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DEVELOPING FINE MOTOR SKILLS IN 4–5 YEAR OLD CHILDREN THROUGH LOOSE PARTS MEDIA AT RA SAKILA KERTI

[1]Nur Rizki Oktaviana, [2]Moch Bayu Ibrahim S
[1]RA Sakila Kerti Kota Tegal, Indonesia
[1,2]Pendidikan Guru Pendidikan Anak Usia Dini, Universitas Terbuka, Indonesia
[1]nurrizkioktaviana13@gmail.com, [2]bayuibrahim51@gmail.com

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ABSTRACT

This study explores the effectiveness of loose parts media in enhancing fine motor skills among 4–5 year old children at RA Sakila Kerti. While previous research highlights the importance of fine motor development for school readiness, many early childhood education centers still rely on rigid and repetitive methods that limit creativity and engagement. Addressing this gap, the study applies a qualitative case study approach to investigate how open-ended, exploratory activities using loose parts can support children's motor development in a more meaningful and developmentally appropriate way. Data were collected through direct observation and interviews with teachers and parents. Initially, children exhibited challenges in tasks such as pinching, gluing, and arranging small items. After participating in activities like sorting, threading, and collage-making with loose parts, they showed notable improvement in finger strength, focus, and coordination. Additionally, the activities fostered social-emotional growth, as children collaborated, communicated, and expressed their creativity. Teachers played a key role in facilitating learning without restricting exploration. Aligned with the Merdeka Curriculum, the study concludes that loose parts media not only support fine motor skill development but also promote critical thinking, independence, and holistic learning. These findings offer practical insights for early childhood educators seeking child-centered, sustainable strategies.

Correspondence Author:

Nur Rizki Oktaviana
RA Sakila Kerti Kota Tegal, Indonesia
nurrizkioktaviana13@gmail.com

1. INTRODUCTION

The early years of a child's life, particularly between the ages of 0–6 years, are often referred to as the "golden age" due to the rapid and foundational developmental changes that occur during this period (Purwanti et al., 2024). This phase is marked by significant growth in physical, cognitive, social-emotional, language, and motor skills. One of the most essential aspects of this development is fine motor skills, which involve the coordination of small muscles in the hands and fingers, and are closely related to tasks such as writing, cutting, stringing, and manipulating small objects (Fardhinah & Cinantya, 2024). These skills are not only critical for self-care and academic preparedness but also form the basis for future learning and independence.

Children between the ages of 4 and 5 are at a critical juncture in developing these fine motor abilities, which serve as the foundation for higher-level academic competencies such as handwriting and early mathematics (Falera, 2024). Research has consistently shown that children with well-developed fine motor skills demonstrate greater school readiness and academic achievement (Putro et al., 2024). Therefore, the early stimulation of these skills through developmentally appropriate activities is imperative. Yet, a significant gap persists between the theoretical importance of fine motor development and its practical application in early childhood classrooms (Dini, 2023). Many preschool programs still rely on repetitive, product-oriented tasks that neglect the exploratory and process-based learning experiences necessary for skill mastery (Marinho, 2024).

The current study addresses this discrepancy by investigating an innovative approach: the use of loose parts media as a pedagogical tool to foster fine motor development. Loose parts are open-ended materials natural or manufactured that children can manipulate, combine, redesign, and experiment with. These materials include bottle caps, leaves, stones, straws, wooden blocks, buttons, and other reusable objects (Imamah & Muqowim, 2020). The flexibility and open-ended nature of loose parts promote not only motor development but also creativity, problem-solving, and social interaction. This approach aligns with Nicholson's (1971) Loose Parts Theory, which posits that the richness of an environment depends on the variety of elements available for manipulation, thereby enhancing children's creativity and engagement.

Recent studies have further reinforced the efficacy of loose parts play in early education settings. Hadiyanti et al. (2021) found that children who frequently engaged with loose parts exhibited notable improvements in both fine motor coordination and divergent thinking. Similarly, research by Setiawati et al. (2024) demonstrated that using differentiated instruction strategies with loose parts media enhanced children's reasoning, literacy, and collaborative skills. Despite these findings, loose parts learning remains underutilized in many early childhood education centers in Indonesia, primarily due to a lack of training, resources, or awareness among educators (Astuti & Suryani, 2024). This highlights a clear research gap: while the benefits of loose parts are acknowledged in theory, their systematic implementation, particularly in relation to fine motor development, requires further exploration.

RA Sakila Kerti, located in the Tegal Timur District of Tegal City, represents a valuable site for this research. Initial observations indicate that many of its 4–5 year old students face challenges in performing tasks requiring fine motor coordination, such as using scissors, manipulating glue sticks, or stringing beads. These difficulties point to a lack of adequate stimulation and underscore the need for engaging and developmentally appropriate interventions. Loose parts media offer a promising solution by transforming everyday items into tools for learning that are cost-effective, accessible, and aligned with sustainable education practices (Hakim et al., 2023).

Moreover, the use of loose parts corresponds with the principles of the Merdeka Curriculum currently implemented in Indonesia. This curriculum promotes contextual, differentiated, and student-centered learning environments where children are encouraged to explore, question, and create (Retnaningsih & Khairiyah, 2022). The curriculum's emphasis on the development of the Pancasila Student Profile particularly the traits of critical thinking, independence, and creativity finds a practical application through loose parts pedagogy. Teachers, in this model, shift from being directive instructors to becoming facilitators who support exploration and discovery (Hadar & Brodi, 2021).

This study, therefore, holds both theoretical and practical significance. Theoretically, it contributes to the growing body of knowledge on play-based and exploratory learning models in early childhood education, particularly in under-researched contexts such as Indonesia. Practically, it offers teachers and policymakers concrete strategies for enhancing fine motor skills through sustainable and child-friendly approaches. The research aims to examine how loose parts media can be systematically implemented in classroom settings to support fine motor development in 4–5-year-olds at RA Sakila Kerti, and how these practices can inform broader pedagogical models.

Furthermore, loose parts media align well with the developmentally appropriate practice (DAP) framework, which advocates for hands on, sensory rich, and meaningful experiences tailored to young children's interests and abilities (Rozak, 2021). Activities such as sorting bottle caps by color, building towers with sticks, or creating collages with leaves and buttons offer not only opportunities to strengthen fine motor control but also foster spatial awareness, bilateral coordination, attention to detail, and persistence. These outcomes are vital for a smooth transition to formal schooling and the acquisition of foundational academic skills.

The researcher also recognizes the role of contextual and thematic learning in integrating loose parts into the existing curriculum. Themes such as "Animals" or "Transportation" can be used to guide activity planning, allowing children to create relevant artifacts using loose parts while engaging with broader learning objectives (Maryanti et al., 2024). This thematic integration makes learning more meaningful and cohesive, supporting both fine motor development and cognitive engagement.

Moreover, this study underscores the importance of family involvement in early education. Parents can contribute by supplying loose parts from home and encouraging children to explore materials outside of school. This collaboration between home and school fosters consistency, reinforces learning, and strengthens the child's developmental environment (Rohmah et al., 2023). It also promotes sustainability and awareness of environmental stewardship from an early age.

In conclusion, the present study addresses a critical gap in early childhood education by focusing on the practical application of loose parts media to improve fine motor skills. It builds upon existing literature, such as the work of Dinicahyani & Jamil (2023), which emphasizes the dual development of creativity and critical thinking through play. At the same time, it contributes new insights into how this approach can be adapted to the specific cultural and educational context of RA Sakila Kerti and similar institutions. By doing so, this research supports the broader aim of enhancing early childhood education quality through methods that are innovative, inclusive, and grounded in the developmental needs of young learners.

2. METHOD

This study employed a qualitative approach with a case study methodology to obtain a comprehensive and contextual understanding of fine motor skill development through loose parts media (Creswell, 2014). The research focused on one specific setting Class A of RA Sakila Kerti, located in Tegal Timur District, Tegal City, Central Java chosen for its distinctive characteristics and relevance to the study objectives. Participants were selected using purposive sampling to ensure that the subjects met the developmental age criteria of 4–5 years, a critical period for fine motor growth according to Piaget's theory of cognitive development (Santrock, 2018). A total of 10 children from Class A were involved, selected based on preliminary observations indicating challenges in fine motor tasks. In addition to the children, two classroom teachers and four parents were included as supporting participants to provide insight into learning activities and developmental progress. Data were collected through direct observations, semi-structured interviews, and documentation. Observations were used to capture real-time behaviors and interactions, while interviews with teachers and parents served to explore perceptions and validate observed changes. To ensure the validity of the findings, the study employed methodological triangulation by comparing data from different sources and methods observational records, interview transcripts, and student work samples (Miles, Huberman, & Saldaña, 2014). This triangulation process strengthened the credibility and trustworthiness of the data by cross-verifying patterns and interpretations. The analysis followed Miles et al.'s (2014) interactive model, which included data reduction, data display, and conclusion

drawing, allowing for systematic interpretation of the developmental changes observed in the participants.

3. RESULT AND DISCUSSION

This study was conducted at RA Sakila Kerti, an early childhood education center in Tegal Timur District, which served as the research setting due to its unique implementation of loose parts media in early childhood learning. The main goal was to explore how the use of loose parts media supports the development of fine motor skills in 4–5-year-old children. The qualitative data were collected through direct observation, interviews with teachers and parents, and documentation analysis, focusing on children's ability to perform hand-eye coordination tasks, such as pinching, stringing, sticking, cutting, and arranging objects (Terpadu et al., 2024).

Figure 1. Students in Line

During the initial phase of observation, it was evident that many children had not yet developed adequate fine motor control. For instance, several children struggled to manipulate small items like buttons and beads. They displayed difficulty in maintaining hand strength and control, became easily frustrated, and were inconsistent when arranging items by pattern or color. Activities involving glue, scissors, and stringing required more precision than most children could manage. As a result, they would often abandon tasks quickly or appear disengaged (Putro et al., 2024).

Figure 2. Students Arranging Letters with Loose Part Bottle Caps

Figure 3. Students Sticking Turtle Shapes with Loose Part Leaves

However, after consistent exposure to structured loose parts activities, significant developmental progress was observed. The materials used included bottle caps, popsicle sticks, buttons, dried leaves, stones, and small wooden pieces items that were easy to manipulate, safe, and contextually familiar to the children. These materials were organized in ways that allowed open-ended play and creative use. Children were encouraged to sort, connect, stack, or collage using the materials freely, which gave them agency in their learning and reduced performance anxiety.

For example, children created patterns with bottle caps, strung beads using yarn, and built structures using twigs and stones. They engaged in repeated yet varied experiences, promoting coordination, strength, and endurance in their hand muscles. Unlike repetitive worksheets, these activities emphasized the process over the product and encouraged exploration and discovery. According to Nicholson's Loose Parts Theory, the richness of the environment significantly affects a child's creativity and problem-solving capacity (Nicholson, 1971; Hadiyanti et al., 2021). This was reflected in how children began developing an interest in more complex constructions and demonstrating increased focus and enthusiasm.

Over time, their fine motor coordination visibly improved. Children who initially had difficulty picking up small objects began manipulating them with greater precision. Tasks like gluing or stringing beads, once a source of frustration, became enjoyable and manageable. They demonstrated better control, improved bilateral coordination, and could perform tasks for longer periods without fatigue. These findings echo those of Simoncini and Meeuwissen (2024), who found that loose parts play improves not only motor skills but also children's ability to concentrate and persist through challenges.

Table 1. Development of Children's Fine Motor Skills After Using Loose Parts Media Activities

No	Child's Name	Initial Condition	After Intervention (Loose Parts Media)
1	Child 1	Difficulty sticking to the target	Stick with more precision
2	Child 2	Easily gets tired when sticking	Able to stick for longer periods with more concentration
3	Child 3	Struggles to focus when arranging small objects	Becomes more focused and meticulous when arranging
4	Child 4	Finger movements are still stiff	Finger movements become more flexible and controlled
5	Child 5	Slow in completing fine motor-related tasks	Completes tasks more quickly and accurately

Beyond the physical benefits, the social-emotional development of the children was also significantly enhanced. Teachers noted that children who were initially passive or withdrawn began participating more actively in group tasks. The open-ended nature of loose parts play fostered a sense of belonging and collaboration. Children were often observed negotiating, sharing materials, and working together to complete structures or group collages (Setiawati et al., 2024). These moments

allowed children to develop empathy, communication skills, and confidence in expressing their ideas key elements of social-emotional learning.

Additionally, quiet or less verbal children began engaging in conversation during the activities, using the materials as communication tools. One child who was previously reluctant to participate in discussions began explaining their creations to peers, which, according to teachers, was a remarkable transformation. This observation aligns with the findings of Rohmah et al. (2023), who highlight that child-centered and hands-on approaches in early childhood education can significantly enhance children's emotional security and verbal expression.

The learning environment also became warmer and more supportive. The teacher's role shifted from instructing to facilitating, allowing her to interact more personally with each child. Children felt seen, heard, and supported, which encouraged them to take risks and explore new tasks without fear of failure. This sense of psychological safety is critical in early childhood development and correlates with improved persistence, patience, and resilience. As children began to master tasks that were previously difficult, they experienced a boost in self-esteem and a sense of achievement (Falera, 2024; Astuti & Suryani, 2024).

Loose parts activities were also found to stimulate other developmental areas, such as logical thinking and creativity. Children developed classification skills as they sorted objects by shape, size, or color. When building towers or arranging objects into patterns, they practiced problem-solving, spatial awareness, and estimation (Dinicahyani & Jamil, 2023). These cognitive processes are often interlinked with fine motor tasks and reinforce academic readiness in early childhood.

The flexibility of the loose parts method allowed it to be adapted to weekly themes and integrated into broader curricular goals. For instance, during a theme on "Animals," children were invited to create animal figures using seeds, twigs, and paper cutouts. During a unit on "Transportation," they constructed vehicles using cardboard and bottle caps. This thematic integration helped solidify content knowledge while strengthening fine motor precision, making learning both meaningful and enjoyable (Maryanti et al., 2024).

Moreover, family involvement emerged as an important factor in sustaining the success of the program. Parents contributed by sending safe materials from home, such as recycled items or natural materials found in the environment. Teachers reported that children were more enthusiastic when they could bring and share items from home, reinforcing the connection between school and family learning. This aligns with the principle of sustainable education and the Merdeka Curriculum's emphasis on contextual and participatory learning (Retnaningsih & Khairiyah, 2022).

Another crucial point observed was how loose parts play nurtured 21st-century competencies in young learners. Critical thinking, creativity, collaboration, and independence are all developed naturally through exploration-based learning (Rohmah et al., 2023). The open-ended nature of the materials allows children to think divergently, modify their plans, and evaluate outcomes. These cognitive habits, if cultivated from an early age, form the basis of lifelong learning and adaptability in an ever-changing world.

Teachers also reported that the method allowed them to better understand each child's unique personality, interests, and learning style. Some children preferred symmetrical designs; others enjoyed creating abstract combinations of textures and colors. These insights enabled teachers to tailor activities and offer differentiated support without the constraints of a one-size-fits-all approach. This adaptability reflects the goals of inclusive early education and developmentally appropriate practice (Rozak, 2021).

In sum, the findings of this study support the conclusion that the use of loose parts media significantly enhances not only fine motor skills but also social-emotional growth, cognitive development, and classroom engagement. Children showed improvements in coordination, persistence, confidence, communication, and creativity. The strategy also allowed for teacher flexibility, parental involvement, and curriculum integration all contributing to a holistic learning environment (Lestari et al., 2022).

This aligns with international findings that recommend play-based, open-ended approaches as best practices in early childhood education (Simoncini & Meeuwissen, 2024). By supporting multiple domains of development simultaneously, loose parts media proves to be an effective,

sustainable, and inclusive learning tool that prepares young children for future academic and life success.

4. CONCLUSION

The research conducted at RA Sakila Kerti demonstrates that the use of loose parts media is an effective approach to enhancing the fine motor skills of 4–5 year old children. Initially, many children encountered difficulties with tasks requiring hand strength and coordination, such as gluing, cutting, or stringing. Through engaging, flexible, and exploratory loose parts activities such as arranging bottle caps, building with natural materials, and creating collages children showed significant improvements in hand-eye coordination, independence, persistence, and creativity (Simoncini & Meeuwissen, 2024; Putro et al., 2024). The learning process also fostered social-emotional development, including cooperation, sharing, and communication skills.

This method aligns with the principles of the Independent Curriculum, emphasizing contextual learning, critical thinking, and child-centered approaches (Retnaningsih & Khairiyah, 2022). However, the study faced limitations, such as a small sample size limited to one class, and the short observation period, which may not capture long-term developmental outcomes. Additionally, challenges included varying levels of parental involvement and the initial unfamiliarity of teachers with the loose parts approach. Future research should consider larger, longitudinal studies and broader institutional contexts to validate and expand upon these findings. Nonetheless, this study offers valuable insight into how innovative, play-based strategies can support holistic child development in early education settings.

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