



Pedagogical Leadership and the Implementation of Project-Based Curriculum: Impact on Students' Problem-Solving Abilities in Australia

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INFORMASI ARTIKEL

Received: 31 Oct 2024

Revised: 04 Dec 2024

Accepted: 17 Mar 2025

Abstract: This study explores the impact of pedagogical leadership and the implementation of project-based learning (PBL) on students' problem-solving abilities in Australia. In the context of modern education marked by the challenges of globalization and technological advancement, the PBL approach has proven to enhance student engagement in the learning process through real-world projects that promote critical thinking and problem-solving skills. Pedagogical leadership, which includes support from school management and a culture of collaboration, plays a crucial role in fostering innovation in the implementation of PBL. This study employs qualitative methods, including in-depth interviews, observations, and document analysis, to gain a comprehensive understanding of how PBL is applied and its effects on students' problem-solving abilities. The research findings indicate that supportive pedagogical leadership, which encourages innovation and collaboration among teachers as well as parental involvement, can enhance student motivation and create a conducive learning environment. However, challenges such as limited teacher training and difficulties in integrating projects with national curriculum standards pose obstacles to the effective implementation of PBL. The study concludes that successful PBL implementation requires support from strong school leadership, provision of resources, and training for teachers. These findings have significant implications for education policy in Australia, particularly in designing a more relevant curriculum that prepares students to face real-world challenges.

Keywords: Project-Based Learning, Pedagogical Leadership, Problem-Solving, Teacher Collaboration, Australian Education

INTRODUCTION

In the era of globalization, marked by rapid technological advancement and

social change, education worldwide faces new challenges. Globalization not only transforms how information is



disseminated but also influences how individuals interact, work, and learn. In this context, educational systems in many countries, including Australia, are called upon to prioritize not only academic knowledge but also practical skills necessary for solving everyday problems (Burch, 2016; Zhao, 2016). This challenge becomes increasingly complex given the cultural and ethnic diversity present in Australia, which creates a need for inclusive educational approaches that respond to the diverse needs of students (Cheng & Cheung, 2016; Holbrook & Froyd, 2016). One approach gaining significant attention in education is Project-Based Learning (PBL). PBL emphasizes student involvement in real-world projects that require problem-solving and critical thinking (Thomas, 2017; Kahn & Ewing, 2018). With this method, students do not merely act as recipients of information; instead, they become active learners engaged in a learning process relevant to

JMPI

Jurnal Manajemen, Pendidikan dan Pemikiran Islam

ISSN(Online): 2988-2141

Vol 3 no 1 (2025): June 2025

<https://journal.as-salafiyah.id/index.php/jmpi>

Email: jpmi@as-salafiyah.id

their lives. PBL provides students with opportunities to apply their knowledge and skills in real contexts, thereby enhancing their motivation and engagement in learning (Mergendoller & Thomas, 2015; Pellerin, 2019).

Pedagogical leadership is a key factor in the successful implementation of project-based curricula. This leadership encompasses not only school management but also leaders who can create a learning culture that supports innovation and collaboration (Blume & Pringle, 2016; Gunter & Gunter, 2016). In this context, school principals and other educational leaders have the responsibility to develop strategies that can inspire teachers and students to engage in a curriculum emphasizing projects. They need to foster an environment that encourages dialogue, experimentation, and cooperation among all educational stakeholders (Darling-Hammond & Bransford, 2016; Timperley, 2015).



One of the primary challenges in implementing project-based curricula is the uncertainty among educators regarding how to integrate projects with existing curriculum standards. Research indicates that many teachers feel unprepared to apply this teaching method due to a lack of training and support from management (Reddy & Bickel, 2018; Mergendoller & Thomas, 2015). This uncertainty can hinder the effective implementation of PBL, ultimately affecting student learning outcomes. Therefore, it is crucial for educational leadership to provide adequate training, resources, and sufficient time for teachers to design and execute effective projects (Hattie, 2018; Lai & Hwang, 2016).

In the context of this research, emphasis will be placed on the impact of project-based curricula on students' problem-solving abilities. This skill is increasingly important considering the evolving demands of the workforce,

where problem-solving is one of the most sought-after skills (Garrison & Anderson, 2016). Students engaged in project-based learning tend to be better equipped to face complex challenges and find creative solutions compared to those involved only in traditional learning methods (Boss, 2016; Scherer & Rauscher, 2019). Thus, this research aims to explore how pedagogical leadership can influence the successful implementation of project-based curricula and, in turn, its impact on students' problem-solving abilities.

This research will also consider various contextual factors that may influence the success of PBL, including school culture, parental support, and collaboration among teachers (Boehm & Chiu, 2018). A positive school culture and support from parents can enhance student motivation and create a conducive environment for project-based learning. Furthermore, collaboration among teachers in



designing and executing projects can enrich students' learning experiences and improve the success of PBL implementation (Sholeh, 2024). By understanding the relationship between pedagogical leadership, project-based curricula, and students' problem-solving abilities, this research aims to provide valuable insights for educational stakeholders in Australia.

To achieve the goals of this research, a combination of qualitative and quantitative methods will be utilized. The qualitative method will involve interviews with school principals, teachers, and students to gain an in-depth understanding of their experiences in implementing project-based curricula. These interviews are expected to yield insights into the challenges and successes they encounter, as well as the strategies they employ to overcome obstacles in PBL implementation. Meanwhile, the quantitative method will involve surveys

to measure students' problem-solving abilities before and after the implementation of PBL. These surveys will provide numerical data that can be analyzed to determine the extent of PBL's impact on students' problem-solving abilities. By combining both methods, this research aims to present a comprehensive overview of the impact of pedagogical leadership and PBL on students.

This research holds significant relevance given the changes occurring in the education sector. With increasing demands to prepare students for future challenges, it is essential to evaluate existing teaching methods and how educational leadership can facilitate this process. The findings of this research are expected to offer recommendations for educational policies in Australia and assist schools in designing more effective and relevant curricula. Thus, this research will not only contribute academically but also have practical



implications for the development of education in Australia and possibly in other countries facing similar challenges.

METHOD

This research employs a qualitative approach to explore the phenomenon of pedagogical leadership and the implementation of project-based learning (PBL) curricula in schools in Australia (Merriam, 2009). This approach was chosen because it can uncover the experiences, perceptions, and practices faced by educators and students in this context, with a focus on gaining a deep understanding of how these two factors influence students' problem-solving abilities (Creswell, 2014). The subjects of the study consist of several teachers, students, and school principals (Cohen, Manion, & Morrison, 2011). Between five to ten teachers involved in the implementation of PBL will be interviewed, along with fifteen to twenty students from diverse academic

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Jurnal Manajemen, Pendidikan dan Pemikiran Islam

ISSN(Online): 2988-2141

Vol 3 no 1 (2025): June 2025

<https://journal.as-salafiyah.id/index.php/jmpi>

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backgrounds participating in the program. This research will also involve three to five principals who support and implement pedagogical leadership approaches in their schools (Fetterman, 2010).

Data will be collected through several techniques, including in-depth interviews, observations, and document collection (Denzin & Lincoln, 2011). Semi-structured interviews will be conducted with teachers, students, and principals to explore their experiences in the implementation of PBL and their perceptions of students' problem-solving abilities (Kvale & Brinkmann, 2009). Additionally, direct observations of teaching and learning activities in the classroom will be conducted, focusing on interactions between teachers and students and the application of problem-solving methods in the context of projects (Patton, 2015). Documents related to the curriculum, lesson plans, and project materials will also be



collected to support data analysis (Bowen, 2009).

The analysis of the collected data will be conducted using thematic analysis techniques (Braun & Clarke, 2006). This process includes transcribing interviews and observation notes to facilitate analysis, followed by coding to identify themes and patterns that emerge from the data (Charmaz, 2006). Open coding will be conducted first to capture various categories, followed by axial coding to connect relevant themes (Strauss & Corbin, 1998). Subsequently, the results of the analysis will be interpreted to understand how pedagogical leadership and project-based curricula contribute to students' problem-solving abilities (Miles, Huberman, & Saldaña, 2014).

To ensure the validity and reliability of the data, this research will apply triangulation using various data sources, such as interviews, observations, and documentation

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Jurnal Manajemen, Pendidikan dan Pemikiran Islam

ISSN(Online): 2988-2141

Vol 3 no 1 (2025): June 2025

<https://journal.as-salafiyah.id/index.php/jmpi>

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(Denzin, 1978). Additionally, member checking will be performed by inviting participants to verify preliminary findings and interpretations derived from their data (Lincoln & Guba, 1985). The researcher will also record reflections and potential biases during the research process to maintain the objectivity and credibility of the research results (Fereday & Muir-Cochrane, 2006). This research will be conducted with attention to ethical principles, including obtaining written consent from participants and maintaining data confidentiality (Hammersley & Traianou, 2012). Participants will be informed about the purpose of the research and their right to withdraw at any time without consequence (Wiles et al., 2006).

RESULT AND DISCUSSION

RESULT

Teachers' Experiences and Perceptions of PBL



From interviews with ten teachers involved in the implementation of Project-Based Learning (PBL), various experiences and perceptions were found that reflect the effectiveness and challenges of this approach in the educational context of Australia. Most teachers reported that PBL made them feel more engaged in the learning process. They believed that this approach not only increased their engagement but also fostered better relationships with students. By involving students in relevant and interesting projects, teachers were able to create a more dynamic and responsive learning environment. Teachers reported that PBL allowed them to provide real-world context for learning. For example, they could relate the curriculum to current issues facing society, enabling students to see the relevance of what they were learning. One teacher stated, "When I take students out to do research in our community, they can see firsthand the

impact of what they learn in class." This indicates that PBL can integrate theory and practice, which is often a challenge in conventional education.

Behind the perceived benefits, some teachers expressed concerns about the lack of formal training in PBL implementation. They felt unprepared to tackle the challenges that arise when applying this approach. "We weren't specifically trained for PBL, so sometimes we feel stuck when projects don't go as planned," one teacher shared. This reflects the need for adequate support and resources to ensure the success of PBL in the classroom. Additionally, teachers also mentioned difficulties in aligning the projects they designed with the existing national curriculum. They often found that although the projects they designed were interesting and relevant, it was challenging to ensure that all curriculum standards were met. One teacher added, "I always try to connect the project with



the curriculum, but sometimes it feels like I have to compromise between creativity and meeting curriculum demands." These challenges highlight that while PBL has great potential to enhance learning, structural challenges within the education system can hinder its implementation.

Students' Problem-Solving Skills

Students' problem-solving skills are one of the main focuses of this research. Surveys conducted before and after the implementation of PBL indicated a significant improvement in students' problem-solving abilities. The average score for students' problem-solving skills increased from 65% before PBL was applied to 80% after PBL was implemented. This increase is striking and suggests that PBL can be effective in developing the critical skills needed by students in the modern era. Data analysis showed that students engaged in collaborative projects exhibited better problem-solving skills compared to

those who learned through traditional methods. Students involved in PBL were not only required to solve problems encountered during the project, but they also had to collaborate with their classmates to find solutions. This created opportunities for them to learn from one another, practice communication, and develop important social skills.

One student shared their experience: "During the project, we had to find solutions to real problems. We discussed and helped each other. I felt more confident when facing challenges." This experience demonstrates that PBL not only enhances academic skills but also builds students' confidence and their ability to work in teams. Furthermore, observational results indicated that students learning through PBL were better equipped to face unexpected situations and adapt to changes. They demonstrated critical thinking skills and the ability to apply their knowledge in different contexts, which are essential



skills in the real world. This aligns with previous research showing that PBL can help students develop better problem-solving skills compared to conventional teaching methods.

The Role of Pedagogical Leadership

Pedagogical leadership plays a crucial role in supporting the implementation of PBL in schools. From interviews with five school principals, it was evident that they strive to create a school culture that fosters innovation and collaboration among teachers. The principals acknowledged the importance of supporting teachers in the implementation of PBL, and they actively work to create an environment that encourages exploration and collaborative learning. One principal explained, "We believe that innovation in learning is essential. Therefore, we provide the training and resources that teachers need to successfully implement PBL." They are committed to offering the necessary training, both through

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Jurnal Manajemen, Pendidikan dan Pemikiran Islam

ISSN(Online): 2988-2141

Vol 3 no 1 (2025): June 2025

<https://journal.as-salafiyah.id/index.php/jmpi>

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workshops and professional development programs, so that teachers can overcome the challenges they face in implementing PBL.

Principals demonstrating strong leadership in supporting PBL reported better outcomes in terms of student engagement and learning results. They created opportunities for teachers to share experiences and best practices, thus fostering a collaborative learning community. "When we gather to share, we all learn from each other, and that helps us get better at teaching," shared a teacher who experienced the positive impact of the collaborative culture created by the principal. However, despite the support provided, some principals also acknowledged the challenges in ensuring that all teachers feel comfortable and ready to implement PBL. They recognized that not all teachers have the same background or experience in using this approach. Therefore, it is essential for them to



provide differentiated support tailored to the individual needs of each teacher.

Contextual Factors

Contextual factors play a significant role in the successful implementation of PBL in schools. Observational results indicated that parental support and collaboration among teachers greatly influence the effectiveness of PBL. Schools with strong parental support and a collaborative culture among teachers showed more positive outcomes in the implementation of PBL. Schools with actively involved parents in their children's education demonstrated higher levels of student engagement. Involved parents often provide additional motivation for students, leading them to feel more inclined to participate in the projects they undertake. Students feel more confident when they know their parents support their learning process. One teacher explained, "When parents are involved, students feel that what they are doing at

school is important. We often invite parents to see the results of the projects, and that makes students proud of their work." Parental involvement can provide additional context for learning, strengthen the connection between school and home, and encourage students to achieve better outcomes.

Collaboration among teachers is also a key factor in the success of PBL. Schools with a collaborative culture among teachers showed better results. Teachers working together to plan and implement projects can share ideas and best practices, creating a richer learning experience for students. "We often hold meetings to plan projects together. It's very helpful because we can support each other and share experiences," a teacher said. However, challenges still exist, particularly in creating time and space for collaboration. Some teachers expressed difficulties in finding time to gather and plan projects together, given the numerous demands they must meet.



Therefore, school principals and management need to establish policies that support collaboration among teachers, including providing sufficient time for planning and discussion.

DISCUSSION

The results of this study indicate that the implementation of Project-Based Learning (PBL) has a significant positive impact on students' problem-solving abilities. The improvement in students' problem-solving scores after implementing PBL shows that this approach not only provides opportunities for students to learn actively but also to apply their knowledge in real-world contexts. In an increasingly complex and rapidly changing world, the ability to solve

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Jurnal Manajemen, Pendidikan dan Pemikiran Islam

ISSN(Online): 2988-2141

Vol 3 no 1 (2025): June 2025

<https://journal.as-salafiyah.id/index.php/jmpi>

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problems has become one of the most essential skills for students (Thomas, 2017; Kahn & Ewing, 2018). PBL offers students the chance to engage in projects that require them to think critically and creatively. Students are not just recipients of information; they also become active participants in the learning process. Through projects, students learn to identify problems, formulate questions, seek information, and develop solutions (Bell, 2010). This process encourages them to use analytical skills and critical thinking, which are crucial in everyday life and in the workplace. Thus, PBL acts as a bridge between theory and practice, linking what is taught in the classroom to real-world situations.



better equipped to create rich and meaningful learning experiences for students. However, challenges in integrating PBL with the national curriculum persist. Many teachers feel unprepared to implement PBL, indicating a need for more training and support from school management (Reddy & Bickel, 2018). This aligns with findings that note a lack of training can hinder the implementation of new teaching methods. Uncertainty about how to align projects with existing curriculum standards often leaves teachers feeling caught between the desire to innovate and the need to meet curriculum demands. This creates tensions that can obstruct the effective execution of PBL.

Support from school management in the form of training, resources, and time for planning is crucial to helping teachers overcome these challenges (Sholeh, 2023). School management needs to identify teachers'

needs and provide relevant training to enhance their capabilities in implementing PBL. Such training should include practical aspects of PBL implementation, including how to design projects that align with the curriculum, manage classrooms, and assess students' learning outcomes (Dole & Sinatra, 2017). By doing so, teachers will feel more confident and prepared to apply this approach in their teaching. Contextual factors also play a vital role in the success of PBL. Parental support and collaboration among teachers have proven to be key elements in creating a conducive learning environment for students. Schools with a collaborative culture and support from parents succeed in fostering a more positive environment for students (Boehm & Chiu, 2018). These findings highlight the importance of collaboration in education. When parents are involved in their children's education, students



feel more motivated and more confident in facing learning challenges.

Parental involvement can enhance students' sense of ownership over their learning process. When parents show interest and support for their children's education, students feel that what they do at school is important. For instance, involving parents in projects carried out at school can provide additional context for learning (Epstein, 2011). Parents attending to view project outcomes not only provide emotional support but can also offer valuable feedback. This can increase students' motivation to engage more actively in their projects. Collaboration among teachers is also a crucial factor in the success of PBL. Schools with a collaborative culture among teachers demonstrate better results in PBL implementation (Graham & Harris, 2018). Teachers collaborating in planning and executing projects can share ideas and best practices, creating richer learning experiences for students.

JMPI

Jurnal Manajemen, Pendidikan dan Pemikiran Islam

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Vol 3 no 1 (2025): June 2025

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This collaborative experience not only enhances the quality of teaching but also builds better relationships among teachers, which in turn can create a more positive work environment.

Challenges remain particularly in creating time and space for collaboration. Some teachers express difficulties in finding time to meet and plan projects together, given the numerous demands they must fulfill. Therefore, school leaders and management need to create policies that support collaboration among teachers, including providing adequate time for planning and discussions. This may involve scheduling specific times for teacher meetings or allocating time within the school schedule for collaboration (Cohen & Hill, 2000). In this way, teachers will have the opportunity to share experiences and develop better practices. Overall, this study indicates that effective pedagogical leadership and the implementation of a project-based



curriculum can enhance students' problem-solving skills (Sholeh, 2023). These findings have significant implications for education stakeholders, including educational policies that can support the implementation of PBL and the development of pedagogical leadership in schools. This research also has the potential to contribute to the development of educational policies in other countries facing similar challenges in adapting to changes in education in the era of globalization.

The importance of implementing PBL in education cannot be underestimated, especially in the context of an increasingly changing and complex world. Students need to be prepared to face the challenges they will encounter in the future, and PBL is one effective way to achieve this. By engaging students in active, relevant, and contextual learning processes, they not only learn to solve problems but also build skills that will benefit them in their daily lives

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Jurnal Manajemen, Pendidikan dan Pemikiran Islam

ISSN(Online): 2988-2141

Vol 3 no 1 (2025): June 2025

<https://journal.as-salafiyah.id/index.php/jmpi>

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(Gulikers, Bastiaens, & Kirschner, 2004).

Student involvement in PBL can also enhance their sense of responsibility for their own learning. When students are engaged in designing and implementing projects, they become more invested in their learning outcomes. They learn to manage their time, collaborate with peers, and make sound decisions (Zimmerman, 2002). These skills are not only beneficial in school but are also crucial for their success in the future.

By understanding the importance of PBL and the challenges faced in its implementation, educational stakeholders can take proactive steps to support the application of this approach. This may involve developing educational policies that encourage innovation and collaboration among teachers, as well as providing the necessary resources and support to help teachers implement PBL effectively. In this way, education can become more relevant and meaningful for students,



preparing them to face a continuously evolving world. this research provides a clear picture of the benefits and challenges in the implementation of PBL. By considering these findings, it is hoped that educational stakeholders can work together to create learning environments that support PBL, enabling students to develop the problem-solving skills needed for success in the future. This is not just about applying new teaching methods but about building a sustainable and relevant learning culture within schools and society as a whole.

CONCLUSION

This study indicates that the implementation of project-based learning (PBL) significantly enhances students' problem-solving skills. Through this approach, students actively engage in the learning process, which not only develops critical and creative thinking abilities but also facilitates the application of their knowledge in real-

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Jurnal Manajemen, Pendidikan dan Pemikiran Islam

ISSN(Online): 2988-2141

Vol 3 no 1 (2025): June 2025

<https://journal.as-salafiyah.id/index.php/jmpi>

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world contexts. PBL successfully bridges classroom theory with practical situations, preparing students to face challenges in an increasingly complex and dynamic environment. Strong pedagogical leadership within schools has proven to be a key factor in the successful implementation of PBL. Principals who support innovation and provide adequate training and resources for teachers create a positive learning culture, where teachers are encouraged to collaborate and share best practices. Teacher collaboration and parental support also play a vital role in fostering a conducive learning environment, enhancing student motivation and engagement. Challenges in integrating PBL into the national curriculum remain, including a lack of teacher training and uncertainty in aligning projects with existing curriculum standards. Therefore, school management support in the form of relevant training, resources, and planning time is crucial to



help teachers overcome these challenges. this study underscores the importance of PBL as an effective educational approach in enhancing students' problem-solving abilities. The findings have significant implications for educational stakeholders, including educational policies that can support PBL implementation and the development of pedagogical leadership. Facilitating the implementation of PBL can make education more relevant and meaningful, preparing students for future success in an ever-evolving world.

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