

# The Project Method in Early Childhood Education and its scientific production: a systematic review

El Método de Proyectos en Educación Infantil y su producción científica: una revisión sistemática

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# The Project Method in Early Childhood Education and its scientific production: a systematic review

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## Abstract

The Project Approach (PBL) has emerged as a key pedagogical strategy in Early Childhood Education. This article conducts a systematic review of 31 selected studies to analyze the trajectory and current state of PBL research in Spain, published between 2020 and 2024. Using the PRISMA methodology, relevant research extracted from academic databases indexed in JCR such as ERIC, Google Scholar, Dialnet, Redalyc and Scielo were identified, selected and synthesized. The findings reflect a sustained increase in the application of PBL in Early Childhood Education, highlighting its positive impact on the development of key competencies such as creativity, critical thinking and teamwork. In addition, a diversity in the implementation of PBL is observed, including interdisciplinary and technological approaches, which evidences its potential to improve educational practice in different contexts and scenarios.

**Key words:** projects, project method, early childhood education, systematic review, PRISMA methodology.

## Resumen

El Método de Proyectos (ABP) ha emergido como una estrategia pedagógica clave en la Educación Infantil. Este artículo realiza una revisión sistemática de 31 estudios seleccionados para analizar la trayectoria y el estado actual de la investigación sobre el ABP en España, publicados entre 2020 y 2024. Utilizando la metodología PRISMA, se identificaron, seleccionaron y sintetizaron investigaciones relevantes extraídas de bases de datos académicas indexadas en JCR como ERIC, Google Scholar, Dialnet, Redalyc y Scielo. Los hallazgos reflejan un aumento sostenido en la aplicación del ABP en Educación Infantil, subrayando su impacto positivo en el desarrollo de competencias clave como la creatividad, el pensamiento crítico y el trabajo en equipo. Además, se observa una diversidad en la implementación del ABP, incluyendo enfoques interdisciplinarios y tecnológicos, lo que evidencia su potencial para mejorar la práctica educativa en distintos contextos y escenarios.

**Palabras clave:** proyectos, método de proyectos, educación infantil, revisión sistemática, metodología PRISMA.

# 1. Introduction

The Project Method, better known as Project Learning (PBL hereafter), has gained special relevance in Early Childhood Education as an effective pedagogical methodology to foster active, collaborative, and contextualized learning (Martínez Hernando, 2021; Botella & Ramos, 2019; Bell, 2010). This pedagogical approach is characterized by placing students at the center of the educational process, allowing them to assume an active role that facilitates the acquisition of key competencies, such as creativity, critical thinking, and problem-solving (Osorio Pérez, 2024; Lucenko et al., 2023). The purpose of PBL in this context is to connect learning with students' interests and experiences, achieving more profound and meaningful learning (Muzás & Blanchard, 2020; Blumenfeld et al., 1991). Likewise, the Project Approach not only develops academic competencies but also has the potential to positively influence emotional competencies, in line with what is pointed out by García Andrade (2019), who highlights the importance of linking emotional neuroscience with individual development in educational contexts.

The origin of the Project Method can be found in the pedagogical theories of John Dewey (1938), who emphasized the importance of experiential learning based on interaction with the environment. Over the years, this methodology has been adapted to current educational needs, finding a particularly suitable space for its implementation in Early Childhood Education. At this educational level, PBL fosters academic competencies and social and emotional skills that are fundamental for comprehensive development from an early age, preparing students to face future challenges (Cascales et al., 2020; Clark, 2006). Incorporating educational technologies in PBL is another outstanding aspect, as it opens new possibilities for interactive and collaborative learning, promoting the development of digital competencies from the early years (Wulandani et al., 2022; Cascales et al., 2017). On the other hand, the investigated approach has been consolidated as a flexible and applicable pedagogical method at

various educational levels, from Early Childhood Education to university, as demonstrated by Díaz Tenza (2020) in his practical and applied analysis, where he highlights the potential of PBL to connect learning with real and meaningful contexts (Aljabreen, 2020; Díaz, 2020).

Despite the apparent benefits, PBL in Early Childhood Education has been less researched than in higher educational stages (Kokotsaki et al., 2016). The existing literature on PBL has mainly focused on primary and secondary education, leaving a significant lack of empirical studies on its impact on early childhood education. Despite the rise of PBL at higher educational levels, research on its impact on Early Childhood Education remains limited (Fernández-Cruz & Fernández-Díaz, 2016; Sánchez Garrido, 2021). This gap limits the ability of teachers and educational leaders to make informed decisions about the integration of this methodology in the early years of schooling, a critical period for the development of cognitive and socioemotional competencies (Arantes-Do Amaral, 2021; Jane, 1998).

The need for a systematic review of the Project Approach in Early Childhood Education is urgent, as this methodology can foster deep learning during a crucial stage of child development (Holm, 2011; Sarceda et al., 2016; Condliffe, 2017). The lack of specific scientific evidence raises questions about how this absence may hinder pedagogical innovation and limit educational equity, especially in rural or disadvantaged contexts (Torrego & Martínez, 2018; Ruiz & Ortega-Sánchez, 2022).

The main objective of the present study is to fill this research gap through a systematic review of the literature on PBL in Early Childhood Education in Spain, published between 2020 and 2024. Based on the studies collected using the PRISMA methodology for its acronym in English, Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA hereafter), it seeks to analyze the current state of research in this field, identify good practices, areas of

opportunity, and systematize the available scientific evidence (Kołodziejcki & Przybysz-Zaremba, 2017). This review will offer practical guidance for researchers and teachers, providing

a solid foundation for implementing PBL in Early Childhood Education and promoting its effective incorporation in classrooms (Hutton et al., 2015).

## 2. Materials and methodology

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To ensure the replicability of the present study, a systematic review was designed following the PRISMA protocol, a methodology recognized for its rigor in structuring and transparency of the identification, selection, evaluation, and synthesis of the scientific literature (Moher et al., 2009). PRISMA allows reviews to be organized in four well-defined stages: identification, selection, eligibility, and inclusion. This approach facilitates not only the repetition of the study but also the comparison of results and updating the review in future research.

### 2.1. Methodological design of the investigation

The systematic review was structured according to the four phases established in PRISMA. First, an exhaustive search was conducted in academic databases indexed in JCR, such as ERIC, Google Scholar, Dialnet, Redalyc, and Scielo. These sources were selected for their reputation for indexing high-quality educational research nationally and internationally. To optimize the search, key terms in Spanish and English were used, such as “Project Method,” “Project-Based Learning,” “Project-Based Learning,” and “Project Method.” Combining these terms with Boolean operators (AND, OR, NOT) made it possible to reduce the risk of obtaining irrelevant results, especially from studies focused on educational stages other than Early Childhood Education. To ensure the quality of the selected sources, Journal Citation Reports (JCR) was used exclusively to identify high-impact journals in education. However, the articles analyzed in this

review were extracted from recognized databases such as ERIC, Google Scholar, Dialnet, Redalyc, and Scielo, ensuring a broad and diverse coverage of studies on Project Learning in Early Childhood Education.

The search was then restricted to publications between 2020 and 2024, with filters for language (Spanish and English) and type of study (excluding theoretical reviews and conferences without empirical data). In addition, open access was established as a priority criterion to facilitate the consultation of the studies. To guarantee the exhaustiveness of the process, a search strategy was designed with the equation: (‘Project-Based Learning’ OR ‘Project Method’ OR ‘Project-Based Learning’) AND (‘Early Childhood Education’ OR ‘Early Childhood Education’). This search was performed on titles, abstracts, and keywords in the selected databases, using Boolean operators to maximize the inclusion of relevant studies. Zotero software was used to manage bibliographic references and ensure the rigorous organization of the selected studies, allowing the creation of a structured database and accurate citation management (Hutton et al., 2015).

Therefore, of the 130 studies initially identified, the inclusion and exclusion criteria were applied to filter out those that really met the study’s objective. Only empirical research in Early Childhood Education was considered, excluding studies on higher levels, and studies with proven methodological rigor were prioritized.

Table 1: Inclusion and Exclusion Criteria. .  
Source: Author (2025).

Inclusion Criteria	Exclusion Criteria
Scientific studies with qualitative and quantitative designs;	Studies that do not correspond to the field of education;
Scientific articles;	Non-empirical studies such as essays or conferences;
Academic work (TFG, TFM, doctoral thesis);	Articles or studies published before 2020;
Year of publication between 2020 and 2024;	Studies published in languages other than Spanish and English;
Available in English and Spanish;	
Open and complete access;	Studies on educational levels other than Early Childhood Education;
Studies focused on PBL in Early Childhood Education.	

On the other hand, the article selection process is explained below. Table 2 presents a detailed breakdown of the article selection phases, which began with the identification of 130 studies and culminated in the inclusion of 31 final studies. This table highlights the exclusion criteria applied

in each phase, which ensured that the selected studies provided significant empirical evidence on the implementation of PBL in Early Childhood Education. This process confirms the alignment of the selected studies with the research objectives.

Table 2: Article selection process  
Source: Author (2025).

Stage of the prcess	Number of studies	Criteria applied
Initial identification	130	- Exhaustive search in databases: ERIC, Google Scholar, Dialnet, Redalyc, Scielo. - Search terms in English and Spanish: Método de Proyectos, ABP, Project-Based Learning, Project Method, etc.
Review of titles and abstracts	60	- Exclusion of studies not focused on Early Childhood Education. - Elimination of non-empirical studies (essays, theoretical reviews, conferences). - Filtering of studies outside the 2020-2024 range. - Language (Spanish or English).
Complete revision of texts	40	- Complete reading to ensure thematic relevance. - Evaluation of the clarity of the objectives. - Verification of methodological quality (data collection and analysis, representativeness of the sample, validity).
Final selection of relevant studies	31	- Prioritization of studies with methodological rigor. - Inclusion of studies with methodological diversity (qualitative, quantitative, mixed). - Focus on studies that provide innovations or solid evidence on PBL in Early Childhood Education.



## 2.2. Study population and sample

The review focused on studies conducted in the Spanish educational context between 2020 and 2024. The final sample, consisting of 31 empirical investigations, includes qualitative, quantitative, and mixed studies. Although this number could be considered limited, it responds to the need for a detailed and methodologically rigorous analysis of the use of the Project Method in early childhood. This selection allows us to observe methodological trends, types of results, and implementation approaches in the field of PBL in early childhood education, thus providing an adequate and meaningful representation of the state of current research (Ruiz & Ortega-Sánchez, 2022). Although the number of studies included (n=31) may seem limited, it responds to the need for methodologically rigorous analysis, selecting only empirical research with proven and contextualized quality criteria. Similar studies have used comparable sample sizes for systematic

educational reviews (Condliffe, 2017; Kokotsaki et al., 2016).

## 2.3. Coding of variables and data analysis

The studies were coded according to variables relevant to the comparative analysis:

1. Variables extrinsic to the scientific process: The name of the journal, the year of publication, and the academic institution associated with each study were recorded.
2. Methodological variables: These included the type of methodological design, data collection strategies (interviews, surveys, observations), and sample size.
3. Variables about the participants, Such as educational stage and implementation context.
4. Variables related to PBL: Aspects such as key competencies studied, technological integration, and the projects' interdisciplinary approach.

**Tabla 3:** Variables for coding studies.  
Source: Author (2025).

Category	Variable	Description
Variables extrinsic to the scientific process	Magazine publication	Name of the journal or source in which the study was published
	Year of publication	Year in which the study was published
	Scientific or university institution	Affiliated institution of the authors or of the academic center where the research was conducted
Methodological variables	Type of design	Methodological design used in the study (qualitative, quantitative or mixed).
	Data collection strategy	Methods used for data collection (interviews, surveys, observations, etc.)
	Sample size	Number of participants or data analyzed in each study
Variables on participants	Educational stage attended	Educational level of students participating in the studies
Variables related to PBA	Educational stage to be attended	Stage or cycle of Early Childhood Education studied (first cycle or second cycle)
	Aspect studied	Specific components of PBL analyzed (key competencies, social-emotional impact, etc.)

The data analysis was based on a narrative synthesis of the main findings and a comparative analysis of patterns in the implementation of PBL

in different educational contexts. To ensure the validity of the results, each study was evaluated according to the established methodological

quality, following criteria such as clarity in the objectives and rigor in the data analysis (Ruiz & Ortega-Sánchez, 2022).

2.4. Statistical analysis

Although the main focus of this review was qualitative, a descriptive analysis was performed to categorize and graphically represent the trends observed in the selected studies. This integration of qualitative and quantitative analysis provides a comprehensive and detailed overview of the

impact of PBL in Early Childhood Education. It facilitates the interpretation of the results based on the different methodological approaches employed in the sample (Cascales & Carrillo-García, 2018). With this methodology, the study seeks to offer a replicable and transparent analysis of the current state of research on PBL in Early Childhood Education, providing a solid empirical basis that can serve as a guide for future studies and for the implementation of PBL in the classroom.

3. Results

The analysis of the results was structured according to the data extracted from the 31 selected studies, thus complying with the inclusion criteria established in the methodology. The main

findings are presented below, organized into key categories, and accompanied by representative tables summarizing the most relevant data for the study.

**Table 4.** Previous search in the databases (search words in EN and ES). **Source:** author’s own elaboration based on data obtained from the database available in ERIC, Google Scholar, Dialnet, Redalyc and Scielo. **Source:** Author (2025).

Keywords	Database					
	ERIC	Google Scholar	Redalyc	Scielo	Dialnet	Total
Project Method in Early Childhood Education	2	2	1	1	2	8
PBL in Early Childhood Education	3	5	2	2	4	16
Project Work in Early Childhood Education	2	2	1	1	1	7
Project-based learning in Early Childhood Education	3	3	1	1	1	9
Project Method in Early Childhood	6	8	3	4	3	24
Project-Based Learning in Early Childhood	7	8	3	4	7	29
Project-Based Learning in Infant Education	3	4	1	2	1	11
Project Work in Kindergarten	2	3	2	2	1	10

Keywords	Database					
	ERIC	Google Scholar	Redalyc	Scielo	Dialnet	Total
<i>Task-Based Learning in Early Childhood</i>	2	2	0	1	2	7
<i>Learning through Projects in Infant Education</i>	1	3	1	1	1	7
Total	24	40	13	17	19	130

Table 4 shows the distribution of the studies identified in each database according to the keywords used in Spanish and English. This process resulted in a total of 130 initial studies, of which only 31 met the inclusion and methodological quality criteria to form part of the final analysis. The databases used included ERIC, Google Scholar, Dialnet, Redalyc and Scielo. This search and filtering phase allowed us to ensure the relevance and specific focus on Early Childhood Education within Project Based Learning.

On the other hand, the article selection process is explained below. Table 4 presents a detailed breakdown of the article selection phases, which began with the identification of 130 studies and culminated in the inclusion of 31 final studies. This table highlights the exclusion criteria applied in each phase, which ensured that the selected studies provided significant empirical evidence on the implementation of PBL in Early Childhood Education. This process confirms the alignment of the selected studies with the research objectives.

**Tabla 5:** Article selection process.  
Source: Author (2025).

Stage of the process	Number of studies	Criteria applied
Initial identification	130	<ul style="list-style-type: none"> <li>- Exhaustive search in databases: ERIC, Google Scholar, Dialnet, Redalyc, Scielo.</li> <li>- Search terms in English and Spanish: Método de Proyectos, ABP, Project-Based Learning, Project Method, etc.</li> </ul>
Review of titles and abstracts	60	<ul style="list-style-type: none"> <li>- Exclusion of studies not focused on Early Childhood Education.</li> <li>- Elimination of non-empirical studies (essays, theoretical reviews, conferences).</li> <li>- Filtering of studies outside the 2020-2024 range.</li> <li>- Language (Spanish or English).</li> </ul>
Complete revision of texts	40	<ul style="list-style-type: none"> <li>- Complete reading to ensure thematic relevance.</li> <li>- Evaluation of the clarity of the objectives.</li> <li>- Verification of methodological quality (data collection and analysis, representativeness of the sample, validity).</li> </ul>
Final selection of relevant studies	31	<ul style="list-style-type: none"> <li>- Prioritization of studies with methodological rigor.</li> <li>- Inclusion of studies with methodological diversity (qualitative, quantitative, mixed).</li> <li>- Focus on studies that provide innovations or solid evidence on PBL in Early Childhood Education.</li> </ul>

According to the data analyzed, 53.12% of the studies were concentrated in five key academic journals, such as Early Childhood Education Journal and Scielo, indicating a growing interest

in specialized journals within the educational field (Table 5). This publication pattern reflects both the relevance of the Project Approach in the current educational context and the potential



challenge of accessibility to these studies for classroom teachers, who could benefit from greater dissemination of these findings in open access media.

Table 6: Relationship between journals and number of articles published. Author (2025)

Magazine	Number of items	Percentage
Early Childhood Education Journal	4	12,5%
Scielo	4	12,5%
Dialnet	4	12,5%
Redalyc	3	9,38%
Academia.edu	2	6,25%
Otras publicaciones	15	46,88%

Table 6 illustrates the increase of PBL studies in Early Childhood Education in the post-pandemic period (2021-2023). This significant increase can be attributed to the need for adaptation methodological adaptation of educational institutions during the COVID-19 pandemic, which favored the implementation of flexible pedagogical approaches such as PBL (Feyen, 2020; Rocha, 2020; Santillán-Aguirre et al., 2023). Recent research suggests that the

health crisis accelerated the adoption of active methodologies, such as PBL, to foster autonomy and project-based learning in hybrid environments (De Santiago, 2020; Engel & Coll, 2022; Suárez et al., 2023; Orozco et al., 2023, Posso, 2023). Most of the selected studies were published in 2023, suggesting a consolidated interest in this methodology as a response to new educational demands (Hira & Anderson, 2021).

Table 7: Relationship between year of publication and number of articles published. A  
Source: Author (2025).

Year of publication	Number of items	Percentage
2020	5	16,13%
2021	7	22,58%
2022	6	19,35%
2023	10	32,26%
2024	3	9,68%

The methodological distribution of the studies shows a predominance of qualitative approaches, representing 53.13% of the studies analyzed, while 28.13% correspond to quantitative studies and 18.75% to mixed studies (Table 8). This preference for qualitative methods reflects an interest in exploring teachers’ and students’

experiences and perceptions of PBL in the classroom, although it also points to a need for additional quantitative evidence assessing the impact of PBL on academic achievement and the development of key competencies in Early Childhood Education students (Chen & Yang, 2019).

**Table 8:** Predominant study methodology.  
Source: Author (2025).

Methodology used	Percentage	Number of studies
Qualitative studies	53,13%	17 studies
Quantitative studies	28,13%	9 studies
Mixed studies	18,75%	5 studies

The 31 selected studies reflect a diverse panorama of methodological approaches and applications of Project Based Learning in Early Childhood Education. A trend toward the use of PBL to foster autonomy and active participation of children in their learning process was identified (Apaza Canada et al., 2022). Likewise, the relationship of the Project Method with the improvement in academic performance and the development of socioemotional skills in the first years of schooling has been pointed out (Barrera Arcaya et al., 2022).

The results show that PBL contributes significantly to the development of fundamental competencies such as creativity, critical thinking, and teamwork (Lucenko et al., 2023). In addition, increasing use of technology in Early Childhood Education was observed in PBL, especially in approaches related to the Science, Technology, Engineering, Arts, and Mathematics (STEAM) concept, reflecting an interest in the integration of digital tools as a complement in Early Childhood Education (Wulandani et al., 2022). These findings suggest that the incorporation of technology in PBL facilitates more interactive and contextualized learning (63% of the articles relate PBL and technology), which is particularly relevant in a post-pandemic context, where hybrid

and remote learning has gained prominence (Hira & Anderson, 2021; Cascales et al., 2017).

Regarding the implementation of PBL in specific educational contexts, the reviewed studies highlight its potential to foster inclusion and reduce educational inequalities in rural or disadvantaged contexts, where PBL can improve access to enriching and personalized learning experiences (Beneke & Ostrosky, 2009; Irure & Belletich, 2015; Clavijo et al., 2016; Barrera Arcaya et al., 2022). However, the lack of specific studies in these settings suggests an opportunity for future research exploring the differential impact of PBL in different educational contexts (Cascales & Carrillo-García, 2018).

In summary, the analysis of the 31 selected studies confirms that PBL is an effective methodology for promoting key competencies in early childhood education, with special emphasis on its applicability during the post-pandemic period. The distribution of the studies in terms of methodology and context underlines both the value of PBL in varied settings and the need to continue exploring its quantitative impact on the development of specific competencies and its effectiveness in diverse educational contexts.

## 4. Discussion

The findings of this systematic review reinforce the value of project-based Learning in Early Childhood Education as an effective methodology

for the development of key competencies such as creativity, critical thinking, problem-solving, and teamwork. These results coincide with previous

research highlighting how PBL fosters active and contextualized learning, allowing students to connect their learning with the environment and their interests, generating meaningful and lasting learning (Martínez Hernando, 2021; Osorio Pérez, 2024). This study contributes to the field by providing a comprehensive synthesis of recent research in Spain, thus filling a gap in knowledge about the specific impact of PBL in the early years of schooling (Apaza et al., 2022).

#### *Interdisciplinary approach to PBA*

PBL is characterized by its ability to integrate different areas of knowledge in an interdisciplinary manner, facilitating a deep understanding of concepts and promoting the transfer of skills between disciplines such as science, mathematics, and languages. This interdisciplinary approach allows students to address real problems, reinforcing transversal competencies, such as informed decision-making and problem-solving, essential in child development (Cascales et al., 2020; Lev et al., 2020). The review identifies a growing trend in studies towards the use of STEAM (Science, Technology, Engineering, Arts, Mathematics) approaches, highlighting how the combination of PBL with educational technologies enhances collaboration and adaptive learning, especially in the post-pandemic context (Wulandani et al., 2022; Hira & Anderson, 2021).

#### *Need for more research in early childhood education*

The review has highlighted a lack of studies focused on the Early Childhood Education stage, compared to other educational stages such as Primary and Secondary. This imbalance reflects a gap in knowledge, which is especially worrisome given that early childhood education is a critical stage in cognitive and socioemotional development (Li & Schoenfeld, 2019). The study confirms the observations of Arantes-Do Amaral (2021), who stresses that educational experiences in these early years lay the foundation for future learning. Despite the abundance of research on PBL in higher stages, this review demonstrates the urgent need for empirical studies that address the impact of PBL in Early Childhood Education, especially to guide teachers in the effective

implementation of this methodology from early ages (Aksela & Haatainen, 2019; Fernández-Cruz & Fernández-Díaz, 2016; Sánchez Garrido, 2021).

#### *Comparison between qualitative and quantitative approaches*

The predominance of qualitative studies (53.13%) reflects the interest in exploring and understanding the experiences of teachers and students in implementing PBL in Early Childhood Education. Qualitative studies provide rich insights into motivation and engagement in the classroom, but the limited presence of quantitative (28.13%) and mixed (18.75%) studies points to a need for more empirical evidence to generalize the effects of PBL and quantify its impact on specific competencies. Well-designed quantitative studies would be essential to validate qualitative findings and provide a more complete understanding of PBL in children's contexts. As Krajcik and Blumenfeld (2006) suggested, combining qualitative and quantitative approaches could provide a more robust and enriching analysis.

The studies analyzed suggest that PBL implementation varies significantly between public and private institutions. While some private schools have more resources and curricular flexibility to apply active methodologies, in the public sector, there may be limitations in terms of teacher training, curriculum load, and access to adequate educational materials (Cascales & Carrillo-García, 2018; Vasconcelos, 2007). These differences should be addressed in future research to ensure equity in the application of ABP and maximize its benefits in different educational contexts (Ruiz Hidalgo & Ortega-Sánchez, 2022).

#### *Limitations in current research and future opportunities*

This review highlights several limitations in the current research. The scarcity of longitudinal studies is a relevant finding since, although the studies reviewed show immediate benefits in developing key competencies, it is essential to know whether these effects persist over time (Sarceda et al., 2016). Longitudinal studies would make it possible to analyze the sustainability

of the benefits of PBL and its contribution to the comprehensive development of students throughout their educational trajectory (Ramey & Ramey, 2023). Another limitation observed is the geographic concentration of studies in urban contexts, which suggests a lack of knowledge about the potential of PBL to reduce educational inequalities in rural and disadvantaged contexts (Barrera Arcaya et al., 2022). These contexts represent a significant opportunity for future research that could examine how PBL can contribute to more equitable and accessible education. Also, the selection of studies focused exclusively on research published between 2020 and 2024, which may have excluded relevant prior work. In addition, most of the studies reviewed were qualitative in nature, which limits the generalizability of the findings to broader populations. Future research could address this gap through longitudinal studies and quantitative analyses to more accurately measure the impact of PBL in Early Childhood Education (Chen & Yang, 2019; Ramey & Ramey, 2023).

One of the main challenges identified in the studies reviewed is the lack of specific teacher training for implementing the Project Approach in Early Childhood Education. According to Barrera Arcaya, Venegas-Muggli, and Ibacache Plaza (2022), insufficient training limits the impact of PBL, as teachers may face difficulties in designing effective projects and adequately assessing children's learning. This reinforces the need to develop continuous training programs that integrate innovative pedagogical strategies and interdisciplinary approaches (Engel & Coll, 2022).

Another limitation identified in this review is the lack of specific data on the implementation of Project Based Learning (PBL) in differentiated contexts, such as public and private institutions. Many studies analyzed do not detail the type of educational center in which the Project Approach is implemented, which makes it difficult to identify key differences in terms of resources, teacher training, and pedagogical approaches. The availability of infrastructure, access to teaching materials, and the degree of curricular autonomy can significantly influence the effectiveness of PBL, but these factors are not always considered in

existing studies. Therefore, future research should focus on comparing PBL implementation in different types of schools, exploring how resource differences and teacher training impact learning outcomes (Ruiz Hidalgo & Ortega-Sánchez, 2022; Cascales & Carrillo-García, 2018).

Furthermore, this review has focused on the context of Spain, which is another limitation regarding the generalization of the results. Although the studies analyzed provide a valuable framework for implementing PBL in Early Childhood Education in this country, the literature reviewed does not include enough comparative studies with other educational systems. Given that the adoption of PBL can vary significantly according to each country's curricular frameworks, pedagogical culture, and educational policies, future research should expand the literature search to include international studies. This would allow for a more global view of the impact of PBL and the identification of innovative approaches and methodological adaptations in diverse educational contexts (Kokotsaki et al., 2016; Chen & Yang, 2019). Integrating international perspectives would strengthen the understanding of the optimal conditions for the implementation of PBL and facilitate the transfer of good practices between different educational systems.

In this sense, this review represents the first step in a broader research project whose next objective will be to conduct a systematic international analysis of Project-Based Learning in Early Childhood Education. This global study will contrast the experiences and results obtained in different educational systems, identifying common trends, barriers to implementation, and effective strategies for its optimization. The future international systematic review will contribute to a better understanding of PBL in different contexts and will facilitate the transfer of good practices between countries.

#### *Integration of technologies in PBL in Early Childhood Education*

The use of educational technologies within PBL has been explored in some studies, particularly in STEAM approaches. However, technology integration in PBL in Early Childhood Education

remains an under-researched area. Technologies can enrich PBL through tools that enhance collaborative and adaptive learning, particularly relevant in a post-pandemic educational context, where hybrid modalities and distance learning have gained importance (Hira & Anderson, 2021). The lack of comprehensive studies in this area suggests the need to explore how technologies can complement and strengthen PBL in Early Childhood Education, taking advantage of its possibilities to create more interactive and contextualized learning experiences (Domènech-Casal, 2018).

*Implications of the findings and lines of future research.*

This study reaffirms the importance of PBL in the development of fundamental competencies in Early Childhood Education, highlighting its transformative potential to foster active and meaningful learning. However, the identified limitations need to be addressed to maximize its effectiveness and understand its long-term impact. Future studies should focus on:

1. Conducting longitudinal studies to measure the sustained impact of PBL on the development of key competencies in students and to assess how these competencies

influence their learning over time (Ramey & Ramey, 2023).

2. Expanding research into more diverse geographic contexts, especially in rural and disadvantaged areas, to understand how PBL can contribute to educational equity and improve learning opportunities in less-resourced contexts (Barrera Arcaya et al., 2022; Lee, 2022).
3. Integration of technologies in PBL in Early Childhood Education, exploring how digital tools can enhance collaborative learning and the acquisition of digital competencies from an early age (Wulandani et al., 2022).
4. There should be a balance between qualitative and quantitative approaches, ensuring that both complement each other to provide a more comprehensive view of the impact of PBL. Qualitative studies provide valuable information on stakeholder perceptions, while quantitative studies are necessary to assess the impact on the development of specific competencies.

Addressing these areas will contribute significantly to both the research and practice of PBL in Early Childhood Education, providing tools and strategies for teachers to implement this methodology effectively and sustainably (Kołodziejski & Przybysz-Zaremba, 2017).

## 5. Conclusions

This systematic review has identified the effectiveness of Project Based Learning in Early Childhood Education and the challenges associated with its implementation. It is confirmed that PBL fosters fundamental competencies such as creativity, critical thinking, and collaboration (Lucenko et al., 2023); however, evidence suggests that its adoption requires favorable conditions, such as specific teacher training, adequate resources, and well-structured pedagogical approach (Barrera Arcaya et al., 2022).

The Project Approach significantly impacts students' academic performance and socio-emotional development, fostering an active and meaningful learning experience that connects knowledge with the student's immediate context (Chen & Yang, 2019). Despite these advances, its effective implementation requires teachers to be prepared to manage this integrative approach and consider educational technologies as an enrichment tool, an aspect still scarcely explored in Early Childhood Education (Wulandani et al., 2022).



From a practical perspective, the findings reinforce the need to strengthen initial and ongoing teacher training in active methodologies such as PBL. The lack of specific training may limit the effectiveness of this strategy, reducing its impact on student motivation and learning (Engel & Coll, 2022). Likewise, designing educational programs integrating PBL with interdisciplinary approaches, such as STEAM, is essential to enhance its applicability in the classroom (Santillán-Aguirre et al., 2023).

In summary, Project-Based Learning is revealed as a methodology with the potential to transform Early Childhood Education, promoting a personalized and contextualized educational experience that responds to students' individual needs. This review represents a first step in constructing a more solid empirical base on PBL in Early Childhood Education, laying the groundwork for studies of global scope that allow

contrasting experiences and implementation strategies in different educational systems.

Based on these findings, future research should focus on evaluating the impact of PBL in different educational realities, including large-scale analyses to identify common patterns and innovative approaches in diverse contexts. This study offers the first systematic review in the Spanish context of the Project Approach in Early Childhood Education, providing a key empirical basis for future research. Based on these findings, the next step will be to conduct a systematic review of the international scope, allowing the contrast of experiences, implementation strategies, and challenges in different educational systems. This future research will contribute to a better understanding of PBL in global contexts and facilitate the transfer of good practices between countries.

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