comprehensive understanding of PBL implementation quality requires integrating perspectives from teachers and students as well. Future research should develop and validate parallel instruments for these stakeholders to provide more robust criterion-related validity evidence for the PPBL-IS.

6. Conclusion

PBL has emerged as a signature pedagogical approach in twenty-first-century education. In China, its momentum has been significantly amplified by the "Double Reduction" policy and the 2022 curriculum reforms. Yet the success and sustainability of PBL implementation depend not only on school readiness and teacher capacity but also on the understanding, support, and engagement of parents—a critical stakeholder whose perspectives have been largely overlooked.

This study has addressed this gap by developing the PPBL-IS, a comprehensive, theoretically grounded, and practically applicable evaluation framework. The system centers explicitly on the parental perspective, operationalizes parental perceptions through a hierarchical indicator structure, and provides a complete application protocol enabling schools, districts, and researchers to administer the survey, analyze data, and generate meaningful interpretations for improvement.

The PPBL-IS serves multiple purposes: as a diagnostic tool for schools to assess parental readiness and identify areas for communication and support; as a monitoring framework for districts and policymakers; and as a research instrument to investigate relationships between parental perceptions, implementation quality, and student outcomes. Through systematic, stakeholder-informed evaluation, the PPBL-IS can help schools better understand and engage parents in the PBL process, ultimately fulfilling PBL's promise of providing students with deeper, more meaningful, and more future-oriented learning experiences.

Acknowledgement

This research was supported by the Higher Education Teaching Reform Project of Guangdong Province: Official Letter No. YJ [2024]-30 of the Education Department; and Guangdong Provincial Education Science Planning Project (Higher Education Special Program) (Grant No. 2022GXJK255).

References

- [1] Chen, X., & Yang, J. (2019). *Construction and application of evaluation indicator system for project-based learning in primary schools*. *Journal of Educational Studies*, 15(3), 89–97.
- [2] Condliffe, B., Quint, J., Visher, M. G., Bangser, M. R., Drohojowska, S., Saco, L., & Nelson, E. (2017). *Project-based learning: A literature review*. MDRC.
- [3] Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Harcourt Brace Jovanovich.
- [4] Epstein, J. L. (2018). *School, family, and community partnerships: Preparing educators and improving schools* (2nd ed.). Westview Press.
- [5] Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Pitman.
- [6] Jeynes, W. (2012). *A meta-analysis of the efficacy of different types of parental involvement programs for urban students*. *Urban Education*, 47(4), 706–742.
- [7] Kokotsaki, D., Menzies, V., & Wiggins, A. (2016). *Project-based learning: A review of the literature*. *Improving Schools*, 19(3), 267–277.
- [8] Larmer, J., & Mergendoller, J. R. (2010). *Seven essentials for project-based learning*. *Educational Leadership*, 68(1), 34–37.
- [9] Larmer, J., Mergendoller, J., & Boss, S. (2015). *Setting the standard for project based learning: A proven approach to rigorous classroom instruction*. ASCD.
- [10] Mergendoller, J. R., & Thomas, J. W. (2005). *Managing project based learning: Principles from the field*. *The Interdisciplinary Journal of Problem-based Learning*, 1(1), 7–27.
- [11] Thomas, J. W. (2000). *A review of research on project-based learning*. The Autodesk Foundation.