

**EMPOWERING YOUNG LEARNERS:
FOSTERING OWNERSHIP AND CONTRIBUTION IN
EARLY CHILDHOOD PROJECT-BASED LEARNING**

¹Memet Sudaryanto, ²Dinda Amelia, ³Chafit Ulya

¹Universitas Jenderal Soedirman, Indonesia

²Universitas Negeri Yogyakarta, Indonesia

³Universitas Sebelas Maret, Indonesia

Corresponding email: memet.sudaryanto@unsoed.ac.id

doi : 10.24832/jpkp.v18i1.1212

ABSTRACT

This study investigates student engagement and contributions in project-based learning within early childhood education settings. The objectives of this approach include developing skills, emotions, traits, and critical thinking abilities. The participants were teachers and students from eight ECE institutions in Tegal and Pekalongan districts. Data were drawn from principals' and teachers' observations of classroom learning, with an activity checklist serving as the primary instrument. Data analysis followed four steps: collection, reduction, conclusion drawing, and presentation. Findings indicate that students engaged in project-based learning were able to practice problem-solving skills, while teachers served as project planners and facilitators to maximize learning outcomes. The achievement graph of project learning success shows that each topic has accomplished its goal. The Trash Can Project (Topic 3) achieved a 100% success rate, while the Bread-Making Project (Topic 6) reached 98%. These results strengthened students' understanding of communication processes and fostered pride in project outcomes. The study highlights the importance of policies that encourage schools to adopt child-centered learning models. The success of project-based learning also depends on careful planning, appropriate scheduling, developmental readiness, and teachers' classroom management experience.

Keywords: early childhood education; project-based learning; teaching and learning; learning innovation; critical thinking skills

INTRODUCTION

In recent years, early childhood education (ECE) has gained attention for its long-term impact on children's academic and personal development. ECE is designed to promote optimal growth and prepare children for further education. As nations strive to improve educational outcomes, understanding how early learning environments foster readiness for formal schooling is increasingly critical.

ECE teaching and learning activities are carefully tailored to align with the developmental needs of young children. Ariyanti (2016) describes ECE as educational guidance for children from birth to age six, focusing on both physical and spiritual growth. Similarly, Yoshikawa et al. (2016) emphasize the importance of high-quality ECE programs in building foundational skills that support future academic achievement, as well as the need for early interventions that nurture holistic development. Since children are naturally inclined toward play, teachers must design enjoyable learning experiences that integrate motor, cognitive, social, language, and moral development.

ECE programs are centered on the whole child, enabling growth in accordance with national philosophies. Children, as newcomers to the world, lack knowledge, norms, and social conventions (Nufus, 2016; Raihana, 2018). Educators play a critical role in shaping children's personalities during these formative years. Their professionalism allows them to motivate children's learning through structured guidance. As Sari et al. (2020) note, children require assistance in making sense of phenomena in their environment. Such interactions are expected to develop personality, morality, social competence, and character. Sulistyawati (2016) further stresses the need to instill national, religious, moral, and social values in early childhood to prepare children for future challenges.

ECE is also intended to equip children with the ability to anticipate, engage with, and adapt to their environment. Educators must foster talents through varied, engaging, and developmentally appropriate activities that reflect multiple intelligences. According to Clark (as cited in Satriana et al. 2021), children's sensory development can be categorized into four domains: tactile (touch), visual (sight), auditory (hearing), and motor (movement).

Children's developmental aspects can be effectively enhanced through integrated learning models. Raharja (2020), drawing on Darling-Hammond et al., identifies four foundational pillars of learning: (1) learning to know, (2) learning to do, (3) learning to be, and (4) learning to live together. These principles provide the basis for designing meaningful and age-appropriate learning experiences.

ECE institutions, teachers act as facilitators who expand children's social knowledge through interaction with their surroundings. Learning experiences must be play-based, allowing children to engage actively, voluntarily, joyfully, and democratically while stimulating curiosity.

Oktari (2021) defines projects as in-depth investigations into topics that capture children's attention and merit extended exploration. Topic selection requires consideration of both relevance and knowledge depth. DongJin and Ashari (2024) found that project-based learning enhances children's engagement, critical thinking, and collaboration by addressing real-world issues. Furthermore, Lin et al. (2021) further demonstrate that incorporating engineering design processes into STEM-based project learning significantly improves design thinking and conceptual clarity. Thus, PjBL fosters critical thinking, emotional awareness, and social competence, while expanding creativity, talents, and interests.

Creativity development in ECE is vital. Rahman (2009) describes children's natural creativity as encompassing imagination, initiative, curiosity, and confidence. Encouraging creativity requires intentional strategies that allow children to explore, innovate, and express themselves.

Sudaryanto et al. (2020) note that teachers must create conditions that support originality in children's expression, primarily through play-based methods that stimulate the senses.

Project-based learning has been adopted as a teaching strategy that promotes problem-solving and peer collaboration. Dewey (as cited in Widiastuti, 2012) emphasized that projects allow children to pursue through curiosity. Teachers guide this process by offering information, facilitating choices, and fostering responsibility in problem-solving.

Project implementation in ECE typically proceeds through three stages: initiating, developing, and completing the project (Çabuk & Haktanır, 2010; Tasci, 2015). Initiation begins with drawing on children's experiences and memories. Development focuses on achieving learning objectives through real-world interactions, such as excursions or expert visits. Completion involves guiding children to finish, evaluate, and reflect on their projects.

Ultimately, project-based learning enables children to collaboratively investigate topics of interest while promoting contextual, hands-on learning. Chen et al. (2017) identify its benefits, including responsibility, collaboration, persistence, and opportunities to explore talents and creativity.

Despite these benefits, limited research has examined the extent to which project-based learning enhances creativity in structured early childhood settings. This study therefore addresses the question: *How does implementing project-based learning in early childhood education influence children's creativity and engagement in classroom activities?*

RESEARCH METHODS

The problem formulation in this study was to investigate the contributions of early childhood education (ECE) students in solving problems within project-based learning. To address this, data were analyzed qualitatively using a case study approach. A case study is distinct in that it draws on multiple data sources and collection methods that interact to create a specific context. The participants were ECE students from Tegal and Pekalongan, representing eight schools. Data sources included principals' and teachers' classroom observations.

Data were collected using an activity checklist that documented students' contributions during the learning process. This instrument also served as a guide for analyzing how students contributed to completing projects assigned by teachers. The checklist was constructed based on project-based learning theory relevant to ECE. In addition, an interview instrument was developed to gather information from teachers and principals. The instrument covered the learning topic, instructional materials, teacher-provided stimuli, student responses, the number of students involved, student characteristics, student contributions, and teacher roles. Project outcomes and success factors were also assessed at the conclusion of each project. Instrument validity was tested using theoretical triangulation and expert judgment. Data analysis employed Miles & Huberman's (2012) interactive model, which includes data collection, data reduction, data display, and conclusion drawing.

In this study, data were gathered through classroom observations, teacher interviews, and documentation of student project. The data were then reduced the data by selecting information that reflected children's creativity and engagement during project-based learning. The reduced data were displayed in thematic matrices to identify patterns and categories related to creativity development. Finally, conclusions were drawn by interpreting patterns and cross-checking them with research questions, supported by theoretical triangulation and expert review.

RESEARCH FINDINGS

This study investigates the role of children as active agents in project-based learning (PjBL) within early childhood education (ECE) environments. Findings indicate that children are not merely passive recipients of instruction but active participants who initiate ideas, engage in collaborative problem-solving, interact meaningfully with peers, and make decisions throughout the project cycle. Their consistent engagement across diverse classroom projects highlights their capacity to shape learning experiences when appropriately facilitated.

Learning activities in ECE settings are intentionally designed to stimulate holistic development and promote self-directed learning. Recognizing the importance of early developmental stages, both educators and parents emphasize the need for rich, supportive learning experiences that lay the groundwork for future educational success. As foundational education, ECE fosters cognitive and emotional growth while cultivating essential life skills. Teachers serve as facilitators and learning designers whose creative use of diverse media and pedagogical strategies significantly impacts learning outcomes, particularly in the cognitive, affective, and psychomotor domains.

Children in early childhood typically display high levels of physical activity, curiosity, imagination, and exploratory behavior. These characteristics necessitate instructional approaches tailored to their developmental needs and interests, such as project-based learning. Resnick (2017) noted that PjBL offers authentic, experiential opportunities by engaging children in the exploration and resolution of real-world problems. For example, children may design trash bin from recycled jugs or bake bread by preparing ingredients, mixing dough, baking, and cleaning up. Such activities provide meaningful experiences that support emotional, cognitive, and motor development. However, project design in ECE must be carefully calibrated—neither too simple nor too complex—given the wide developmental range of young learners. Thus, project themes require thoughtful planning by teachers and oversight from administrators to ensure pedagogical alignment and quality implementation.

ECE, as defined in national policy, provides educational stimulation for children from birth to age six to support physical, emotional, and cognitive development and prepare them for formal schooling. This principle of independent learning underpins innovative projects that challenge children to solve everyday problems individually or in groups. Interaction between developmental processes and life experience becomes the medium for achieving learning goals. In practice, teachers collaborate with principals and parents to determine themes and topics, ensuring optimal competency growth. Teacher testimonies from PjBL activities—such as *jumputan batik* (traditional tie-dye), exploration of local professions, and parent participation in “parent class” programs—illustrate how PjBL connects learning with real-life contexts while fostering collaboration and creativity (see Table 1).

Table 1 Testimonial of Project-Based Learning (PjBL) Implementation in the Classroom

No	Question	Answer
1	What new things have you implemented in the Merdeka Curriculum?	1. Provide continuous understanding of the curriculum. 2. Identify expected learning outcomes. 3. Introduce P5 (Profil Pelajar Pancasila). 4. Conduct project activities and contextualized learning.
2	Tell us about your project experience in class!	“When carrying out the project with the children, it was enjoyable to make jumputan batik. We also explored the school environment and learned about local professions (e.g., rental service, vegetable seller, tailor, screen printer). Parents were also involved through a parent class program.”

Source: Research Primary Data

Children require consistent support from their environment, particularly parents, who serve as primary companions during their developmental years. While parental involvement is crucial, this study focuses on children’s agency within PjBL in ECE classrooms. This perspective highlights children’s contributions without diminishing the complementary role of parents at home.

Parents are expected to reinforce foundational skills at home, but disparities in involvement persist due to time, resource, or knowledge constraints. In school, teachers act as facilitators, designing structured yet flexible learning experiences that support holistic development. Within today’s global education context, teachers must cultivate not only academic competence but also attitudes and practical skills for future competitiveness.

To ensure meaningful and measurable learning outcomes, teachers establish success indicators aligned with ECE developmental goals. These serve as both instructional guides and evaluative tools across

cognitive, social-emotional, and motor domains. Embedding reflective practices even at an early age fosters self-awareness of learning progress. Sequential, scaffolded, and sustainable instruction ensures continuity, coherence, and maximized contributions in PjBL environments.

The progression of classroom materials from simple to complex allows children to develop problem-solving skills in real contexts. Some of the classroom themes are presented in Table 2.

Table 2 Themes and Learning Topics

Theme	Learning Topics
Imagination and Creativity	Create activities using waste paper
Pekalongan City	Appreciating batik as local wisdom
Making Trash Cans	a) Keep the environment clean b) Dispose of waste properly c) Demonstrate creativity
Simple Science (Water) Park	Capillarity and absorption experiments a) Environmental care b) Waste types and processing c) Garden benefits d) Plant parts and functions e) Eco-bricks; f) Early literacy in environmental writing g) Number concepts through eco brick results
Cooking Class	Baking bread as a hands-on project
I love Earth	a) Crop planting, environmental exploration
Air Vehicles	Passenger aircraft, military aircraft, rockets, hot-air balloons, piston planes

Source: Research Primary Data

In early childhood education, the selection of learning topics and materials must be both culturally responsive and developmentally appropriate to ensure meaningful engagement and comprehension. This requires educators to design learning experiences that reflect and respect the diverse cultural, linguistic, and socioeconomic backgrounds of children in their classrooms. By integrating content relevant to children's lived experiences, teachers build strong connections between home and school, fostering belonging and validation. In addition, materials and activities should align with developmental stages, using age-appropriate visual and verbal cues. Effective communication in early learning relies on children's ability to interpret symbols and messages; when instruction fails to connect with their interests or cognitive readiness, focus and understanding are hindered. Thus, culturally grounded, child-centered pedagogy is essential for holistic development and early learning success.

Teachers must therefore prepare ECE teaching materials that both engage children and expand their learning. Such materials can motivate children and increase their interest in learning. Teaching materials may be defined as systematically designed learning resources presented in clear, communicative language for easy comprehension. Asmariyani (2016) emphasizes that teaching materials are structured to develop children's skills through information, knowledge, experiences, and teacher-stimulated activities, thereby ensuring smooth teaching and learning processes.

Teaching materials guide children toward achieving learning objectives through standardized content components. At the ECE level, they are designed to provide meaningful, engaging experiences that support development. Teacher creativity is central to developing resources that enhance children's problem-solving skills and overall competence. Varied materials can be delivered through diverse stimuli that teachers design based on student characteristics. According to Sudaryanto et al. (2020), learning materials are organized to present a complete picture of the competencies children are expected to master. The selection of teaching materials in ECE should follow key principles to ensure effectiveness: stimulating children's interest, clearly communicating learning objectives, incorporating flexible instructional designs, offering ample practice opportunities, and addressing potential learning challenges (Azizah, 2013). Consistent with Müller et al. (2023), the quality of instructional design strongly influences early learning outcomes, highlighting the need for engaging activities, clear structure, and active interaction to support child development.

Table 3 highlights the development of learning material guidelines, continuous evaluation practices, and stakeholder involvement to ensure instructional materials remain relevant, engaging, and aligned with children's learning needs.

Table 3 Worksheet: Aspect of Merdeka Curriculum Implementation

Analytical Aspect	Findings and Strategic Development	
What Has Been Done Well So Far	1	Vision and mission aligned with the institution's characteristics
	2	School administration system and curriculum
What Needs to Be Improved / Done Better	1	Project-Based Learning
	2	Diversity in learning materials
	3	Student involvement
	4	Supporting resources
	5	Quality of teaching staff
	6	Reflective learning culture
	7	Continuous evaluation
Strategies to Be Implemented	1	Involve all elements of the education unit, education authorities, parents, and students
	2	Collaboration between teachers and students
	3	Develop learning guides and material
	4	School digitalization
	5	Teacher training
Stakeholders to Be Involved	1	School Principal
	2	Teachers
	3	Supervisors / Inspectors
	4	Parents
	5	Students
	6	Early Childhood Teachers (PAUD)

Source: Research Primary Data

The more diverse the students, the more diverse the required stimuli. Materials are developed from learning outcomes and objectives, often using project-based learning models. Content should both support project-based approaches and provide markers of skill achievement in early childhood. Materials must be concise and comprehensive to prevent boredom and should meet standards of factual accuracy, conceptual and theoretical rigor, and methodological appropriateness. Attention must also be given to time allocation, presentation, and comprehension relative to early childhood standards.

Varied stimuli produced varied responses, enabling children to achieve maximum competency. This aligns with the principle of the Merdeka Curriculum, which recognizes each child's uniqueness and the teacher's responsibility to nurture it. Children's diverse potentials—academic, artistic, or athletic—must be cultivated through appropriate learning programs.

The project method was chosen as an effective method to stimulate creativity and problem solving. Teachers provide stimuli that encourage children to create new products or ideas. According to Yusuf et al. (2023), stimuli should be delivered holistically, offering social information that enables children to understand their environment in ways suited to their needs and characteristics. Examples of teacher-provided stimuli and corresponding responses are presented in Table 4.

Table 4 Materials and Stimulus-Responses

Material	Stimulus	Response
Making pulp out of paper	Provide scissors, glue, prints, dyes, and prompts such as, "How do you make the paper crumble" or "What do you put it on so that it sticks?"	Children create pulp out of paper
Environmental hygiene	a) Show a video about garbage disposal b) Visit a landfill c) Provide tools and materials	Children enthusiastically make trash cans from gallon water bottles
Capillarity concept	Experiment with colored water transferred between glasses via tissue paper.	The children observe with enthusiasm water moves and colors mix
I Love Earth	Provide guidance, motivation, and fine motor activities to build self-confidence and independence	Children respond with happiness and enthusiasm
Air vehicle	a) Introduce hot air balloons b) Ask guiding questions c) Explore children's prior knowledge d) Demonstrate balloon flight	Children show strong enthusiasm

Source: Research Primary Data

In one project, learning across schools was organized into several study group models. Some schools involved all students in a joint project, while others divided classes into small groups of three to five students.

Communication is a key strategy for building effective educational interactions. Teachers convey subject matter in ways that must be understood and internalized to influence children's behavior. As Trianggono (2020) stated, learning success is determined by the effectiveness of educational communication in schools, which is grounded in understanding basic communication concepts.

The communication process established in schools has a significant impact on children. Teacher–student interactions are dynamic and play a central role in achieving learning objectives. A clear example can be seen in Table 5, which highlights planning, teamwork, documentation, and collaboration among teachers, principals, parents, and donors. Communication goes beyond two-way exchanges; it aims to foster meaningful human development. Effective educational interactions influence not only students but also the overall quality of education.

Messages are an important element of instructional communication because the subject matter that the teacher wants to convey to students needs must be understood and mastered. In learning

communication, messages play a very important role. Messages are packaged as enjoyable and novel stimuli for students. Without messages in the form of stimuli, communication will not proceed effectively. To realize effective educational communication in channeling messages to early childhood, teachers are required to play an active and responsible role in child development. The effectiveness of channeling messages on learning depends on both parties. However, because educators hold class control, the responsibility for delivering healthy and effective messages lies primarily with the teacher.

Students are the elements that receive the stimuli given by the teacher. Their attitudes in responding to the stimuli will vary, depending on the characteristics of the student who receives them. In studying attitudes, three important variables are attention, understanding, and acceptance. These three variables determine how students respond after receiving a message or stimulus. Attitude here refers to the tendency to act, think, perceive, and feel toward objects, ideas, situations, or values.

Table 5 Project-Based Character Education Planning Framework

Key Element	Action Plan / Details
Goals	1. Character building from an early age 2. Contributing to the community and surrounding environment
Activities	1 Creating a well-structured plan 2 Designing the project 3 Managing the project 4 Planning the time allocation for the project 5 Preparing the teamwork 6 Planning the budget to be used 7 Documenting and reporting project result 8 Evaluation
Indicators	1 Change in students' character 2 Student quality 3 Implementation time and cost match the targeted plan
Stakeholders	1 Teacher: Plan the project, determine the activity flow, create strategies, and conduct assessment 2 Principal: Plan the project, design it, and prepare the team 3. Supervisor: Support, give feedback, and provide input on project activities 3 Parents: Involved in helping with project activities 4 Donors / School Partners: Provide support and sponsorship, contribute additional needed funding
Time Required	2 weeks

*Data card 0.28 (Worksheet 6 Result)

Source: Research Primary Data

Children in early childhood tend to be curious. This desire emerges as a natural drive to understand the world around them. The process of fulfilling this curiosity is accompanied by the development of unique personalities in each child that distinguish them from others. Every child has different characteristics, whether in terms of interests, motivation, potential, or other factors. This uniqueness aligns with children's concrete thinking, in which what is seen and known is considered real. This

also impacts the egocentric tendencies of each individual. Children's perspective, shaped by their own thinking, sometimes lead to conditions of resistance when faced with demands contrary to their wishes. In addition, children's attitude toward stimuli are usually active and energetic. Various activities are performed without boredom or stopping. In their efforts to learn new things, children develop an adventurous spirit.

Teachers need to provide a variety of stimuli to students so that their learning activities can proceed optimally. Stimuli serve both as interventions and as experiments in developing students' abilities. Teachers' skills in varying stimuli are among the factors that influence and increase children's engagement in learning, ensuring they remain actively involved in the process. These skills include varying tone of voice, using gestures, integrating visual aids, and applying interactive questioning techniques to maintain student attention and motivation. This finding is supported by interviews with early childhood educators, who emphasized that such strategies significantly enhance children's enthusiasm and participation during lessons.

"When I speak, I adjust my way of speaking to match how young children in early childhood education communicate. In addition, to demonstrate the lesson effectively, teachers also need teaching aids that support visual learning." (Teacher Interview, translated from Indonesian)

Teachers need to vary their stimuli in teaching through movement (not only sitting or standing in front of the class but using gestures), media (using diverse learning methods at specific intervals), and interactions (adopting different seating arrangements). The effect of teacher-provided stimuli is evident in students' attention during instruction and their active participation in learning activities. Stimuli may be accepted or rejected: if rejected, the teacher's message is ineffective; if accepted, it indicates student attention and message effectiveness. When the message captures attention, it is understood, and the student progresses to the next stage of learning.

Students gradually process messages, leading to willingness to act in response to stimuli (attitude). Stimuli affect students' actions (behavioral change) with support from facilities and environmental encouragement. If students pay attention, communication occurs, comprehension follows, and the next process builds on their ability. This results in a willingness to change attitudes once communication is effective.

The learning process strengthens bonds, associations, traits, and behavioral tendencies linked to the presence of stimuli and student responses. Responses are generated as evidence of capturing the teacher's message. Effective message management is reflected in students' ability to behave differently as a result of learning. A child is considered to have learned when they demonstrate behavioral change. For example, if a child cannot yet read despite effort and consistent instruction, the absence of observable improvement indicates that learning has not occurred.

Various stimuli encourage positive student responses when paired with rewards that function as reinforcement. Although the theory of reinforcement stems from behaviorist experiments with animals, its application in learning requires attention to general principles. Stimulus provision and message delivery are interrelated; teachers must ensure alignment between stimulus functions and learning objectives.

In project-based learning, children's contributions extend beyond responding to teacher-led stimuli; they also generate autonomous initiatives that reflect their active roles. Findings highlight that children are not passive recipients of instruction but active contributors who generate ideas, collaborate, participate directly, and reflect on real-world problems. This underscores the importance of positioning children as central agents in their learning journeys, affirming their capacity to shape educational experiences meaningfully.

DISCUSSION

ECE students' contributions in learning can maximize the effectiveness of stimuli, manifested through interactive processes. Although children in the foundational phase may not yet fully engage in productive learning, project-based learning requires each child's participation. Mewar et al. (2021) emphasize that project-based learning focuses on children's ability to explore knowledge through experience and curiosity to solve problems. Effective project management is therefore necessary to maintain learning flow.

Project-based learning can be implemented at all education levels. Although often applied simply, using materials from the surrounding environment, designed goals can still be achieved. Given children varied exploratory abilities, project-based learning is an appropriate method, provided student-generated ideas and concepts are considered. Teachers implement project-based learning by presenting real-life examples and involving students as project designers. Before the project begins, teachers explain the background and the problem to be solved.

Data Card 1

Some children enjoyed crumpling paper, others preferred coloring pre-made prints, while others enjoyed decorating printouts with colored paper.

In Data Card 1, children actively participated in various project tasks according to their individual preferences—crumpling paper, coloring printed images, or decorating outcomes. These actions reflected ownership and meaningful engagement in the learning process. This finding aligns with Prachagool (2021), who showed that project-based learning, when integrated with literature and hands-on activities, fosters children's independence and deeper understanding through authentic engagement. The data also illustrate that each child assumed a specific role within the project, contributing to the successful achievement of learning objectives. Although the steps were simple, they provided rich and meaningful learning experiences. The teacher's role—as planner, motivator, and facilitator—was crucial in ensuring that each child's learning journey unfolded effectively and purposefully.

Data Card 2

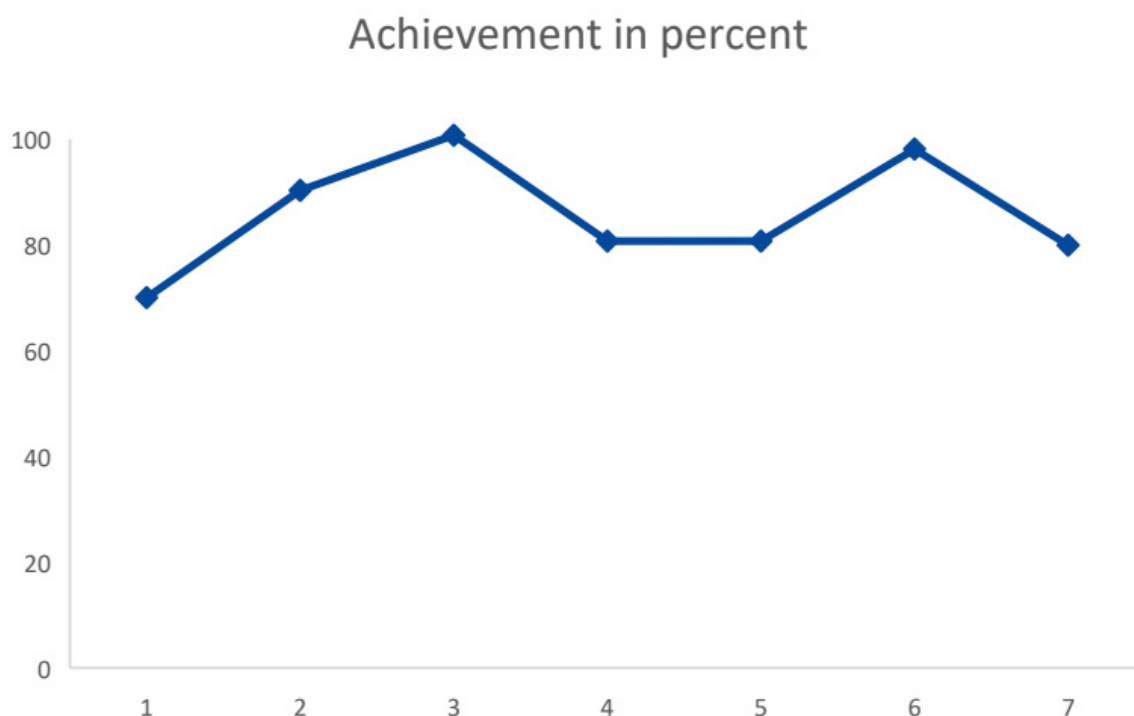
Children participated as makers of trash bins, cleaning and painting used gallons to be repurposed. They also helped prepare equipment, experimented with color mixing, and actively assisted in preparing tools and ingredients for bread-making. Children took turns making their favorite bread and helped clean up afterward.

In Data Card 2, children played a central role in creating trash bins and preparing ingredients for bread-making, actively engaging from planning to execution and completion. Their involvement demonstrated not only increased responsibility but also the development of self-regulation skills. These findings support Murti and Rolina (2024), whose quasi-experimental study confirmed that project-based learning significantly enhances critical thinking in children aged 5–6, emphasizing the importance of active participation in project implementation. The teacher, meanwhile, acted as a facilitator by preparing tools and materials, offering guidance, and stepping in only when tasks—such as cutting holes in the trash bins—exceed children's physical capabilities. Through such facilitation, children developed self-confidence, autonomy, and fine motor skills, making the learning process both empowering and developmentally meaningful.

Picture 1 depicting the project learning success shows that each topic has accomplished its goal. The Trash Can Project (Topic 3) achieved a 100% success rate, while the Bread-Making Project (Topic 6) reached 98%. Factors contributing to project success include children's high interest in project activities, as seen in their enthusiasm during completion. The development of learning abilities in children is not solely determined by cognitive abilities but is also shaped by non-cognitive factors such

as emotions, motivation, personality, and the environment in which they grow.

Motivation is a key factor in children's learning. Children's motivation often stems from personal interest (Nurinayah et al., 2021). Thus, teachers are expected to create engaging learning environments. Children's achievement is directly influenced by teaching strategies, and one particularly effective strategy is play. Play fosters holistic development because it allows all aspects of a child's growth to unfold naturally. This aligns with the principle of early childhood education—learning through play. The success of project-based learning, however, also depends on external factors such as school conditions and the availability of adequate learning resources to help stimulate developmental achievements in children.



Picture 1 Student Achievement Percentage

Source: Research Primary Data

Project learning design is an effective approach that requires teachers to create meaningful and engaging early childhood learning media. Supporting experimental tools should be included to help children recognize their environment as a natural learning resource. Teachers must innovate in project methods, maximizing diverse media and techniques to present content that supports effective and efficient learning.

Learning media for early childhood plays an essential role in facilitating teacher-student interaction and communication. Media must be aligned with themes, sub-themes, and learning objectives. Moreover, flexible media are particularly valuable, as they enable deeper exploration of children's thinking abilities.

During assessment, teachers monitor children's implementation of learning. At the final stage, teachers and students test project results and reflect on their experiences. Teacher may take the following steps: (a) determine essential questions, (b) design project plans, (c) create schedules, (d) monitor students and project progress, (e) assess outcome, and (f) evaluate experiences.

Children prefer learning through play, while instructional concepts are integrated into enjoyable activities. Early childhood education must embrace the principle of learning through play because

children absorb knowledge more effectively in a joyful, pressure-free environment. According to Sudaryanto et al. (2021), enjoyment generates intrinsic motivation, which fosters positive emotions and curiosity about learning activities. Thus, teachers should create playful environments that encourage independence, self-confidence, and fine motor development.

Project-based learning plays a critical role in sustaining children's enthusiasm and motivation. Contextualizing projects with familiar materials and enjoyable processes has proven effective in fostering intrinsic motivation and engagement. This approach nurtures pride, confidence, and independence as children take ownership of their creations (Yu, 2024). This finding aligns with Jdidou et al. (2023), who argue that project-based learning, when combined with adaptive instructional systems and personalized experiences, enhances long-term engagement and learning performance among young learners.

CONCLUSION AND POLICY RECOMMENDATIONS

This study highlights the significant role of intrinsic motivation in shaping the engagement and contributions of children aged 0–6 years in project-based learning environments. The observed activities reveal that children actively participated in designing, constructing, and completing group projects, such as making trash bins. Their involvement extended from idea generation and material preparation to assembly and presentation. These contributions not only enhanced children's fine motor skills and self-confidence but also fostered ownership and agency in the learning process.

To maximize children's contributions in project-based learning, policies should encourage schools to adopt child-centered models that empower children to make active decisions throughout the learning experience. Professional development for teachers is needed to cultivate learning environments that stimulate creativity and meaningful participation. Assessment frameworks must also be designed to evaluate not only academic outcomes but also children's collaboration, creativity, and individual contributions. Early childhood education programs should evaluate not only academic outcomes but also collaboration, creativity, and individual contributions. In doing so, educational systems can foster independence, responsibility, and emotional engagement in learning from an early age.

Intrinsic motivation plays a pivotal role in fostering positive emotional responses and sustained interest in learning activities. For learning to be effective, teachers must design stimulating and creative play environment that encourage exploration and self-expression. When children take pride in their accomplishments, they develop greater independence, confidence, and fine motor control. However, the success of project-based learning also depends on thorough planning, appropriate scheduling, children's developmental readiness and capabilities, and teacher expertise in classroom management. Aligning lesson plans with weekly activity schedules ensures coherence between objectives and project execution. In this context, teachers and children collaborate in selecting and executing projects—such as making trash bins—while responsibilities are distributed evenly across student groups to ensure active and equitable participation.

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