

Elementary School Teachers' Perceptions of the Effectiveness of PBL in Merdeka Curriculum Learning

Sagaf S. Pettalon^{1✉}

UIN Datokara Palu, Indonesia

e-mail: [* bakungs670@yahoo.com](mailto:bakungs670@yahoo.com)¹

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ABSTRACT

The implementation of Problem-Based Learning (PBL) within the Merdeka Curriculum requires elementary school teachers to assume more active, reflective, and facilitative roles. However, the effectiveness of PBL is strongly influenced by teachers' perceptions of its relevance, practicality, and learning impact. This study analyzes elementary school teachers' perceptions of PBL effectiveness using a descriptive qualitative method through a systematic narrative review. Literature identification, screening, and eligibility assessment followed a PRISMA-based process, resulting in 26 relevant sources for analysis. The findings reveal that teachers' perceptions are shaped by conceptual understanding, prior experience, ability to design authentic problems, and the level of support provided by the school environment. Positive perceptions lead to more consistent implementation, whereas negative perceptions are commonly associated with time constraints, limited resources, and insufficient training. The discussion highlights several strategies to strengthen PBL effectiveness, including practice-oriented professional development, collaborative planning, authentic assessment, and supportive school leadership. This study concludes that teachers' perceptions are a key determinant of successful PBL implementation and must be strengthened through systemic interventions to ensure effective and sustainable learning within the Merdeka Curriculum.

INTRODUCTION

The implementation of the Merdeka Curriculum in elementary schools in Indonesia has been one of the biggest educational transformation agendas in the last two decades. This curriculum emphasizes competency-based learning, differentiation, and the strengthening of student agency, which places students as active, reflective, and independent learners. One of the learning models recommended in the Merdeka Curriculum is Problem-Based Learning (PBL), which is designed to stimulate problem solving, critical thinking, collaboration, and contextual learning relevant to everyday life (Nasution, 2021). In line with the direction of the Merdeka Belajar policy, PBL is

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considered capable of developing the Pancasila Student profile, especially in terms of creativity, critical thinking, and independence. Thus, the success of PBL greatly depends on the understanding, readiness, and perception of teachers as the main implementers of the curriculum in the classroom (Damayanti & Muhroji, 2022).

The phenomenon that has emerged in the field shows that there are significant variations in the implementation of PBL in primary education units, both in public and private schools. A report by the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek, 2023) shows that 65% of elementary school teachers stated that they still experience obstacles in planning PBL scenarios, especially in designing authentic problems that are appropriate for the developmental level of students. In addition, 58% of teachers reported difficulties in managing group dynamics and process assessment in PBL. This condition shows that teachers' understanding of the basic principles of PBL still needs to be strengthened. In this context, teachers' perceptions are a determining factor in the successful implementation of PBL, because positive perceptions will increase motivation to try, modify, and maintain this learning model on an ongoing basis (Yafie et al., 2024).

At the global level, various studies have proven the effectiveness of PBL in increasing student participation, higher-order thinking skills, and independent learning, especially at the primary education level (Ayuni et al., 2025). However, the effectiveness of PBL is greatly influenced by the quality of implementation, school support, and teachers' pedagogical readiness. A study in Finland, for example, shows that teachers with a strong understanding of PBL design tend to be able to implement more collaborative learning and successfully improve learning outcomes (Ayuni et al., 2025). In Indonesia, similar findings were reported by Maros et al., 2023, who showed that the application of PBL in elementary schools can improve students' critical thinking skills, but the results are highly dependent on the teachers' ability to facilitate group discussions and final reflections. This condition indicates that teachers' perceptions of the ease, relevance, and effectiveness of PBL are one of the key factors in the successful implementation of the Merdeka Curriculum.

Nationally, the implementation of PBL is also influenced by infrastructure readiness, school culture, and teachers' pedagogical competence. A report by Balitbang (Puslitjakdikbud, 2023) found that many elementary school teachers still perceive that PBL requires more time than conventional methods, making it difficult to implement given the limited number of class hours. In addition, 53% of teachers stated that they needed more in-depth training on discussion facilitation strategies and authentic assessment in the context of PBL. Such perceptions are important to study because they can influence teachers' decisions to use or not use PBL consistently.

From an educational psychology perspective, teachers' perceptions greatly determine their pedagogical attitudes and actions in the classroom. The Teacher Belief System theory states that teachers' beliefs and perceptions of a learning model directly influence the quality of learning planning, implementation, and reflection (Pajares, 1992; Fitriyah, 2024). If teachers view PBL as an effective model that is relevant and appropriate for elementary school students, they are more likely to implement PBL optimally. Conversely, negative perceptions can lead to the implementation of PBL becoming merely a formality without deep pedagogical meaning. Research by Wildani et al., (2025) shows that teachers' perceptions of the ease of using PBL are a major predictor of its successful implementation in elementary schools.

In addition, the implementation of PBL is also closely related to contextual factors such as school leadership support, collaboration between teachers, and the availability of teaching tools. Research by Muyassaroh et al., (2023) confirms that teachers who work in a collaborative environment are better able to implement PBL consistently because of the support of ideas, sharing of good practices, and collaboration in designing problems and assessments. This is important because the Merdeka Curriculum gives schools the freedom to develop their own operational curriculum, so the success of PBL is largely determined by the collaborative culture built in the school.

Although many studies confirm the benefits of PBL, there are important research gaps that need to be addressed. First, the study “Teacher Readiness for PBL in Elementary Schools” by Ahmad & Ismail (2020) only highlights teachers' readiness in general without examining teachers' specific perceptions of the effectiveness of PBL, particularly in the context of the Merdeka Curriculum. Second, the study “Implementation Barriers of PBL in Primary Education” by Blongkod et al., (2023) focuses on implementation barriers but does not link these findings to how teachers' perceptions of PBL effectiveness influence their pedagogical decisions. Third, the study “The Impact of Problem-Based Learning on Elementary Students' Skills” by Nugroho et al. (2021) confirms the success of PBL in improving students' 21st-century skills, but does not explore how teachers' perceptions as implementing agents influence this success.

Thus, there is still room for research to explore the relationship between elementary school teachers' perceptions and the effectiveness of PBL in the context of implementing the Merdeka Curriculum. The novelty of this study lies in its focus on specifically examining elementary school teachers' perceptions of the effectiveness of PBL in the actual conditions of implementing the Merdeka Curriculum, a relatively new and transitional educational context.

This study also offers a new contribution by analyzing teachers' perceptions from pedagogical, psychological, and structural (school support and policy) perspectives, thus providing a more comprehensive picture of the factors that influence the application of PBL in elementary school learning.

The purpose of this study is to analyze elementary school teachers' perceptions of the effectiveness of PBL in Merdeka Curriculum learning, including teachers' perceptions of the relevance of PBL, ease of implementation, challenges faced, and the extent to which teachers assess PBL's ability to improve students' learning skills in accordance with the Pancasila Student Profile. The findings of this study are expected to provide practical implications for teachers, schools, and policy makers in improving the quality of PBL implementation in elementary schools.

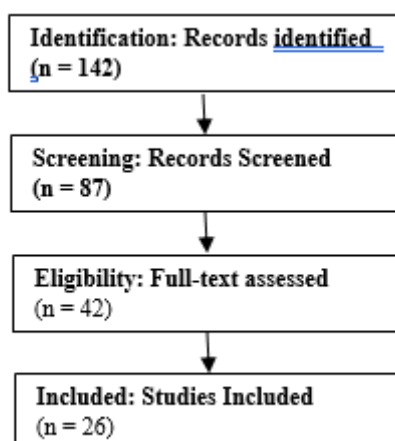
METHODOLOGY

This study uses a descriptive qualitative method with a systematic narrative review approach to examine elementary school teachers' perceptions of the effectiveness of Problem-Based Learning (PBL) in the Merdeka Curriculum. This method was chosen because it is suitable for exploring diverse empirical findings from previous studies while allowing for in-depth thematic analysis without quantitative limitations such as meta-analysis (Snyder, 2019). This approach combines a systematic search of literature from reputable journals, scientific books, and educational research reports relevant to the implementation of PBL and the Merdeka Curriculum. The focus of the analysis is on how

teachers interpret the effectiveness of PBL, implementation constraints, and pedagogical and structural factors that influence their perceptions (Xiao & Watson, 2019).

The literature search process was conducted in three main stages, namely identification, screening, and feasibility analysis based on the PRISMA procedure. Data sources were obtained from scientific databases such as Scopus, ERIC, Google Scholar, and ScienceDirect using the keywords: “Problem-Based Learning,” “elementary teachers' perception,” “Kurikulum Merdeka,” “primary education,” and “teacher beliefs.” The articles listed were selected based on inclusion criteria, namely published in the last ten years, relevant to the context of primary education, and directly discussing teachers' perceptions of innovative learning models. Articles that were conceptual without empirical data or that did not discuss PBL in the context of primary education were excluded from the analysis (Braun & Clarke, 2021).

The next stage was thematic analysis to identify patterns in teachers' perceptions of the effectiveness of PBL in the Merdeka Curriculum. Thematic analysis was conducted through a process of coding, categorization, and drawing conclusions based on key issues such as perceptions of PBL effectiveness, teacher readiness, structural constraints, and institutional support. This analytical approach allowed researchers to obtain a comprehensive picture of how elementary school teachers assess and interpret the application of PBL in the context of the Merdeka Curriculum (Nowell et al., 2017).



RESULTS AND DISCUSSION

Elementary School Teachers' Perceptions of the Relevance and Pedagogical Goals of PBL in the Merdeka Curriculum

Teachers' perceptions are a fundamental element in the successful implementation of Problem-Based Learning (PBL) in elementary schools, especially in the context of the Merdeka Curriculum, which emphasizes teacher autonomy, differentiated learning, and the strengthening of higher-order thinking skills. Teachers' understanding of the pedagogical objectives of PBL greatly determines the extent to which this learning model can be consistently applied in the classroom. Various studies confirm that teachers' perceptions are one of the most influential factors in pedagogical decision-making, including in choosing learning models and instructional strategies (Pajares, 1992; Ratminingsih et al., (2025)). If teachers view PBL as a relevant model that can increase student engagement and is in line with curriculum objectives, its implementation will be more optimal. However, when teachers consider PBL to be too complex, unsuitable for

elementary school students, or difficult to implement in diverse classroom settings, this model will tend to be used only to a limited extent.

In the context of the Merdeka Curriculum, the relevance of PBL becomes even stronger because this model directly supports the development of the Pancasila Student Profile, especially in the dimensions of critical thinking, cooperation, and creativity. Research in elementary schools in various countries shows that PBL can improve critical thinking, problem solving, and collaboration skills, which are core competencies of the 21st century (Ayuni et al., 2025; Wildani et al., 2025). However, teachers' perceptions of the effectiveness of PBL are not always linear with this empirical evidence. Many teachers conceptually understand that PBL has great benefits, but in practice feel that the implementation of PBL does not always provide optimal results due to time constraints, lack of experience, and variations in student competencies. This is reflected in a study by Muyassaroh et al., (2023) which found that teachers' perceptions of the relevance of PBL are greatly influenced by their previous experience in implementing problem-based learning.

One of the factors that most influences teachers' perceptions of the effectiveness of PBL is their understanding of the pedagogical objectives of this model. PBL is not intended to simply solve problems, but to stimulate deep learning through the experience of actively constructing knowledge (Nasution, 2021). Teachers who understand this basic concept tend to have a more positive perception of the benefits of PBL in encouraging students to learn independently, seek information from various sources, and develop higher-order thinking strategies. Conversely, teachers who view PBL as merely unstructured group activities or discussions tend to assess that PBL does not have a significant impact on student learning outcomes. A study by Maros et al., 2023 shows that teachers' understanding of PBL principles is highly correlated with their perceptions of learning effectiveness, particularly students' critical and creative thinking skills.

In addition to conceptual understanding, teachers' perceptions are also influenced by the suitability of PBL to the cognitive development characteristics of elementary school students. Many teachers argue that elementary school students have a limited attention span and require a simpler learning structure. This view often causes teachers to hesitate to fully implement PBL because they are concerned that students will not be able to follow all stages of problem solving. However, research shows that with proper scaffolding, elementary school students are able to actively engage in PBL and demonstrate improvements in metacognitive abilities and social skills (Artisari et al., 2024).

Thus, the perception that PBL is too complex for elementary school students actually reflects the challenges of teacher adaptation rather than student inability. Teachers' perceptions are also greatly influenced by their direct experience in implementing PBL. Teachers who have successfully implemented PBL with the support of training and supervision tend to have more positive perceptions. Conversely, failed experiences or inefficient implementation often lead to negative perceptions of this model.

In a study by Blongkod et al., (2023), teachers who felt they lacked clear technical guidance on problem scenarios and facilitation steps tended to view PBL as a burdensome model. This factor was also found in a report by Balitbang (Puslitjakdikbud, 2023), which noted that 53% of elementary school teachers found it difficult to develop authentic problems relevant to students' lives. The inability to design appropriate problems can hinder the learning process and lower teachers' perceptions of the effectiveness of PBL.

Apart from pedagogical factors, teachers' perceptions of the effectiveness of PBL are greatly influenced by the work environment, school support, and collaborative culture. In the context of the Merdeka Curriculum, schools are given the freedom to design operational curricula and learning strategies according to their needs. However, this freedom can be an obstacle for teachers who are not accustomed to working collaboratively. Research by Muyassaroh et al., (2023) shows that teachers who work in a collaborative environment have a more positive perception of PBL because they have the opportunity to exchange ideas, design problems together, and discuss assessment strategies. Conversely, teachers who work individually tend to view PBL as a model that requires excessive preparation time.

Pedagogical competence is also an important factor that influences teachers' perceptions of PBL. Teachers who have better pedagogical literacy, especially in project-based or inquiry-based learning, tend to view PBL as a natural extension of the constructivist approach they are familiar with. However, teachers who are accustomed to lecture or structured exercise methods tend to assess that PBL requires too much energy, time, and flexibility in classroom management. These findings are in line with the report by Hodges et al. (2020), which shows that teachers' perceptions of new technologies and methods are greatly influenced by their pedagogical readiness and previous teaching experience.

In terms of curriculum objectives, teachers' perceptions of the effectiveness of PBL are also greatly influenced by their understanding of the objectives of the Merdeka Curriculum. This curriculum emphasizes more contextual, holistic, and competency-oriented learning. Teachers who understand the direction of the curriculum policy tend to see PBL as a method that is suitable and in line with the national education mission. Conversely, teachers who do not yet understand the philosophy of the Merdeka Curriculum will view PBL as an additional burden that does not have a direct impact on students' cognitive achievements. This can be seen in the study by Vanttaja & Järvelä (2020), which shows that teachers with a strong understanding of the curriculum have a more positive perception of PBL.

Overall, elementary school teachers' perceptions of PBL are greatly influenced by conceptual understanding, direct experience, school support, pedagogical competence, and understanding of the objectives of the Merdeka Curriculum. Positive perceptions will encourage more effective and sustainable implementation of PBL, while negative perceptions can hinder the adoption of PBL even though this model is in line with national education policy. Therefore, mapping teachers' perceptions is an important step in understanding teachers' readiness and needs in implementing PBL in elementary schools.

Obstacles to PBL Implementation and Factors Shaping Elementary School Teachers' Perceptions

The implementation of Problem-Based Learning (PBL) in elementary schools faces various obstacles that directly influence teachers' perceptions of the effectiveness of this learning model. These obstacles are not only technical-didactic in nature, but also structural, psychological, and cultural. Teachers' perceptions are shaped by their experiences, pedagogical beliefs, classroom situations, student competencies, and school support. Therefore, a deep understanding of the various obstacles that arise in the PBL implementation process is important to understand why teachers have different perceptions about the effectiveness of this model (Nasution, 2021).

One of the main obstacles faced by teachers is limited time for learning. PBL is known as a model that requires a long process, starting from problem identification, information gathering, group discussions, presentation of results, to reflection. This condition often conflicts with the limited time allocation in the elementary school curriculum, making it difficult for teachers to complete all stages of PBL thoroughly (Wildani et al., 2025). A study by Blongkod et al., (2023) shows that teachers tend to adapt PBL to be simpler (even using only some of the stages) due to their busy teaching schedules. As a result, teachers' perceptions of the effectiveness of PBL become less positive because they feel that this model is “time-consuming” and difficult to implement regularly.

In addition to time constraints, teachers' pedagogical competence is also a determining factor. Not all teachers have sufficient knowledge or experience regarding the basic concepts of PBL, including how to design authentic problems, manage discussions, and conduct process assessments. PBL requires teachers to act as facilitators who help students build knowledge independently, rather than as the main source of information. This paradigm shift is not always easy to implement, especially for teachers who have long been accustomed to traditional learning models such as lectures or structured exercises (Ayuni et al., 2025). Damayanti & Muhroji's (2022) research found that elementary school teachers who have not mastered discussion facilitation strategies tend to view PBL as a confusing and ineffective model.

From the students' perspective, variations in academic ability and discipline also greatly affect the success of PBL. Elementary school students generally have varying levels of cognitive development, so they need more intensive scaffolding to be able to complete problem-based tasks. Teachers often argue that PBL is difficult to implement in highly heterogeneous classes, because weaker students tend to just follow their peers' instructions without really understanding the issues being discussed (Artisari et al., 2024). This makes teachers question the effectiveness of PBL in improving conceptual understanding, especially for students with low academic abilities or unstable learning motivation.

The next obstacle is the availability of learning facilities and resources. PBL requires relevant teaching materials, supportive learning media, and access to adequate information. However, many elementary schools, especially in remote areas or with limited budgets, do not have adequate facilities to support student exploration activities (Rachmadtullah et al., 2020). Teachers working in schools with limited resources tend to view PBL as an ideal model that is difficult to implement in practice. The lack of teaching tools such as companion books, PBL modules, or digital media causes teachers to adapt PBL in a minimalist and suboptimal manner. This situation creates the perception that PBL is only suitable for implementation in certain schools with better resources.

School leadership support also plays an important role in shaping teachers' perceptions. Schools that have an innovative vision and support active learning tend to be more successful in implementing PBL consistently. Principals who provide collaborative spaces, mentoring-based supervision, and professional development help teachers feel more confident in applying innovative learning models (Wu & Wu, 2021). Conversely, schools with a bureaucratic culture and minimal innovation make teachers reluctant to try models that demand high pedagogical creativity. When the school culture is not supportive, teachers will view PBL as an additional method that is not urgent.

Teachers' internal factors such as confidence, willingness to learn, and attitude toward innovation also greatly determine their perception of PBL. Teachers who have a

growth mindset tend to be more open to new approaches and see challenges as learning opportunities. Research by Fives & Buehl (2016) shows that teachers' beliefs about their ability to manage complex learning are closely related to positive perceptions of innovative methods. In the context of PBL, teachers who feel they have adequate pedagogical capacity will view PBL as an effective model, while teachers with low self-confidence will view PBL as a difficult and impractical model.

In addition to individual factors, teachers' perceptions are also shaped by their previous experiences in implementing PBL. Successful experiences will reinforce positive perceptions, while failed experiences tend to reduce teachers' motivation to try again. Many teachers report that on the first attempt, PBL often does not run smoothly because students are not yet accustomed to independent learning patterns. However, after several attempts, students begin to show adaptation and improvement in their ability to work together and think critically (Nasution, 2021). Unfortunately, some teachers stop early before seeing this development, so their perceptions of the effectiveness of PBL become less objective.

From a professional development perspective, teachers' perceptions are influenced by the frequency and quality of the training they receive. Theoretical PBL training without practical guidance often does not result in significant changes in teaching practices. Nasution et al. (2021) found that teachers who participated in practice-based training were more likely to understand the steps of PBL and have a positive perception of its effectiveness. Therefore, training programs developed by schools or the government must take into account the practical needs of teachers so that they are able to implement PBL with confidence.

Assessment is also one of the biggest obstacles. PBL requires authentic assessment, process observation, and dynamic assessment rubrics. Teachers often find it difficult to develop assessments that comprehensively describe students' thinking processes. In many schools, assessment is still oriented towards final results, not the learning process. This condition makes teachers feel that PBL is not in line with the demands of the assessment administration (Damayanti & Muhroji, 2022). This incompatibility reinforces the perception that PBL is difficult to implement consistently in the field.

Overall, the obstacles to implementing PBL are caused by a combination of structural, pedagogical, psychological, and environmental factors. Teachers' perceptions are shaped by the interaction of these factors, so that variations in teachers' perceptions of the effectiveness of PBL can be understood as a reflection of the implementation challenges they face on a daily basis. Without systemic interventions in the form of continuous training, leadership support, and the provision of adequate resources, teachers' perceptions of PBL are likely to remain diverse and affect the quality of its implementation in the classroom.

Strategies to Improve the Effectiveness of PBL and Strengthen Positive Perceptions of Elementary School Teachers in the Context of the Merdeka Curriculum

Efforts to improve the effectiveness of Problem-Based Learning (PBL) in the Merdeka Curriculum learning process are highly dependent on strategies that can strengthen teachers' positive perceptions, because perceptions are a determining factor in motivation, readiness, and the successful implementation of innovative learning (Pajares, 1992; Ratminingsih et al., (2025)). Many studies emphasize that the effectiveness of PBL is not only determined by the quality of the learning design, but mainly by the attitudes

and beliefs of teachers regarding the benefits and feasibility of this model in the context of classroom learning (Nasution, 2021). Therefore, the strategies developed must include pedagogical support, strengthening professional competencies, providing resources, and forming a collaborative school culture. These strategies not only address technical barriers but also shape teachers' views that PBL is a relevant, effective, and feasible model to be consistently implemented in elementary schools.

One of the main strategies is to provide comprehensive and ongoing professional training. Training on PBL is not enough to be delivered in the form of lectures or theoretical presentations; teachers need hands-on experience in designing, facilitating, and evaluating problem-based learning. Nasution et al. (2021) emphasize that practice-based training through workshops, microteaching, and instructional mentoring is more effective in improving teacher competence than theoretical training. Teachers who have had the opportunity to practice tend to have higher confidence in implementing PBL, as they have experienced the PBL process as both learners and facilitators. In addition, ongoing mentoring is essential so that teachers feel supported when encountering difficulties in the initial implementation, which is often a factor in negative perceptions of the effectiveness of this model.

Another important strategy is to strengthen teachers' ability to design authentic, contextual problems for elementary school students. Designing good problems is central to PBL, as the quality of the problems determines the depth of discussion, the relevance of learning, and the success of students in finding solutions (Wildani et al., 2025). Many elementary school teachers report difficulty in finding or creating problems that are realistic, appropriate to students' cognitive development, and relevant to their lives (Krishnan et al., 2019). To overcome this obstacle, schools can form teams of teachers to develop a shared problem bank. This collaboration will help teachers share ideas, enrich their perspectives, and reduce individual workloads. In Finland, a similar strategy has proven effective in improving the quality of PBL planning and strengthening teachers' perceptions of the model's feasibility (Ayuni et al., 2025).

In addition to training and collaboration in planning, increasing the effectiveness of PBL also requires the provision of adequate learning resources and facilities. PBL requires access to information, learning media, and teaching materials that support student exploration and investigation. Schools that provide simple digital devices such as tablets, educational videos, or thematic modules have proven to be able to support a smoother implementation of PBL (Artisari et al., 2024). However, providing facilities does not always have to be expensive. Simple media such as pictures, real objects, children's articles, and the school environment can be authentic sources of problems if teachers are able to use them creatively. Teachers who have access and pedagogical freedom to modify learning resources tend to have a more positive perception of PBL.

The next important factor is the formation of a collaborative culture in schools. Elementary school teachers often work individually due to high administrative demands and a school culture that does not facilitate professional collaboration. In fact, the implementation of PBL requires collaboration in planning, implementation, and evaluation to reduce teachers' workload while improving the quality of learning. Muyassaroh et al., (2023) found that schools with a high collaborative culture showed better PBL success rates than schools that did not have a space for teacher collaboration. In the context of the Merdeka Curriculum, collaboration is also related to the development of operational curricula, formative assessments, and the design of projects to strengthen the Pancasila Student Profile. A work environment that supports collaboration will

reinforce teachers' perception that they are not working alone in facing the complexities of PBL.

From an assessment perspective, teachers need to be strengthened in authentic assessment competencies in line with PBL principles. Many teachers expressed confusion in assessing students' thinking processes, collaboration skills, and reflection, so they tended to revert to traditional assessments that were oriented towards final results (Damayanti & Muhroji, 2022). To improve this perception, schools need to provide clear rubrics, examples of work, and adaptable assessment standards. Authentic assessment training based on real examples from the classroom greatly helps teachers understand how to evaluate the learning process more objectively. Thus, teachers' perceptions of the feasibility of PBL will improve because they feel they have more structured evaluation tools.

In addition to these strategies, the success of PBL is also influenced by the support of school leadership. Principals play an important role in creating a safe environment for teachers to experiment with new learning models. Principals who provide space for reflection, reward innovation, and provide regular collaboration time will help teachers improve their positive perception of PBL. Hodges et al. (2020) show that leadership support is one of the strongest predictors of the long-term use of pedagogical innovation. In the context of the Merdeka Curriculum, principals can act as agents of change who ensure that PBL is not only viewed as a curriculum requirement, but as a meaningful pedagogical practice that comprehensively builds student competencies.

To provide a brief overview of key strategies that can increase the effectiveness of PBL and strengthen teachers' perceptions, a descriptive table in English is included below.

Table 1. Key Strategies to Strengthen Teachers' Perceptions and Improve PBL Implementation

Strategy Area	Description of Key Actions
Professional Development	Provide hands-on workshops, mentoring, and continuous training to enhance teachers' pedagogical confidence.
Collaborative Planning	Establish teacher teams to design contextual problems and share best practices.
Learning Resources	Ensure availability of media, digital tools, and contextual materials to support problem exploration.
Authentic Assessment	Develop clear rubrics and sample tasks to guide the evaluation of students' learning processes.
School Leadership Support	Create a supportive school culture, promote innovation, and provide time for teacher collaboration.

Before and after the table, the discussion has explained that these strategies are not only intended to overcome technical obstacles, but also to change teachers' beliefs about the feasibility and effectiveness of PBL. Positive perceptions will increase teachers' confidence, encourage reflective practice, and stimulate more consistent adoption of PBL in the classroom. Conversely, without systemic support strategies, teachers' perceptions

of PBL will remain diverse and may hinder the quality of learning in the Merdeka Curriculum.

Ultimately, strengthening teachers' perceptions of PBL must be a top priority because perceptions are the foundation of pedagogical action. Effective implementation of PBL is impossible without a strong belief in its benefits. With the support of training, collaboration, adequate resources, supportive leadership, and authentic assessment, elementary school teachers can develop sustainable positive perceptions and ultimately improve the quality of problem-based learning in the era of the Merdeka Curriculum.

CONCLUSION

The results of the discussion show that elementary school teachers' perceptions play an important role in determining the effectiveness of Problem-Based Learning (PBL) implementation in the Merdeka Curriculum. Teachers with a strong conceptual understanding of the objectives of PBL, positive experiences in its implementation, and support from a conducive school environment tend to have more positive perceptions, enabling them to implement PBL more consistently and with higher quality. Conversely, teachers who face obstacles such as time constraints, difficulties in designing authentic problems, lack of discussion facilitation skills, and limited resources tend to have negative perceptions that impact the effectiveness of PBL in the classroom.

To improve the effectiveness of PBL, systemic strategies are needed, ranging from practice-based professional training, inter-teacher planning collaboration, provision of learning resources, strengthening of authentic assessment, to school leadership support. All of these strategies have been proven to change teachers' perceptions of the feasibility and benefits of PBL in the context of the Merdeka Curriculum. With positive perceptions, teachers are better able to act as learning facilitators and encourage the formation of 21st-century competencies in students.

The recommendations of this study emphasize the need to improve the quality of practice-focused PBL training, improve learning facilities, form teacher learning communities, and strengthen school leadership capacity. Furthermore, follow-up research could expand its focus to include student perceptions, the long-term impact of PBL on competency achievement, or variations in teacher perceptions between schools with different characteristics. With the support of a stronger educational ecosystem, PBL can become an effective and sustainable learning model in realizing the objectives of the Merdeka Curriculum.

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