

A Systematic Literature Review of Project-Based Learning on Kindergarten Students Motor Development

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Abstract

The current research is a systematic literature review examining the impact of project-based learning (PBL) on kindergarten students' motoric development. The review focuses on the types of projects implemented, targeted motoric aspects, and methodological characteristics of previous studies. An initial search was conducted across three databases—Scopus, ERIC, and Google Scholar—and the selected studies were screened using the PRISMA protocol to ensure validity and relevance. Following the selection process, 30 publications were included for analysis. The findings show that research on this topic first emerged in 2015, with the highest number of publications occurring in 2024 (11 studies), involving a total of 548 kindergarten students. Collage-making was the most frequently implemented project, followed by sewing and origami activities. Most studies emphasized fine motor development, particularly hand-eye coordination, cutting, folding, pasting, grasping, writing, and drawing skills. Quantitative quasi-experimental designs were predominantly employed. Overall, the findings indicate a significant positive impact of PBL on kindergarten students' motoric development, contributing valuable insights for early childhood education practice and research.

Keywords: Project-Based Learning, Motoric Development, Kindergarten Education, Fine Motor Skills, Systematic Literature Review

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INTRODUCTION

Motoric development is a crucial aspect of kindergarten education, as it is closely linked to students' learning readiness and academic achievement. Macdonald et al. (2018) reported that both gross and fine motor skills contribute to measurable academic improvements by supporting physical engagement and body movement during learning. Such motoric development enhances executive functions, including attention, problem-solving, and goal-directed behaviour, which are essential for preschool students' cognitive development and learning readiness (Anisaturrahmi et al, 2025). In addition to academic benefits, motoric development also influences students' creativity and self-expression. Marinšek and Lukman (2021) noted that project-based motoric activities foster creative thinking by engaging students in problem-solving processes. Similarly, Tocci et al. (2022) highlighted that physical activities involving variability and improvisation

stimulate creative expression, as children explore new movement patterns and develop flexible thinking.

In regard to the importance of empowering students' motoric development in preschool, emphasising learning activities that can facilitate students' motoric activities is important. Ourda et al. (2025) stated that it is important to provide the conducive environment that encourages students' autonomy, exploration, and diverse movement opportunities, which can stimulate students' creativity and imagination capabilities. Richard et al. (2020) also stated that a classroom that emphasises students' movement is needed in order to facilitate the students' motoric development. In this case, project-based learning seems to be the actual learning strategy to facilitate students' motoric activity in the classroom. It is because project-based learning allows students to engage in extended projects that require investigation and physical involvement (Ridwan et al., 2021). This activity encourages students to make meaningful use of their physical abilities through the immersion, which improves students' gross and fine motor skills. Furthermore, in project-based learning, students often work in teams to solve problems. Mite et al. (2021) stated that working in a team is a part of social interaction that can promote the students' motoric abilities, as it requires shared physical activities such as role-playing or collective construction tasks. Other than that, the project is sometimes challenging, making students adapt and repeat the task continuously. This is significant for the students' motoric development, as it leads students to sustained engagement and physical activities over time.

On the importance of project-based learning on students' motoric development, detailed information about the implementation of project-based learning based on the research outcome is significant, as it can inform the current practice and best procedure to conduct the project-based learning. A systematic literature review is the process of gathering, evaluating and synthesising research findings related to a specific question. In this case, a systematic literature review can provide valid and reliable information about the impact of project-based learning on students' motoric development. This information is significant, as it reveals the true impact of the intervention, which accumulated from various research encompassing various research contexts, such as participant background and research setting (Sobieraj & Baker, 2021). This methodical procedure guarantees that all pertinent research is taken into account, offering a fair summary of the body of knowledge on a particular subject, contributing to generating high-quality evidence. Furthermore, a systematic literature review research can provide detailed information about the topic discussed. Fernández-Batanero et al. (2020) explained that a systematic literature review follows a rigour and integrates a research procedure that can encompass nuance and a comprehensive perspective on the topic discussed. Fauzi et al. (2024) also stated that this research procedure can give in-depth information which is valuable for stakeholders and decision makers. In this case, a systematic literature review can provide comprehensive information about project-based learning on kindergarten students' motoric development. For example, the impact of project-based learning, the kind of project often used, the targeted motoric development, as well as the methodological information related to this research topic.

However, a systematic literature review that specifically targets the impact of project-based learning on kindergarten students' motoric development is yet to be provided in the literature. In the kindergarten context, several systematic literature reviews focus on kindergarten motoric development but do not include project-based learning. For example, a systematic literature review by Adhe et al. (2024) examines the impact of augmented reality on kindergarten motoric development, and Smits- Engelsman et al. (2012) examine the efficacy of interventions to improve motor performance in children with developmental coordination disorder. There is also a systematic literature review involving project-based learning but it did not focus on kindergarten students' motoric development. In this case, Hayati and Syaikhu (2020) carry out a systematic literature review of the media of project-based learning for early childhood education.

Lesyani et al. (2024) conduct a systematic literature review on the implementation of project-based learning on stimulating kindergarten language development. To the best of our knowledge, a systematic literature review on the impact of project-based learning on kindergarten

students' motoric development is yet to be provided in the literature. Therefore, the current research aims to fill this gap by conducting a systematic literature review on the impact of project-based learning on kindergarten students' motoric development, focusing on several aspects such as;

1. What is the type of project implemented in kindergarten education targeting the student's motoric development
2. What is the type of motoric aspect developed?
3. What is the impact of project-based learning on kindergarten students' motoric development?
4. What is the methodology used in research related to the impact of project-based learning on kindergarten students' motoric development?

METHODS

The current study employs a systematic literature review (SLR) to examine the impact of project-based learning on kindergarten students' motoric development. An SLR involves the systematic identification, evaluation, and synthesis of existing research to address specific research questions and identify research trends and gaps. Accordingly, this review focuses on the types of projects implemented, targeted motoric aspects, reported impacts, and methodological characteristics of previous studies. To ensure methodological rigor and transparency, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol was adopted (Rahmatika et al., 2024). PRISMA provides a structured framework for formulating research questions, defining inclusion criteria, conducting systematic searches, and extracting and analyzing data, thereby enhancing the validity and reliability of the review.

The identification stage involved searching relevant literature using keywords derived from three core variables: project-based learning, kindergarten education, and motoric development. Keywords included "Project-Based Learning," "Project-Based Instruction," or "Project Approach"; "Kindergarten," "Preschool," or "Early Childhood Education"; and "Motor Development," "Fine Motor Skills," or "Gross Motor Skills." The detailed search terms are presented in Table 1.

Table 1. Keywords

Database	Search keywords
Scopus Google Scholar Eric	("Project Based Learning" OR "Project-Based Instruction" OR "Project Approach") AND ("Early Childhood Education" OR Kindergarten OR Preschool) AND ("Motor Development" OR "Gross Motor Skills" OR "Fine Motor Skills")

Following keyword formulation, identification stage was conducted using three databases: ERIC, Scopus, and Google Scholar. These databases were selected due to their broad coverage and relevance to educational research. Scopus provides extensive peer-reviewed journal coverage, ERIC is a leading database for education studies, and Google Scholar offers access to a wide range of scholarly materials. The search employed the keywords listed in Table 1, and inclusion and exclusion criteria (Table 2) were applied to ensure alignment with the research objectives. Eligible studies focused on project-based learning, kindergarten students, and motoric development; were original research articles; published in English; and available in full text, with no publication year restriction. Based on these criteria, 952 publications were identified from ERIC, 2 from Scopus, and 2,050 from Google Scholar, yielding a total of 3,004 records.

Table 2. Inclusion Criteria

Aspect	Inclusion	Exclusion
Title and content of the article.	A suitable title that meet the criteria.	irrelevant and failed to meet the standards.
Publication year	All time	-
Type of publication	Original research	Excluding studies that are non-empirical, along with reviews and editorials.
Language	English	Others
Accessibility	Full-text articles	Preview and fee are required

From the initial 3,004 records identified, titles and abstracts were screened to determine relevance. Publications were retained if they addressed project-based learning and motoric development at the kindergarten level; otherwise, they were excluded. As a result, 2,950 publications were removed for irrelevance, leaving 54 studies for the eligibility stage. During eligibility assessment, abstracts and full texts were reviewed to confirm alignment with the research focus. Twenty-four publications were excluded for not explicitly examining the impact of project-based learning on kindergarten students' motoric development. Consequently, 30 publications were included in the final analysis. The included studies were analysed thematically based on project type, motoric aspects examined, and methodological characteristics, including research design, methods, and data collection procedures. Publication year and sample size were also extracted. The results of the thematic analysis are presented in Table 3.

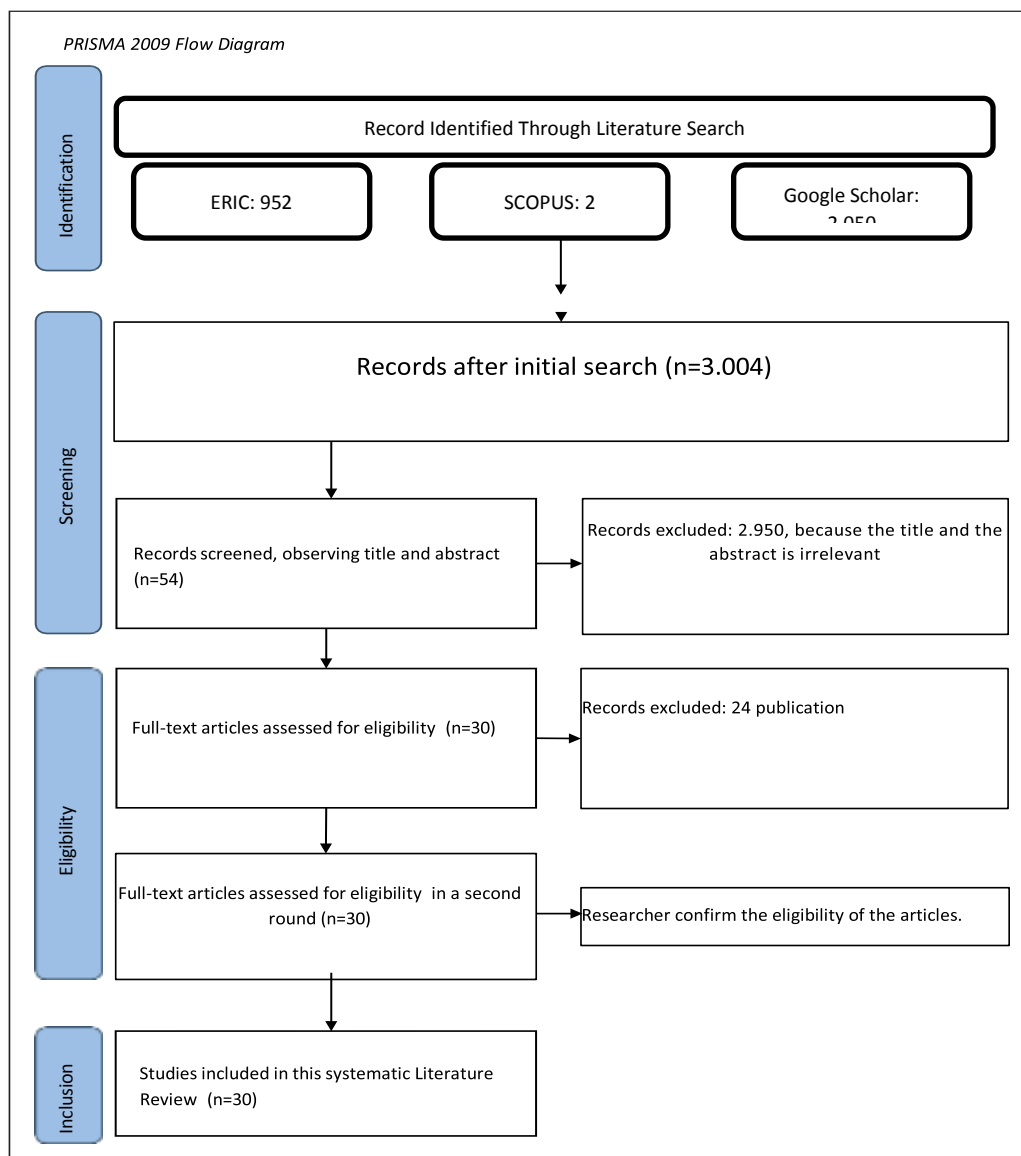


Figure 1. PRISMA Protocol

FINDING AND DISCUSSIONS

The current research is the systematic literature review research on the impact of PJBL on kindergarten students' motoric development. The total of 30 published articles selected based on the PRISMA protocol was reported. Research on the impact of PJBL on kindergarten students' motoric development was first published in 2015 with one article, and the most publications on this theme were in 2024 with 11 publications. Detailed information about the year of publication frequencies can be seen in figure 2. Furthermore, in the 30 articles, the total participants were 548 students. In this result section, several aspects will be further reported, namely the type of project implemented, the type of motoric aspect examined, and the research method used in research related to PJBL on kindergarten students' motoric development.

Publication Year Frequencies

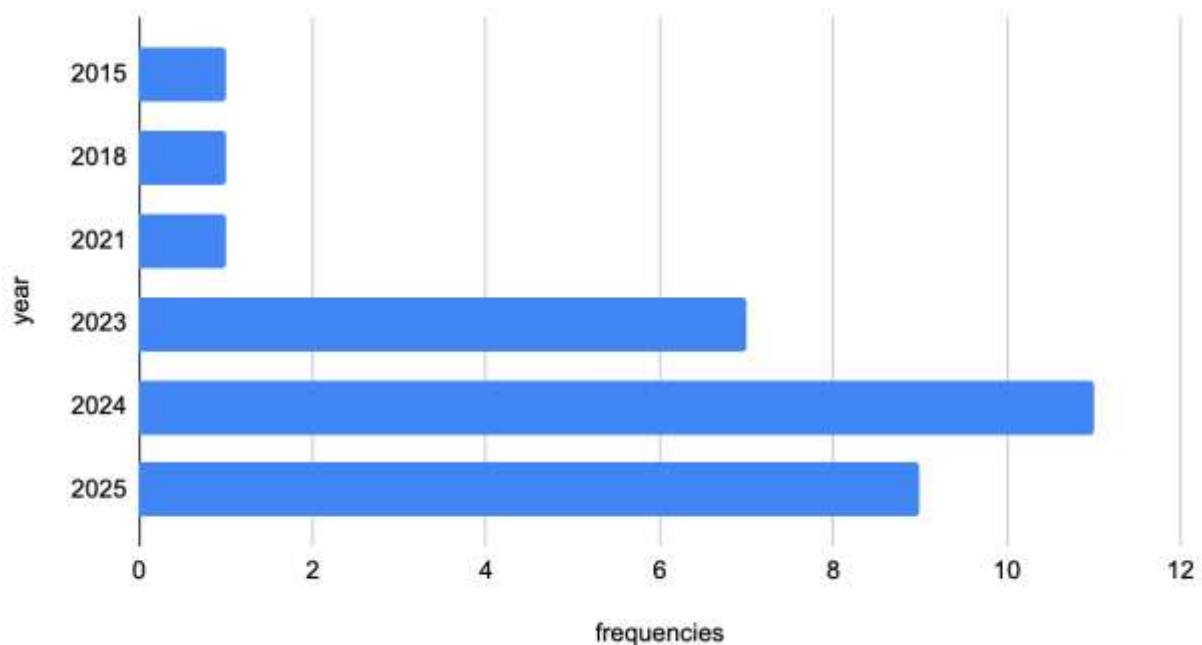


Figure 2. Publication Year Frequencies

The Type of Project

The first aspect examined in this systematic literature review is the type of projects implemented in classrooms. The thematic analysis shows that collage-making was the most frequently used project-based activity ($n = 4$), involving activities such as seed collages, natural material collages, and collages using inorganic waste. Other commonly implemented projects included sewing ($n = 2$), origami ($n = 2$), cooking activities ($n = 2$), Kokoru paper crafts ($n = 2$), paper folding ($n = 2$), and mosaic activities ($n = 2$).

A variety of other projects were reported in single studies, including batik making, gardening activities, puzzle making, colouring, scissor activities, planting, classroom decoration projects, wall magazines, toy construction, and kinaesthetic-based programs such as SKIP and the DONAT model. Overall, the findings indicate a wide range of project-based learning activities used to support motoric development, with collage-making emerging as the most commonly implemented project in kindergarten settings.

The type of motor examined

The second aspect examined in this review is the type of students' motoric development, which was categorised into gross and fine motor skills. The thematic analysis shows a strong dominance of fine motor development, examined in 29 of the 30 reviewed articles. Only two studies focused on gross motor skills, with one study addressing both gross and fine motor development.

Among studies focusing on fine motor skills, hand–eye coordination was the most frequently examined aspect ($n = 9$), followed by cutting skills ($n = 7$). Other commonly investigated skills included folding ($n = 4$), pasting ($n = 4$), holding ($n = 3$), and hand movement ($n = 3$). Less frequently examined aspects included handling and grasping (each $n = 2$), as well as writing, colouring, and drawing abilities (each $n = 2$). Several studies also addressed specific fine motor components such as hand precision, finger strength, rolling, threading, pattern arrangement, hand stability, picking, decorating, and arranging. Overall, the findings indicate that research on project-based learning in kindergarten predominantly targets fine motor development.

Table 3. The Finding of Students Fine Motoric Aspect

Fine Motoric	Authors
Hand eye coordination	Muji et al 2025; Ashar et al, 2025 Yulianasari and Sukiman 2024 Nuur and Chamidah 2025 Salsabila and faqihatiddiniah 2025 Amelia and Cinantya, 2024. Rachmayani et al, 2025. Fadhli et al, 2024 Fazira et al, 2023
Hand precision	Muji et al (2025)
Fine motor	Kustiawana et al (2021) Ababilayka and Suriansyah 2023 Khairah and Sari 2024 Raihamah and Suriansyah 2025
Cutting abilities	Asyifa and Suriansyah 2024 Maulidha and Purwanti 2023 Ashar et al, 2025 Niqa and Wahyudi 2024 Mufrida and Amelia 2024 Wardana et al 2025 Rahmaa et al, 2023
Handling	Marpuah and Aslamiah 2024 Nuur and Chamidah 2025
decorate	Marpuah and Aslamiah 2024
Holding ability	Rizkia et al 2024 Kholifah and Aslamiah 2025 Rahmaa et al, 2023
Finger strength	Ashar et al, 2025
Rolling	Ashar et al, 2025
Sticking	Ashar et al, 2025
Making lines	Listiyani 2024
folding	Listiyani 2024 Pramitasari and Laely 2023 Wardana et al 2025 Latipah et al, 2024
Grasping	Nuur and Chamidah 2025 Herawati et al, 2023.
Threading	Nuur and Chamidah 2025
pattern arrangement skills	Nuur and Chamidah 2025
Writing	Pramitasari and Laely 2023 Mufrida and Amelia 2024
Coloring	Pramitasari and Laely 2023 Wardana et al 2025
Drawing	Mufrida and Amelia 2024 Wardana et al 2025
Pasting	Mufrida and Amelia 2024 Wardana et al 2025 Asyifa and Suriansyah 2024 Rahmaa et al, 2023

Hand movement	Wardana et al 2025 Hafidzaha and Purwanti, 2025. Listiyani 2024
Hand stability	Rachmayani et al, 2025.
Picking up	Herawati et al, 2023.
Arranging ability	Fadhli et al, 2024

Research method

This subtheme examines the methodological characteristics of studies on project-based learning and kindergarten students' motoric development, including research design, methods, and data collection procedures. Most studies employed quantitative designs (n = 17), followed by qualitative research (n = 6), research and development approaches (n = 3), and mixed-method designs (n = 3).

Within quantitative studies, the dominant designs were quantitative observation (n = 11), quasi-experiments with one-group pre-test–post-test designs (n = 4), and quasi-experiments with control and experimental groups (n = 2). Observation checklists were the most commonly used data collection tool (n = 13), followed by tests (n = 5) and questionnaires (n = 2). Qualitative studies primarily relied on observation (n = 6), often supplemented by documentation (n = 3) and interviews (n = 1). Research and development studies used observation alongside interviews, questionnaires, and expert ratings, while mixed-method studies consistently employed observation and documentation, with occasional use of interviews. Overall, observation-based data collection dominated methodological approaches in this research area.

Table 4. Overall Finding

Author	Project	Type of motoric		Research design and procedure			Result
		Gross motoric	Fine motoric	Research design	Research method	Data collection procedure	
Altunsöz and Goodway (2015)	SKIP (successful kinesthetic instruction for preschoolers)	Coordination, Body balance and Large muscle strength	Ability to complete tasks requiring hand precision and Hand eye coordination	Quantitative	Quasi experiment with control and experiment group	Test	Significant
Muji et al (2025)	Batik making, exploring garden.	Gross motor		Quantitative	Quasi experiment with control and experiment group	Test, observation and questionnaires.	Significant
Kustiawana et al (2021)	Sewing clothing		Fine motor	Research and development		Observation	Suitable
Ababilayka and Suriansyah 2023	Making origami.		Fine motor	Qualitative		Observation	Significant
Asyifa and Suriansyah 2024	Making puzzle		Fine motor= Cutting and Pasting Skills	Qualitative		Observation and documentation	Significant
Maulidha and Purwanti 2023	Coloring papers with pictures.		Fine motoric= cutting out pictures based on patterns	Qualitative		Observation	Significant
Marpuah and Aslamiah 2024	Cooking activities.		Handling a knife properly and correctly, students can use skewers neatly, and children are able to carry out exploratory activities in decorating bread/fruit	Qualitative		Observation	Significant

			skewers using their right and left hands.”				
Rizkia et al 2024	Making Collage Artworks with Seeds		Children’s ability to hold writing instruments	Qualitative		Observation and documentation	Significant
Ashar et al, 2025	sunflower crafts from Kokoru paper		Stimulating hand–eye coordination, finger strength, concentration, and the ability to follow instructions Cutting, Rolling and sticking kokoru paper	Qualitative		Observation, interview and documentation	Significant
Yulianasari and Sukiman 2024	Magic zipper project		able to use eye and hand coordination functions to design the project	Research and development		Observation, interview and questionnaires	Significant
Listiyani 2024	Folding Paper		ability to make lines, draw shapes, coordinate eyes and hands, create shapes from various media, use media for artwork, and control hand movements that use fine muscles after paper-folding activities.	Quantitative	Quasi experiment with one group pre and post test	Observation	Significant
Nuur and Chamidah 2025	Creating bracelets		proper tool and material handling, grasping large and small beads with two fingers, threading string through large and small beads, pattern arrangement skills, hand-eye coordination,	Quantitative		Observation	Significant
Salsabila and	3d Paper		hand-eye coordination	Mixed		Observation,	Significant

faqihatiddiniah 2025	Sewing			method		interview and documentation	
Latipah et al, 2024	Paper folding activities.		The ability to fold the papers	Quantitative		Observation	Significant
Pramitasari and Laely 2023	making the Garuda from paper, making traditional clothing shapes, create classroom decorations they liked based on their own creative ideas and Making toy cars.		Writing, folding paper, coloring papers	Quantitative		Observation	Significant
Ariana and Novitawati 2023	Mosaics activity		Fine motor	Quantitative		Observation	Significant
Niqo and Wahyudi 2024	scissor activities= create an object-shaped craft.		Using their fingers to begin combining cutting activities from the initial stage to the more difficult ones	Quantitative		Observation	Significant
Khairah and Sari 2024	origami paper folding activities		Fine motor	Quantitative		Observation	Significant
Mufrida and Amelia 2024	Mosaics activity= Pasting mosaics accurately according to		Drawing, writing, cutting, pasting, and inserting blocks according to their shapes	Mixed method		Observation and interview	Significant

	the pattern.						
Wardana et al 2025	5M+PLAMS Activities		cutting patterns, pasting neatly, folding paper, drawing with detail, coloring within the lines, and playing with magic sand with better hand movement coordination.	Mixed method		Observation, documentation and interview	Significant
Kholifah and Aslamiah 2025	Cooking activities		children's ability to carry out exploration activities in making projects using their right and left hands. children's ability to hold and use a plastic knife properly and correctly. And children's ability to hold and use a toothpick properly and correctly	Quantitative		Observation	Significant
Raihamah and Suriansyah 2025	Project Based Learning		Fine motor	Quantitative		Observation	Significant
Rahmaa et al, 2023	Collage Activities Using Inorganic Waste Materials		Children are able to hold scissors properly, cut inorganic waste materials (plastic) according to their own preferences, use their fingers to paste inorganic waste materials (plastic), paste the inorganic waste materials (plastic) without going outside the lines, choose the plastic colors they desire,	Quantitative	Quasi experiment	Test	Significant
Hafidzaha and	Corrugated		Children able to imitate	Quantitative		Observation	Significant

Purwanti, 2025.	craft paper (Kokoru) project		shapes, the ability to effectively integrate what they see with their hand movements.				
Amelia and Cinantya, 2024.	DONAT model (Direct instructiON and media Awan pinTar)= cutting activities according to patterns with media Awan pinTar,		eye and hand coordination so that children move their fingers with the right movements, children are able to adjust the thickness of the media used starting from the lowest difficulty to the final cutting stage	Quantitative		Observation	Significant
Rachmayani et al, 2025.	Planting		Coordination between the hands and eyes, Directing hand and finger movements according to a plan, Stability of the hands and fingers, Control of the fingers and hands	Quantitative	Quasi experiment one group pre-test and post-test	Questionnaires	Significant
Herawati et al, 2023.	Seed Collage Activity		Ability to grasp and handle tools and materials provided Ability to apply glue on the picture pattern by moving the finger evenly across the surface Ability to pick up and place seeds (e.g., papaya	Research and development		Observation and expert rating scale.	Significant

			seeds) precisely onto the pattern Ability to complete and leave the collage to dry independently.				
Fadhli et al, 2024	Natural Material Collage		accuracy, hand-eye coordination, and creativity in arranging collage materials and analyzing the results of neatness in attaching natural materials to collages.	Quantitative		Observation	Significant
Maulidah et al, 2018.	Creating a classroom wall decoration		Coordinating the fine muscles of the hands to carry out intricate movements. Coordinating the finger muscles in creating various geometric shapes and forms of surrounding objects	Quantitative	Quasi experiment one group pre-test and post-test	Test	Significant
Fazira et al, 2023	Creating a wall magazine		Hand-eye coordination in carrying out activities, concentration in during the activities, achievement of completion in performing and accuracy in completing activities	Quantitative	Quasi experiment one group pre-test and post-test	Test	Significant

The current research is a systematic literature review examining the impact of project-based learning on kindergarten students' motoric development. Based on the thematic analysis, the most used project was making a collage, where students were making a picture or design by pasting cut-out materials. In the current research, it was found that this activity was significant for improving students' holding ability (Sarte et al., 2021; Nengsih & Handrianto, 2022; Rizkia et al., 2024), cutting and pasting ability (Rahmaa et al., 2023), grasping, applying and picking up ability (Herawati et al., 2023), hand-eye coordination and arranging material (Fadhli et al., 2024). The main reason for this significance, according to Rehana et al. (2022), is that the collage-making activity posed a challenge to students' ability to control hand movement, promoted finger dexterity and empowered overall student body coordination.

Wijaya et al. (2023) further explained that the collage activities let students engage their muscles and nerves in movement activities. It was the main reason that the collage activities can empower students' motoric development. It was confirmed through Hanafiah et al.'s (2023) research, which examines the impact of collage media on students' motoric development. They urge that collage media play a significant role in developing fine motor skills in early childhood, effectively illustrating the therapeutic benefits of such activities. In the current research, the collage activities used by the researcher were Making Collage Artworks with Seeds (Rizkia et al., 2024), Collage Activities Using Inorganic Waste Materials (Rahmaa et al., 2023), Seed Collage Activity (Herawati et al., 2023), and using natural material in a Collage project (Fadhli et al., 2024). These collage activities can be adopted and used by teachers in their classroom, where the teaching activities intend to develop students' motoric development.

Another key finding concerns the motoric aspects targeted in previous studies. Most research focused on fine motor development, particularly hand-eye coordination, cutting, folding, pasting, and holding activities. Fine motor skills involve precise movements controlled by small muscles in the hands and fingers. Pitchford et al. (2016) classify fine motor skills into fine motor integration—hand-eye coordination in response to visual stimuli—and fine motor precision, which involves manipulating objects with minimal visual input. Both categories were evident in the reviewed studies. Fine motor integration included hand movement, grasping, holding, and hand precision, while fine motor precision involved drawing, colouring, cutting, and picking activities. These findings align with Pitchford et al.'s framework. Emphasis on fine motor development is important, as it is closely linked to cognitive development, academic performance, and school readiness (Akin, 2019; Macdonald et al., 2018). Early interventions targeting fine motor skills have been shown to enhance cognitive, social, and academic outcomes, supporting children's autonomy and problem-solving abilities (Banseng et al., 2021; Waty et al., 2024).

Another important finding relates to the methodological approaches used in studies examining the impact of project-based learning on kindergarten students' motoric development. Most of the reviewed studies employed quantitative designs, accounting for 17 of the 30 publications. Observation-based designs were the most common (11 studies), where observational data were collected using checklists or rubrics and reported quantitatively through percentages. For example, Salsabila and Faqihatiddiniah (2025) used an observation checklist to assess the effect of 3D paper sewing on hand-eye coordination, reporting substantial improvements in students' activity and fine motor development. Such approaches align with Mullen's (2020) view that structured observation checklists enable standardized and quantifiable behavioral assessment. In addition to observations, several studies employed tests and questionnaires. Tests were used to examine the effects of SKIP and batik-making activities on students' gross motor development, while questionnaires were applied to assess projects such as the magic zipper and planting activities. Overall, quantitative methods—particularly structured observations—dominated research on project-based learning and kindergarten motoric development (Ramadhani et al., 2022; Tannoubi et al., 2023).

CONCLUSION

This systematic literature review synthesized 30 peer-reviewed studies from Scopus, ERIC, and Google Scholar using the PRISMA protocol. The findings indicate that project-based learning (PBL) has a consistently positive and significant impact on kindergarten students' motoric development. Most studies employed quantitative quasi-experimental designs, involving a total of 548 participants. Collage-making was the most frequently used project, followed by sewing and origami, reflecting an emphasis on hands-on, fine-motor activities. Research primarily focused on fine motor skills, including hand-eye coordination, cutting, folding, pasting, grasping, writing, colouring, and drawing. Overall, this review identifies key methodological trends and effective project types, offering valuable guidance for educators and researchers in designing PBL interventions and advancing research in early childhood education.

REFERENCES

- Ababilayka, R. S., & Suriansyah, A. (2023). Mengembangkan Aspek Motorik Halus Anak Menggunakan Model Project Based Learning, Metode Demonstrasi, dan Media Kertas Origami. *Gawi Journal of Action Research*, 3(2), 42–50. <https://doi.org/10.59329/gawi.v3i2.179>
- Anisaturrahmi, Othman, M. S., Veryawan, Ilham, M., & Imami, M. K. W. (2025). The effect of Drawing-Based Learning on kindergarten student's motoric development. In *Studies in systems, decision and control* (pp. 273–280). https://doi.org/10.1007/978-3-031-95280-7_27
- Adhe, K. R., Ardha, M. a. A., Yang, C. B., Bikalawan, S. S., Putra, A. B., Herawati, H., & Herista, S. V. W. (2024). The implementation of augmented reality to develop early childhood students' gross motoric skill: a systematic review. *Retos*, 61, 1091–1100.
- Akin, S. (2019). Fine motor skills, writing skills and physical education based assistive intervention program in children at Grade 1. *Asian Journal of Education and Training*, 5(4), 518–525. <https://doi.org/10.20448/journal.522.2019.54.518.525>
- Altunsöz, I. H., & Goodway, J. D. (2015). SKIPing to motor competence: the influence of project successful kinesthetic instruction for preschoolers on motor competence of disadvantaged preschoolers. *Physical Education and Sport Pedagogy*, 21(4), 366–385. <https://doi.org/10.1080/17408989.2015.1017453>
- Ashar, S., Wahyudi, M., Arifah, N. N., & Musthofa, A. J. (2025). Pembelajaran Kertas Kokoro untuk Melatih Motorik Halus Anak di PPT Sekar Wangi Kecamatan Pakal Surabaya. *Journal of Early Childhood Education Studies*, 5(1), 185-207.
- Astawa, I. M. S., Suarta, I. N., & Astini, B. N. (2023). Pengembangan Kegiatan Kolase Biji-bijian Untuk Meningkatkan Perkembangan Motorik Halus Anak Usia 5-6 Tahun. *Journal of Classroom Action Research*, 5(1), 19-25.
- Asyifa, M. D. N., & Suriansyah, A. (2024). Meningkatkan Mengembangkan Motorik Halus Menggunakan Model Project Based Learning, Direct Instruction dan Media Puzzle pada Anak Usia Dini. *Gawi Journal of Action Research*, 4(2), 48–54. <https://doi.org/10.59329/gawi.v4i2.174>
- Banseng, S., Sandai, R., & Rasool, S. (2021). Language of strata and expression in construction of sampi amongst iban community in malaysia. *International Journal of Education, Information Technology, and Others*, 4(3), 417-427. <https://doi.org/10.5281/zenodo.5169017>
- Fadhli, H., Fellysya, N. S., Alfayutia, W., Putri, R., & Arsaf, M. A. (2024). Meningkatkan potensi kreatif dan motorik halus anak usia dini dengan kolase bahan alam. *Jurnal Anugerah*, 6(2), 191–200. <https://doi.org/10.31629/anugerah.v6i2.7302>
- Fauzi, K., Jaelani, M. H., Wati, A. P., Murwani, F. D., & Wardana, L. W. (2024). Increasing Student Proactivity Through Entrepreneurship Education (A Studi Systematic Literature Review). *Journal of Educational Analytics*, 3(2), 151–160. <https://doi.org/10.55927/jeda.v3i2.9277>

- Fernández-Batanero, J. M., Montenegro-Rueda, M., Fernández-Cerero, J., & García-Martínez, I. (2020). Digital competences for teacher professional development. Systematic review. *European Journal of Teacher Education*, 45(4), 513–531. <https://doi.org/10.1080/02619768.2020.1827389>
- Hafidzah, N., & Purwanti, R. (2025). Mengembangkan Motorik Halus Anak Menggunakan Model Project Based Learning, Metode Demonstrasi Dan Media Kertas Kokoru Di Kelompok B TK Betlehem. *Journal Educational Research and Development| E-ISSN: 3063-9158*, 1(4), 493-502.
- Hanafiah, N. A., Mokodenseho, S., Dewi, R. a. P. K., Zahrudin, A., & Palayukan, H. (2023). Collage media to develop fine motor skills in early childhood. *Bulletin of Early Childhood*, 2(1), 10. <https://doi.org/10.51278/bec.v2i1.711>
- Hayati, M., & Syaikh, A. (2020). Project-based learning in Media Learning Material Development for Early Childhood Education. *Deleted Journal*, 6(2), 147–160. <https://doi.org/10.14421/al-athfal.2020.62-05>
- He, W., & Chen, M. (2024). Advancing Urban Life: A Systematic review of emerging technologies and artificial intelligence in urban design and planning. *Buildings*, 14(3), 835. <https://doi.org/10.3390/buildings14030835>
- Kustiawan, U., Maningtyas, R. D. T., Putra, A. P., & Asmah, A. (2021). Designing Clothing Patterns to Promote Fine Motor Skills: A Research and Development Project. *International Journal of the Whole Child*, 6(2), 9-18.
- Latipah, S., Yon, A. E., & Mulyanti, F. (2024). Meningkatkan Motorik Halus Anak Usia Dini Melalui Keterampilan Melipat Kertas di Tk Al-Falah. *KAPATU: Jurnal Pendidikan Dasar*, 1(2), 31-37.
- Lesyani, Z., Budiarti, E., & Priyanti, N. (2024). Implementation of Project-Based Learning Model in stimulating language development of early childhood. *Journal of Childhood Development*, 4(2), 405–418. <https://doi.org/10.25217/jcd.v4i2.4692>
- Listiyani, A. (2024). Peran Kegiatan Melipat Kertas untuk Mengembangkan Motorik Halus, Kreativitas dan Percaya Diri Siswa di TK A XYZ Jakarta. *Jurnal Syntax Admiration*, 5(9), 3268-3278.
- Macdonald, K., Milne, N., Orr, R., & Pope, R. (2018). Relationships between Motor Proficiency and Academic Performance in Mathematics and Reading in School-Aged Children and Adolescents: A Systematic Review. *International Journal of Environmental Research and Public Health*, 15(8), 1603. <https://doi.org/10.3390/ijerph15081603>
- Marinšek, M., & Lukman, N. (2021). Teaching strategies for promoting motor creativity and motor skill proficiency in early childhood. *Economic Research-Ekonomska Istraživanja*, 35(1), 2645–2653. <https://doi.org/10.1080/1331677x.2021.1974306>
- Marpuah, M., & Aslamiah, A. (2024). Meningkatkan Aktivitas Belajar Tanggung Jawab, dan Motorik Halus Anak Melalui Model Project-Based Learning (PjBL)-Make A Match. *Gawi Journal of Action Research*, 4(2), 82–90. <https://doi.org/10.59329/gawi.v4i2.172>
- Maulidha, S., & Purwanti, R. (2023). Mengembangkan Kemampuan Motorik Halus Anak dalam Menggunting Gambar Sesuai Pola Menggunakan Model Project Based Learning, Metode Demonstrasi, dan Media Kertas Warna Bergambar. *Gawi Journal of Action Research*, 3(1), 33–41. <https://doi.org/10.59329/gawi.v3i1.188>
- Mite, A. D., Eveline, S., & Robinson, S. (2021). Catholic Religious Learning with the Project Based Learning (PjBL) Approach: Validity and Feasibility. *Journal of Education Research and Evaluation*, 5(2), 185. <https://doi.org/10.23887/jere.v5i2.32300>
- Muji, A. P., Bentri, A., Jamaris, J., Rakimahwati, R., Hidayati, A., Darmansyah, D., & Hidayat, H. (2025). Unlocking potential: how project-based learning influences kindergarten motor skills. *Retos*, 63, 289–301. <https://doi.org/10.47197/retos.v63.112107>
- Nengsih, Y. K. & Handrianto, C. (2022). *Andragogi: Seni membelajarkan orang dewasa*. Bening Media Publishing.

- Nuur, D. M., & Chamidah, A. N. (2025). Enhancing fine motor skills through Project-Based learning. *Journal of Innovation and Research in Primary Education*, 4(3), 1516–1524. <https://doi.org/10.56916/jirpe.v4i3.1568>
- Ourda, D., Kavoukoglou, A., Gregoriadis, A., & Barkoukis, V. (2025). The role of school Environment on the sustainable development of Pre-Schoolers' motor creativity. *Sports*, 13(7), 229. <https://doi.org/10.3390/sports13070229>
- Pitchford, N. J., Papini, C., Outhwaite, L. A., & Gulliford, A. (2016). Fine Motor Skills Predict Maths Ability Better than They Predict Reading Ability in the Early Primary School Years. *Frontiers in Psychology*, 7. <https://doi.org/10.3389/fpsyg.2016.00783>
- Pramitasari, D., & Laely, K. (2023). Peningkatan kemampuan motorik halus melalui metode proyek untuk anak usia 5 – 6 tahun. *Bosowa Journal of Education*, 4(1), 190–194. <https://doi.org/10.35965/bje.v4i1.3770>
- Rahmatika, N., Hanapi, M. H. B. M., Jendriadi, J., Sariasih, Y., Imami, M. K. W., & Uslan, U. (2024). The Impact of flipped learning on Students' critical Thinking; A Systematic literature review. *International Journal of Learning Teaching and Educational Research*, 23(10), 180–206. <https://doi.org/10.26803/ijlter.23.10.9>
- Ramadhani, D., Kenedi, A. K., & Rafli, M. F. (2022). Advancement of STEM-based digital module to enhance HOTS of prospective elementary school teachers. *Jurnal Pendidikan Progresif*, 12(2), 981-993. <http://dx.doi.org/10.23960/jpp.v12.i2.202245>
- Rehana, N., Komariyah, N. N., & Wilujeng, N. I. (2022). The effect of playing collage on the development of fine motorics in preschool children. *International Journal of Health Engineering and Technology*, 1(2). <https://doi.org/10.55227/ijhet.v1i2.39>
- Richard, V., Ben-Zaken, S., Siekańska, M., & Tenenbaum, G. (2020). Effects of movement improvisation and aerobic dancing on motor creativity and divergent thinking. *The Journal of Creative Behavior*, 55(1), 255–267. <https://doi.org/10.1002/jocb.450>
- Rizkia, A., Muzakki, M., & Saudah, S. (2024). Pembuatan karya seni kolase dengan Biji-Bijian untuk meningkatkan motorik halus anak di TK Harapan Bangsa Desa Hampalit Kecamatan Katingan Hilir Kabupaten Katingan. *Jurnal Pengabdian Sosial*, 1(4), 216–221. <https://doi.org/10.59837/ggx5tp40>
- Salsabila, A. N., & Faqihatuddinyah. (2025). Mengembangkan Motorik Halus Anak Melalui Kombinasi Model Project Based Learning dan Metode Montessori (Practical Life) dengan Media 3d Paper Sewing pada Kelompok A TK Kristen Betlehem Banjarmasin. *Jurnal Pendidikan Anak Usia Dini*, 2(4), 12. <https://doi.org/10.47134/paud.v2i4.1760>
- Sarte, N. M. R., Santiago, B. T., Dagdag, J. D., & Handrianto, C. (2021). Welcome back: The return of college dropouts to school. *Jurnal Pendidikan dan Pemberdayaan Masyarakat (JPPM)*, 8(2), 140-149. <https://doi.org/10.36706/jppm.v8i2.15386>
- Serpentino, C. (2011). “The moving body”: a sustainable project to improve children's physical activity at kindergarten. *International Journal of Pediatric Obesity*, 6(sup2), 60-62.
- Smits-Engelsman, B. C. M., Blank, R., Van Der Kaay, A., Meijs, R. M. D., Brand, E. V. D., Polatajko, H. J., & Wilson, P. H. (2012). Efficacy of interventions to improve motor performance in children with developmental coordination disorder: a combined systematic review and meta-analysis. *Developmental Medicine & Child Neurology*, 55(3), 229–237. <https://doi.org/10.1111/dmcn.12008>
- Tannoubi, A., Quansah, F., Magouri, I., Chalghaf, N., Bonsaksen, T., Srem-Sai, M., Hagan, J. E., Azaiez, F., & Bragazzi, N. L. (2023). Modelling the associations between academic engagement, study process and grit on academic achievement of physical education and sport university students. *BMC Psychology*, 11(1), 1-9. <https://doi.org/10.1186/s40359-023-01454-2>
- Tocci, N., Scibinetti, P., Mazzoli, E., Mavilidi, M. F., Masci, I., Schmidt, M., & Pesce, C. (2022). Giving ideas some legs or legs some ideas? Children's motor creativity is enhanced by physical activity enrichment: direct and mediated paths. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.806065>

- Wardana, A. R., Prayogo, B. H., & Suwargono, T. (2025). Improving Fine Motor Skills of Kindergarten Children Through 5M+ PLAMS Activities at Aisyiyah Kindergarten Bustanul Athfal A. *Ceria: Jurnal Program Studi Pendidikan Anak Usia Dini*, 14(2), 283-303.
- Waty, E. R. K., Nengsih, Y. K., & Rahman, M. A. (2024). The quality of teacher-made summative tests for Islamic education subject teachers in Palembang Indonesia. *Cakrawala Pendidikan: Jurnal Ilmiah Pendidikan*, 43(1), 192-203. <https://doi.org/10.21831/cp.v43i1.53558>
- Wijaya, R. G., Darizal, D., Sabillah, M. I., Annasai, F., & Fitri, E. S. M. (2023). The effect of playing playdough and collage on improving fine motor skills in early childhood in terms of independence. *Retos*, 51, 1146–1152. <https://doi.org/10.47197/retos.v51.101396>
- Yulianasari, N., & Sukiman, N. (2024). Development of Project-Based teaching modules to improve fine motor skills of early childhood. *Journal of Scientific Research Education and Technology (JSRET)*, 3(3), 1109–1121. <https://doi.org/10.58526/jsret.v3i3.475>