

NATURAL MATERIAL COLLAGE AS AN INNOVATIVE STRATEGY TO IMPROVE FINE MOTOR SKILLS AND CREATIVITY OF EARLY CHILDHOOD

Nurrochmah¹

{244120700012@mhs.uinsaizu.ac.id1}

State Islamic University Professor Kiai Haji Saifudin Zuhri, Purwokerto¹

Abstrac. This study aims to analyze the effectiveness of natural material collage activities as an innovative strategy to improve fine motor skills and creativity in early childhood. The research employed a qualitative approach with a classroom action research (CAR) design, following the Kemmis and McTaggart model, which consists of four stages: planning, acting, observing, and reflecting. The study was conducted in two cycles at TK MNU Diponegoro 111 Ajibarang, Banyumas Regency, involving 15 children in Group B (8 boys and 7 girls) during the 2024/2025 academic year. Data were collected through observation, documentation, and teacher reflection. The results showed a significant improvement in children's fine motor abilities and creative expression after the implementation of collage activities using natural materials such as dried leaves, seeds, and eggshells. The average fine motor skill level increased from 47% in the initial observation, to 62% in Cycle I, and 85% in Cycle II, indicating a 38% overall improvement. Children became more skillful in controlling hand and finger movements, more attentive, and increasingly independent in creating their artworks. The findings demonstrate that natural material collage activities not only strengthen fine motor coordination but also foster creativity, concentration, environmental awareness, and self-confidence. Therefore, this learning strategy can be considered an effective, engaging, and environmentally friendly approach to enhancing the quality of early childhood education.

Keywords: natural material collage, fine motor skills, creativity, early childhood education, classroom action research

INTRODUCTION

Early childhood education (ECE) represents a fundamental phase in the developmental process of human life, emphasizing the holistic formation of children's basic competencies across multiple domains religious and moral values, social-emotional development, language, cognition, physical-motor skills, and the arts (Ministry of Education and Culture Regulation No. 137 of 2014). During this period, children experience rapid growth and are highly receptive to learning experiences that shape their future competencies and personalities. Among the various aspects of development, fine motor skills stand out as a crucial foundation that supports children's ability to perform coordinated and precise hand movements (Sujiono, 2017).

Fine motor skills refer to the ability to use small muscles in the hands and fingers to perform tasks that require precision, coordination, and control. These skills play a vital role in preparing children for more complex activities such as writing, drawing, cutting, or manipulating small objects (Hurlock, 2019). When fine motor skills are not adequately stimulated, children may struggle with tasks involving hand control, which could delay their academic readiness and hinder independence in daily routines, such as buttoning clothes or tying shoelaces (Yuliani, 2018). Therefore, it is essential for teachers in early childhood education to design learning activities that are engaging, meaningful, and capable of developing children's hand eye coordination and manual dexterity.

One of the effective and enjoyable activities that can enhance fine motor development is collage making. Collage is an artistic technique that involves sticking a variety of materials onto a surface to create a piece of art (Mayar, 2013). Through collage activities, children are encouraged to use their fingers in diverse ways tearing, pasting, arranging, and pressing which significantly strengthens their fine motor muscles. Beyond motor skill development, collage activities foster creativity,

concentration, patience, and self confidence (Slamet, 2019). They also provide opportunities for children to explore textures, colors, and shapes, thus stimulating sensory experiences and imagination (Alam & Widiastuti, 2020).

In the current era of environmental awareness, the integration of natural materials into learning practices has become an innovative approach that aligns with the principles of contextual and eco friendly education. Utilizing materials such as dried leaves, seeds, egg shells, wood fragments, or sand as collage media can promote environmental consciousness while offering rich sensory experiences for children (Sartika, 2020). Natural materials are not only economical and safe but also introduce children to the diversity of natural resources in their surroundings. This approach nurtures respect for the environment and instills early values of sustainability and creativity (Rohayati, 2021).

Preliminary observations conducted at TK MNU Diponegoro 111 Ajibarang revealed that most children faced challenges in activities requiring fine finger coordination, such as cutting, pasting, and drawing. The learning activities provided by teachers tended to be monotonous, offering limited opportunities for children to practice and refine their fine motor abilities. This situation underscores the need for innovative and stimulating learning strategies that actively engage children in meaningful, hands on experiences. Therefore, implementing collage activities using natural materials is considered a promising alternative to enhance children's fine motor development in an enjoyable and contextually relevant manner.

Accordingly, this study aims to improve the fine motor skills of early childhood learners through natural material collage activities at TK MNU Diponegoro 111 Ajibarang. The study is expected to contribute to the development of creative and environmentally based learning methods that are aligned with the characteristics of early childhood learners. Furthermore, the findings are anticipated to serve as a valuable reference for educators in designing learning activities that integrate art, environment, and skill development to optimize children's holistic growth.

RESEARCH METHOD

This study employed a qualitative approach using the Classroom Action Research (CAR) design. The use of classroom action research was based on the objective to improve and enhance the quality of both the learning process and learning outcomes through reflective, systematic, and collaborative actions between the researcher and the classroom teacher. According to Kemmis and McTaggart (1992), classroom action research is a cyclical process involving a series of planned interventions, observations, and reflections that aim to bring about positive changes in educational practice. In the context of early childhood education, this approach is particularly relevant, as it allows educators to observe children's learning behavior directly, implement interventions that match their developmental needs, and continuously refine teaching practices based on reflective insights.

The research was carried out in two cycles, each consisting of four interrelated phases planning, acting, observing, and reflecting. These iterative cycles were designed to ensure that the actions implemented could be continuously improved in response to observed results and reflections. As emphasized by Arikunto (2019), the action research model is suitable for early childhood education because it enables teachers to analyze their teaching practices, adapt to children's characteristics, and enhance learning through contextual and meaningful experiences.

The study was conducted at TK MNU Diponegoro 111 Ajibarang, located in Banyumas Regency, Central Java. The research subjects were 15 children from Group B (aged 5–6 years) during the 2024/2025 academic year, consisting of eight boys and seven girls. This location was selected based on preliminary observations that revealed challenges among the children in activities involving fine motor coordination, such as cutting, gluing, and drawing. These findings indicated the need for learning innovations that could stimulate fine motor development through enjoyable, hands on activities like collage making using natural materials.

The research was implemented over a two month period, from February to March 2025, encompassing several stages: the pre research phase, which involved initial classroom observation;

the implementation phase, which included two cycles of classroom actions; and the evaluation phase, which analyzed the outcomes of children's participation and progress. Throughout the study, both the researcher and the teacher worked collaboratively to plan, execute, and assess the learning interventions, ensuring the validity and reliability of the findings through triangulation and reflective discussions.

The research procedure followed the model proposed by Kemmis and McTaggart (1992), which emphasizes the interconnection between planning, action, observation, and reflection. In the planning stage, the researcher and teacher designed the Daily Lesson Plans that incorporated collage activities using natural materials such as dried leaves, seeds, and eggshells. Learning tools, media, and observation instruments were prepared to support the implementation and to assess children's fine motor development. During the action stage, the teacher implemented the collage activities according to the lesson plan while the researcher provided assistance and supervision. The children were introduced to various natural materials, encouraged to explore their textures and shapes, and guided to create artworks that reflected their creativity and imagination.

During the observation stage, both the researcher and the teacher systematically monitored children's participation, focusing on indicators such as hand eye coordination, grip strength, precision in pasting materials, and independence in tool use. Observational data were recorded through field notes, photographs, and developmental checklists to capture detailed descriptions of the children's progress. The reflection stage was then conducted collaboratively to analyze the results of each cycle. Reflections centered on identifying the strengths and weaknesses of the implemented actions, determining the extent of improvement in children's fine motor abilities, and formulating adjustments for the next cycle.

The reflective process was essential to the study, as it ensured continuous improvement in instructional design and effectiveness. It also allowed the teacher to develop professional insights into how creative, art based activities such as collage using natural materials could foster not only fine motor development but also creativity, independence, and environmental awareness among young learners. Thus, the cyclical and participatory nature of this classroom action research contributed significantly to the enhancement of teaching practices in early childhood education.

RESULT AND ANALYSIS

1.1 Initial Condition Description

The preliminary observations conducted at TK MNU Diponegoro 111 Ajibarang revealed that the fine motor skills of children in Group B were still underdeveloped. Most of the children displayed limited control of hand and finger movements when performing classroom activities such as cutting, pasting, and drawing. It was observed that the majority of children struggled to hold scissors correctly, tore paper unevenly, or applied glue excessively, indicating a lack of precision and coordination in fine motor control.

Out of the 15 children involved in the study, only 3 children (20%) demonstrated skill levels categorized as *Developing as Expected (DAE)*, while 12 children (80%) were still in the *Beginning to Develop (BD)* or *Not Yet Developing (NYD)* categories. Teachers also reported that children frequently lost focus during fine motor related activities and required continuous guidance to complete simple art tasks.

The main cause of these limitations appeared to be the lack of varied and stimulating learning activities. Daily learning routines mostly consisted of coloring and tracing letters or shapes, which, while beneficial for early literacy, provided insufficient sensory and manipulative stimulation. The absence of activities involving natural, textured, or multi sensory materials limited opportunities for children to strengthen small muscles in their fingers and hands.

Table 1. Initial Condition Description

Category	Description	Number of Children	Percentage (%)
Not Yet Developing (NYD)	Unable to perform collage or fine motor tasks independently.	5	33%
Beginning to Develop (BD)	Attempts to perform tasks but requires significant assistance.	7	47%
Developing as Expected (DAE)	Performs tasks with some degree of control and neatness.	3	20%
Developing Very Well (DVW)	Independent, precise, and creative in execution.	0	0%
Total		15	100%

The mean achievement of fine motor ability during the initial stage was 47%, reflecting that most children were still at a basic developmental level. This finding indicates an urgent need for learning interventions that provide sensorimotor stimulation through activities that are engaging, contextual, and involve direct manipulation of objects.

1.2 Cycle I Results

During Cycle I, the teacher implemented collage making activities using natural materials such as dried leaves, seeds, and small wood fragments. Children were introduced to each material, encouraged to explore their textures, and guided to create simple collage artworks (e.g., flowers, trees, or fruits).

Children's engagement improved visibly during the activity. Most of them appeared curious and enthusiastic while selecting and arranging materials. Their concentration levels increased compared to routine classroom tasks. Furthermore, several children demonstrated progress in their ability to hold glue sticks correctly, apply adhesive more evenly, and paste materials with greater precision.

However, some challenges were also noted. A few children still struggled with delicate materials such as tiny seeds and thin leaf fragments, which required more refined control. Some children became easily distracted or depended heavily on teacher assistance when arranging their compositions.

Table 2. Cycle I Results

Category	Description	Number of Children	Percentage (%)
Not Yet Developing (NYD)	Unable to perform collage tasks independently.	3	20%
Beginning to Develop (BD)	Requires continuous guidance to complete tasks.	6	40%
Developing as Expected (DAE)	Performs tasks with moderate coordination and neatness.	4	27%
Developing Very Well (DVW)	Shows independence, creativity, and accuracy.	2	13%
Total		15	100%

The overall average fine motor skill score increased to 62% in Cycle I, compared to 47% in the initial stage. Although the improvement was moderate, it showed that collage based learning using natural materials successfully initiated fine motor development. Teachers also noted a positive shift in classroom dynamics children became more active, collaborative, and willing to experiment.

1.3 Cycle II Results

Based on the reflection from Cycle I, several adjustments were made in Cycle II to optimize learning effectiveness. The teacher provided clearer verbal instructions, visual examples of collage compositions, and materials in varied sizes to make manipulation easier. Additionally, teachers integrated storytelling and discussion about nature into the lesson to enhance contextual understanding and engagement.

The results of Cycle II indicated a significant improvement in both skill and engagement levels. All children demonstrated higher motivation and independence. They worked more confidently, coordinated their hand movements more effectively, and produced neater, more creative artworks. Moreover, children began assisting their peers voluntarily, showing emerging collaborative learning behavior and social maturity.

Table 3. Cycle II Results

Category	Description	Number of Children	Percentage (%)
Not Yet Developing (NYD)	Unable to perform collage tasks independently.	0	0%
Beginning to Develop (BD)	Needs occasional teacher support.	3	20%
Developing as Expected (DAE)	Demonstrates accuracy and neatness in collage making.	6	40%
Developing Very Well (DVW)	Works independently, creatively, and confidently.	6	40%
Total		15	100%

The mean fine motor ability in Cycle II increased to 85%, representing a 23% rise from Cycle I and a total improvement of 38% from the initial stage. The children's ability to control hand and finger movements, manage tools, and produce visually organized art pieces all showed substantial enhancement. Teachers also observed improved attention span, perseverance, and enthusiasm in learning activities.

1.4 Comparison of Each Stage

The comparison of children's fine motor skill development from the initial observation to Cycle II is summarized below:

Table 4. Stage

Stage	Average Fine Motor Skill (%)	Description
Initial Condition	47%	Children had difficulty controlling hand and finger movements.
Cycle I	62%	Children began developing coordination in using natural materials.
Cycle II	85%	Children could independently create neat and creative collage works.

This progressive trend indicates that the collage activity using natural materials provided effective stimulation for fine motor development in early childhood learners. Each intervention cycle demonstrated measurable improvement in coordination, focus, and creativity.

The results of this research clearly demonstrate that natural material collage activities significantly enhance fine motor development in young children. This finding reinforces the notion that learning through art based, hands on experiences allows children to strengthen small muscle coordination while simultaneously fostering creativity and sensory awareness.

According to Sujiono (2017), fine motor development in early childhood is achieved through repeated use of small muscles in the hands and fingers, particularly through tasks requiring manipulation, precision, and coordination. Collage making inherently involves these elements children must pinch, tear, pick, and paste materials of varying sizes and textures, engaging multiple sensory pathways that stimulate both the muscular and neural aspects of coordination.

Moreover, the activity's tactile and visual dimensions serve as a form of sensorimotor integration, which is vital for cognitive development. The process of planning a design, selecting materials, and arranging them on paper also strengthens executive functions such as planning, sequencing, and attention control (Piaget, 1962; Hurlock, 2019).

In addition to its motor benefits, collage art promotes creativity, concentration, and emotional regulation. As children manipulate natural materials, they learn to make decisions about composition, experiment with shapes and colors, and express personal meaning through their creations. This aligns with Mayar (2013), who emphasizes that collage activities not only develop fine motor skills but also enhance self confidence and independence, as children experience ownership over their artistic outcomes.

The success of the intervention was also strongly influenced by the contextual and environmental nature of the learning approach. By using natural materials readily available in the school surroundings, learning became more meaningful and culturally relevant to the children's experiences. The concept of *learning by doing* (Dewey, 1938) was visibly embodied, where children learned through direct engagement with their environment. This pedagogical approach deepens understanding and supports the development of environmental stewardship from an early age.

Furthermore, Sartika (2020) found that using eco friendly materials in art based learning not only increases children's interest and enjoyment but also nurtures ecological awareness. In the present study, the children became more observant of natural elements, such as leaf shapes, seed textures, and colors, and developed an appreciation for the natural environment as a creative resource.

Another critical aspect highlighted in the reflection process was the role of teacher facilitation. The teacher's clear instructions, modeling, and encouragement significantly influenced the children's level of engagement and performance. The results align with Vygotsky's (1978) theory of the *Zone of Proximal Development (ZPD)*, which suggests that children achieve higher levels of skill when guided by supportive adults or peers. As the study progressed, teacher assistance gradually decreased while children's autonomy increased, reflecting successful scaffolding.

The improvements observed across cycles demonstrate the effectiveness of the action research approach. Through continuous observation, reflection, and modification, the teaching strategy evolved to better meet children's developmental needs. This iterative process aligns with Kemmis and McTaggart's (1992) model, which emphasizes that educational improvement is best achieved through collaborative reflection and responsive practice.

Beyond measurable skill gains, the intervention also contributed to children's social and emotional growth. During the collage sessions, children learned to share materials, discuss ideas, and appreciate one another's artwork. They displayed growing patience, pride in accomplishment, and mutual respect. Such socio emotional outcomes highlight that fine motor activities can also serve as vehicles for character and personality development an important goal of holistic early childhood education (Permendikbud No. 137, 2014).

In summary, the findings of this study indicate that collage activities using natural materials not only enhance fine motor coordination but also stimulate creativity, concentration, environmental awareness, and social interaction. The overall increase of 38% in fine motor development from the baseline to Cycle II demonstrates the strong potential of this strategy as an innovative, contextual, and sustainable learning method in early childhood classrooms.

The implications of this research extend to both pedagogical practice and curriculum development. Teachers are encouraged to integrate art based environmental activities into daily lesson plans, allowing children to learn through play and exploration. Educational policymakers and curriculum designers may also consider including eco art learning models as part of national early childhood education standards to foster motor, cognitive, and ecological competencies simultaneously.

Future research could expand on this study by exploring the long term effects of natural material based activities on writing readiness, creativity scores, and socio emotional adjustment among early learners.

CONCLUSION

Based on the results of the classroom action research conducted through two cycles at TK MNU Diponegoro 111 Ajibarang, it can be concluded that collage activities using natural materials are highly effective in improving the fine motor skills of early childhood learners. The learning intervention succeeded in enhancing children's ability to control hand and finger movements, increasing their precision in pasting materials, and fostering independence and creativity in completing tasks. Quantitatively, the average fine motor skill achievement increased from 47% in the initial condition to 62% in Cycle I, and further to 85% in Cycle II, indicating an overall improvement of 38%. This steady progress demonstrates that the implementation of natural material collage activities provides meaningful sensorimotor stimulation that supports children's physical, cognitive, and emotional development. In addition to improving fine motor coordination, this activity also promotes creativity, focus, confidence, and environmental awareness. By using materials such as dried leaves, seeds, and eggshells, children engage directly with their natural surroundings, learn to appreciate the beauty and diversity of nature, and develop sustainable learning habits. Therefore, it can be concluded that collage making with natural materials represents an innovative, contextual, and environmentally friendly learning strategy suitable for early childhood education. Teachers are encouraged to adopt and adapt this approach as part of their daily learning activities to create engaging, developmentally appropriate, and meaningful educational experiences for young children.

References

- Arikunto, S. (2019). *Prosedur Penelitian: Suatu Pendekatan Praktik*. Jakarta: Rineka Cipta.
- Berk, L. E. (2020). *Child Development* (10th ed.). Boston: Pearson Education.
- Bredenkamp, S., & Copple, C. (2019). *Developmentally Appropriate Practice in Early Childhood Programs* (4th ed.). Washington, DC: National Association for the Education of Young Children (NAEYC).
- Craft, A. (2017). *Creativity and Early Years Education: A Lifewide Foundation*. London: Routledge.
- Depdikbud. (2014). *Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 137 Tahun 2014 tentang Standar Nasional Pendidikan Anak Usia Dini*. Jakarta: Kementerian Pendidikan dan Kebudayaan.
- Erikson, E. H. (2018). *Childhood and Society*. New York: W. W. Norton & Company.
- Hurlock, E. B. (2019). *Child Development* (6th ed.). New York: McGraw Hill.
- Isbell, R., & Raines, S. C. (2017). *Creativity and the Arts with Young Children* (3rd ed.). Belmont, CA: Cengage Learning.
- Kemmis, S., & McTaggart, R. (1992). *The Action Research Planner*. Geelong: Deakin University Press.
- Mayar, F. (2013). *Improving Children's Creativity through Collage Activities in Kindergarten*. *Journal of Early Childhood Education*, 2(1), 45–52.

Morrison, G. S. (2021). *Early Childhood Education Today* (15th ed.). New York: Pearson Education.

Rohayati, S. (2021). *Utilization of Natural Materials in Learning for Early Childhood Education*. *Journal of Educational Innovation*, 9(3), 110–118.

Sartika, D. (2020). *The Use of Natural Materials in Early Childhood Art Learning to Enhance Environmental Awareness*. *Indonesian Journal of Early Childhood Education Studies*, 8(2), 101–110.

Slamet, W. (2019). *Collage Activity as a Media to Improve Fine Motor Skills of Early Childhood*. *Golden Age: Jurnal Pendidikan Anak Usia Dini*, 3(1), 59–68.

Sujiono, Y. N. (2017). *Konsep Dasar Pendidikan Anak Usia Dini*. Jakarta: Indeks.

Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.

Yuliani, S. (2018). *Pengembangan Motorik Halus Anak Usia Dini melalui Kegiatan Kreatif*. Bandung: Alfabeta.

Piaget, J. (1964). *The Child's Conception of the World*. New York: Rowman & Littlefield.

Montessori, M. (2016). *The Absorbent Mind*. New York: Ballantine Books.

Edwards, C., Gandini, L., & Forman, G. (Eds.). (2012). *The Hundred Languages of Children: The Reggio Emilia Experience in Transformation* (3rd ed.). Santa Barbara, CA: Praeger.