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Stimulating Creativity in Children Aged 5-6 Years Through the Use of Natural Materials

Andi Ningsi Nabila[1*], Siti Misra Susanti[1], Marwah[1]

[1] Universitas Muhammadiyah Buton, Indonesia
* corresponding author: andinabila111@gmail.com

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ABSTRACT

This study aims to stimulate early childhood creativity through the use of natural materials in educational activities at TK Mulya Mandiri, Wakuli Village, Kapontori District. The background of this research is the low level of children's creativity caused by limited variation in learning media and minimal use of the surrounding environment as a learning resource. A qualitative approach with Participatory Action Research (PAR) was employed, conducted in two cycles consisting of planning, action implementation, observation, and reflection. Subjects were early childhood students at TK Mulya Mandiri. Data collection techniques included observation, interviews, documentation, and field notes, with descriptive qualitative data analysis. Results show that using natural materials in learning activities improves children's creativity. Activities included stringing natural materials, collages from leaves and seeds, ecoprint, leaf spraying, stamp art using potatoes, and butterfly mosaics from flowers. These activities made children more active, creative, and enthusiastic. Improvement was seen in indicators of fluency, flexibility, originality, and elaboration. In Cycle I, most children were in the "starting to develop" category, while in Cycle II, the majority reached "developing as expected" and "very well developed" categories. Thus, using natural materials is effective in stimulating early childhood creativity and can serve as a reference for teachers in developing creative and innovative learning.

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1. Introduction

Early Childhood Education (PAUD) is a foundational stage that shapes children's holistic development, including cognitive, social-emotional, language, and creative aspects (Marwah, 2022). PAUD serves as the main foundation for building children's future character and abilities (Mulyasa, 2020). Young children are unique individuals whose potential development is highly influenced by environmental stimulation, especially brain development as the center of learning activity (Henny et al., 2023). The early years are known as the golden age, a period highly sensitive to environmental stimuli that determines subsequent development (Hurlock, 2020). An appropriate environment will have long-term positive impacts on the quality of children's development (Rahman, 2023). During this period, children experience rapid growth in all developmental aspects: physical-motor, cognitive, language, social-emotional, and creativity (S. Suyanto, 2021). Young children learn through play, exploration, and direct experience with their surroundings. They have high curiosity and strong imagination in exploring the environment, and they tend to imitate the behavior of adults around them (Suyadi, 2021). Therefore, learning must be designed

actively, creatively, and contextually according to children's developmental needs (Rahmawati, 2023).

In today's digital era, children tend to spend more time using gadgets than engaging in physical play and environmental exploration (Amanda et al., 2020). This condition has an impact on decreasing concentration, social interaction, and creativity. Yet creativity is an important ability that must be stimulated from an early age. Children's creativity will develop optimally if given active, enjoyable, and meaningful learning experiences (Putri & Hasanah, 2022). Stimulation for young children is the provision of planned and conscious stimuli to optimize all aspects of child development (Woga & Juita, 2023). Stimulation includes cognitive, language, motor, social, and emotional aspects (Illiyyin & Ruhaena, 2024). The early years are the golden age because the brain is highly responsive to environmental stimuli (WHO, 2020). Therefore, appropriate stimulation is very important to provide from an early age (Pangestu, 2025), and consistent stimulation helps children achieve optimal development (Sulistiawati et al., 2023). The purpose of stimulation is to develop all of children's abilities optimally (Woga & Juita, 2023), helping to develop thinking, language, and social skills, as well as supporting children's readiness to enter the next level of education. Good stimulation must be appropriate to the child's developmental stage, and stimulation activities must be enjoyable so that children do not feel pressured (Illiyyin & Ruhaena, 2024).

Creativity in early childhood is an important ability that needs to be developed from an early age (Munandar, 2020). Creativity is the ability to produce new or original ideas or works (Sari & Mulyani, 2021). Creativity develops through divergent thinking processes that allow children to generate many ideas (Widodo, 2023). A supportive environment greatly helps the development of children's creativity, and creativity will also develop if children are given freedom of expression (Nugraha, 2021). One medium that can be used in early childhood learning is natural materials. Natural materials come from the surrounding environment, such as seeds, leaves, and twigs (Aisyiah & Pamungkas, 2023). Using natural materials provides concrete learning experiences for children (Hasanah et al., 2021). Natural materials can also improve children's motor and cognitive skills (Salamah et al., 2025). Additionally, natural materials help children understand concepts through direct experience (Rahardjo, 2021). Besides natural materials, agricultural waste also has great potential as a creative learning medium. Agricultural waste is the remains of agricultural products that can be reused (Sutrisno, 2020). Waste such as straw, rice husks, and seeds have educational value (Kusuma, 2022). This waste can be used in collage and stringing activities (Sari, 2023), and its use can increase children's creativity as well as foster environmental awareness from an early age (Putri, 2023).

In rural areas such as Wakuli Village, Kapontori District, agricultural waste such as rice, corn, and mung beans is abundantly available but has not been optimally utilized in learning. This area has approximately 135 hectares of agricultural land with main commodities of rice, corn, and mung beans. This condition shows great potential that has not been optimized in early childhood learning. These seeds are very suitable for collage and stringing activities because they are safe, easy to obtain, and have variations in shape, color, and texture. This media can stimulate children's creativity, imagination, and fine motor skills (Hasanah et al., 2021). However, in learning practices, the media used are still dominated by textbooks and worksheets, causing limited exploratory experiences for children (Rahmawati, 2023). Moreover, natural materials and agricultural waste have not been maximally utilized because they are still considered to have no educational value (Aulia, 2023). In fact, environment-based learning can increase children's active involvement in the learning process (Wahyuni, 2025). Children can learn more meaningfully through direct interaction with the environment. Therefore, environment-based learning innovation is needed to optimize existing potential (Hidayati, 2021). Thus,

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there is a gap between the available environmental potential and the learning practices that take place. This shows the need for a more contextual, creative, and environment-based learning approach to optimally stimulate early childhood creativity. This approach is expected to sustainably improve the quality of PAUD learning in rural areas.

2. Method

This study uses a qualitative approach with the Participatory Action Research (PAR) method. This approach was chosen because the research not only aims to understand phenomena but also to take real action to improve the quality of early childhood learning through the active involvement of various parties. PAR emphasizes collaboration between researchers, teachers, parents, and the community in all stages of research, namely planning, action implementation, observation, and reflection. In this study, the PAR approach was used to stimulate early childhood creativity through the use of agricultural waste as an educational learning medium. The researcher acted as a facilitator working together with participants in identifying problems, designing solutions, implementing actions, and evaluating results reflectively and sustainably (Rahman, 2023). This collaborative process ensured that the interventions were contextually appropriate and locally relevant.

The research was conducted at TK Mulya Mandiri, Wakuli Village, Kapontori District, Buton Regency. The location was chosen based on environmental conditions dominated by agricultural activities and the availability of agricultural waste such as rice, corn, and mung beans that have potential to be used as creative learning media. Learning activities were carried out in the school environment using seeds as the main material in collage and stringing activities. Children's creativity was observed based on four main indicators: fluency (kelancaran), flexibility (keluwesan), originality (orisinalitas), and elaboration (elaborasi). Fluency was seen from the speed and smoothness of children in selecting materials, flexibility from the ability to vary the use of materials, originality from the uniqueness of children's work, and elaboration from the ability to refine and explain their work. The research was conducted through four stages: planning, action, observation, and reflection. In the planning stage, researchers and teachers developed agricultural waste-based learning activities and prepared creativity observation instruments. In the implementation stage, children were given opportunities to explore using seeds through collage and stringing activities to stimulate creativity.

The observation stage was carried out by observing children's behavior and work based on creativity indicators using observation sheets, field notes, and documentation. Furthermore, the reflection stage was conducted through discussion between the researcher and teacher to evaluate activity results, identify obstacles, and plan improvements for the next cycle. The unit of analysis in this study was early childhood creativity as seen through children's activities, ideas, and work in agricultural waste-based educational activities. In addition, the learning process involving teachers and the community was also part of the unit of analysis to see participatory involvement in learning. Data sources consisted of primary and secondary data. Primary data were obtained from children, teachers, and the community through observation, interviews, and documentation, while secondary data came from curriculum documents, lesson plans, and other supporting literature. Data collection techniques included observation, semi-structured interviews, documentation, and field notes. Observation was used to observe children's activities, interviews to explore the views of teachers and the community, documentation to record activity results, and field notes to record important events during the research. The research instruments included child creativity observation sheets, child activity sheets, interview guides, documentation, and field notes. Data validity was maintained through source triangulation, technique triangulation, and extended researcher participation in the field. Data analysis was carried

out descriptively qualitatively through the stages of data reduction, data presentation, and conclusion drawing carried out continuously during the research process (Miles, Huberman, & Saldaña, 2020).

3. Result and Discussion

Result

The implementation of natural material-based learning at TK Mulya Mandiri was carried out through educational activities such as environmental observation, stringing (*meronce*), collage, ecoprint, leaf spraying technique (*percik daun*), stamp art using potatoes, and butterfly mosaic from flowers. These activities provided direct learning experiences (learning by doing) that allowed children to interact concretely with their surroundings. In the initial stage, children showed increased sensory sensitivity to shapes, colors, and sounds. Furthermore, through stringing and collage activities, children experienced development in fine motor skills, hand-eye coordination, and the ability to work independently. Activities such as ecoprint and mosaic were able to stimulate children's creativity and imagination, as seen from the diversity of the works produced. Children not only followed the teacher's instructions but also began to develop ideas independently. This shows that natural material-based learning can create an active, enjoyable, and meaningful learning atmosphere. Pedagogically, the teacher acted as a facilitator who provided stimulus and space for exploration, making learning child-centered. The following table summarizes the key findings from both cycles.

Table 1. Comparison of Children's Creativity Development between Cycle I and Cycle II

Creativity Indicator	Cycle I (Starting to Develop)	Cycle I (Developing as Expected)	Cycle II (Developing as Expected)	Cycle II (Very Well Developed)
Fluency	65%	20%	15%	70%
Flexibility	60%	25%	10%	75%
Originality	70%	15%	20%	65%
Elaboration	55%	30%	25%	60%

In Cycle I, most children were still in the "starting to develop" category for all indicators. For fluency, 65% of children were still hesitant and needed teacher guidance; for flexibility, 60% had difficulty varying materials; for originality, 70% produced works similar to the teacher's example; and for elaboration, 55% could not explain or refine their work. However, after implementing improvements in Cycle II—such as providing more varied materials, giving children more freedom to explore, and offering individualized encouragement—significant improvements were observed. In Cycle II, 70% of children achieved "very well developed" in fluency, 75% in flexibility, 65% in originality, and 60% in elaboration. The remaining children were mostly in the "developing as expected" category, with very few still at lower levels.

The increase in creativity was accompanied by increased child activity and enthusiasm. Children became more actively involved in each activity, dared to ask questions, and worked cooperatively with peers. They also demonstrated intrinsic motivation, continuing to explore natural materials even outside of structured learning time. Some children brought natural materials from home to create their own collages and stringing works. This indicates that learning was contextual and sustainable, transferring from school to home environments. Observations also recorded that children who were previously passive and reluctant to participate became more confident and expressive after several sessions of natural material activities. The variety of works produced was remarkable, including

collages of animals and plants from seeds, necklaces and bracelets from stringed beans, ecoprint fabrics with unique leaf patterns, and butterfly mosaics from colorful flower petals. Each child's work had unique characteristics, reflecting their individual imagination and creative process.

Despite the overall success, several challenges were encountered during implementation. Limited availability of certain natural materials during specific seasons required teachers to prepare alternatives or store materials in advance. Some parents were initially less involved because they did not understand the educational value of natural materials, but after explanation and demonstration, they became more supportive. A few children needed more intensive guidance, especially those with less prior exposure to hands-on activities. Nevertheless, teachers overcame these challenges through adaptive strategies: involving children in collecting materials (which became an additional learning experience), conducting mini-workshops for parents, and providing differentiated instruction for children with varying readiness levels. By the end of Cycle II, the classroom atmosphere had transformed into a more joyful, exploratory, and creative environment.

Table 2. Types of Natural Material Activities and Their Impact on Creativity Indicators

Activity	Materials Used	Creativity Indicators Stimulated	Observed Impact
Stringing (*Meronce*)	Dried beans, corn kernels, seeds, twine	Fine motor, fluency, elaboration	Children created necklaces/bracelets with patterns; improved hand coordination
Collage	Rice grains, mung beans, corn, leaves, glue	Originality, flexibility	Unique animal/shape compositions; varied material combinations
Ecoprint	Leaves, flowers, fabric, mallets	Originality, elaboration	Distinct leaf/fabric patterns; children explained their design process
Leaf Spraying	Leaves, paper, spray paint	Fluency, flexibility	Fast production of varied leaf silhouettes
Stamp Art	Potatoes, paint, paper	Fluency, originality	Children carved stamps independently; created repeated patterns
Butterfly Mosaic	Flower petals, glue, butterfly template	Elaboration, flexibility	Detailed decoration; children chose petal colors and arrangements

Discussion

The aim of this study was to stimulate early childhood creativity through the use of natural materials in educational activities, and the results demonstrate that such an approach is highly effective. The findings show that natural material-based learning not only increases children's creativity but also enhances their active participation, enthusiasm, and intrinsic motivation. This aligns with the theoretical framework that young children learn best through direct, concrete, and enjoyable experiences (Suyanto, 2021). The significant improvement from Cycle I to Cycle II, particularly in fluency, flexibility, originality, and elaboration, confirms that providing varied natural materials and freedom of expression allows children to develop divergent thinking skills. This is consistent with Munandar (2020), who emphasized that creativity flourishes when children are given opportunities to explore and experiment without excessive restrictions.

The success of the intervention can be attributed to several key factors. First, natural materials are readily available, low-cost, and safe for young children, making them highly

accessible for rural PAUD institutions (Aisyiah & Pamungkas, 2023). Second, activities such as stringing, collage, ecoprint, and mosaic are inherently multisensory, engaging children's tactile, visual, and even olfactory senses, which strengthens neural connections and supports cognitive development (Hasanah et al., 2021; Salamah et al., 2025). Third, the child-centered approach, where teachers acted as facilitators rather than directors, gave children the autonomy to make choices, solve problems, and express their unique ideas. This finding supports Widodo (2023), who argued that teacher strategies that prioritize exploration and innovation significantly boost creativity in early childhood. The observed increase in children's ability to explain their work (elaboration) is particularly notable, as it indicates the integration of language and cognitive skills alongside creative expression (Marwah, 2022).

Comparing the results with previous studies, this research reinforces the conclusions of Hidayati & Suyadi (2020), who found that environment-based learning effectively increases creativity through direct experience. Similarly, Lestari & nd Nurhayati (2021) reported that using natural materials increases engagement and learning outcomes in early childhood. However, this study adds a novel contribution by specifically focusing on agricultural waste (rice, corn, mung beans) in a rural farming community, demonstrating that local resources can be transformed into powerful educational tools. Unlike studies that used generic natural materials (e.g., leaves, twigs), the use of agricultural seeds provided additional learning opportunities about local agriculture, sustainability, and environmental stewardship (Putri, 2023; Sutrisno, 2020). This contextual relevance likely contributed to the high level of child enthusiasm and the transfer of learning to home environments, as children began collecting and using natural materials independently.

The increase in children's active participation and cooperative behavior observed in this study is consistent with Rahma & Wahyuni (2022), who stated that environment-based learning increases both creativity and activeness. Yuliana & Hartati (2023) also found that natural material-based activities significantly influence imagination and creativity development in early childhood. The present study extends these findings by providing detailed observational data on four specific creativity indicators and by demonstrating a clear cycle of improvement through participatory action research. The collaborative nature of PAR, involving teachers, parents, and the community, was crucial to the intervention's success (Rahman, 2023). Teachers played a central role in designing and adapting activities, parents supported by providing materials and reinforcing learning at home, and the community contributed by allowing children to collect agricultural waste from local fields. This multi-stakeholder engagement created a supportive ecosystem that sustained the intervention beyond the research period.

Challenges encountered, such as seasonal material scarcity and varying parental involvement, were addressed through adaptive strategies. Teachers learned to dry and store seeds during harvest seasons and to involve parents through short workshops and demonstrations. This finding highlights the importance of teacher creativity and flexibility, as noted by Fauziah & Rahman (2020), who emphasized that teacher roles are critical in environment-based learning. Moreover, Mulyani & Fitriani (2022) argued that collaboration between schools and families is essential for improving the quality of early childhood learning, a conclusion strongly supported by this study. When parents understood the educational value of natural materials—seeing their children's joy and creative output—they became active partners rather than passive observers.

The implications of this study are significant for PAUD practitioners, especially in rural areas. First, teachers should be encouraged to look around their immediate environment for low-cost, high-impact learning media. Agricultural waste, leaves, stones, and other natural objects are often overlooked but can be transformed into rich learning resources. Second,

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learning activities should prioritize process over product. In this study, the value was not merely in the final collage or necklace but in the exploration, problem-solving, and creative decision-making that occurred during the activity. Third, parental involvement can be fostered by demonstrating the value of natural material activities and inviting parents to participate in material collection or even in classroom activities. Fourth, the PAR approach itself offers a model for continuous improvement: teachers and researchers can collaborate to identify problems, implement interventions, observe results, and reflect on improvements in iterative cycles.

Future research should explore the long-term effects of natural material-based learning on creativity and other developmental domains, using longitudinal designs. Comparative studies could examine whether natural materials are more effective than manufactured art supplies for specific aspects of creativity. Additionally, research could investigate how digital technology might be integrated with natural material activities—for example, using tablets to document and share children's creative processes or to explore images of nature that inspire new creations. Finally, cross-cultural studies could examine how different local environments (coastal, mountain, urban) offer unique natural materials that can be leveraged for creativity stimulation.

In summary, this study provides robust evidence that natural material-based learning is an effective, affordable, and contextually appropriate strategy for stimulating creativity in children aged 5-6 years. The participatory action research approach ensured that the intervention was responsive to local conditions and that improvements were sustained across cycles. The four indicators of creativity—fluency, flexibility, originality, and elaboration—all showed significant improvement, with most children reaching "developing as expected" or "very well developed" categories by Cycle II. The findings contribute to the growing body of literature on environment-based early childhood education and offer practical guidance for teachers seeking to move beyond conventional media such as worksheets and textbooks.

4. Conclusion

This study demonstrates that the use of natural materials such as seeds, leaves, and agricultural waste effectively stimulates creativity in early childhood, as evidenced by the significant improvement from Cycle I to Cycle II at TK Mulya Mandiri, Wakuli Village. Children became more active, enthusiastic, and able to produce diverse works through activities such as collage, stringing, ecoprint, leaf spraying, stamp art, and mosaic. The learning process—conducted through material introduction, teacher demonstration, and freedom of expression—allowed children to develop their imagination fully. Teachers acted as facilitators who supported children's creative processes by utilizing the surrounding environment as a learning resource. The four creativity indicators—fluency, flexibility, originality, and elaboration—all showed marked improvement, with most children reaching the "developing as expected" and "very well developed" categories by the end of Cycle II. Challenges such as seasonal material scarcity and initial parental hesitation were overcome through adaptive strategies and active collaboration. In conclusion, natural material-based learning is an effective, low-cost, and contextually appropriate approach for stimulating creativity in young children and can serve as a reference for teachers and PAUD practitioners in developing innovative and meaningful learning activities, particularly in rural areas with abundant environmental resources.

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