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Aesthetic and Educational Functions of 2D Painting on Three-Dimensional Media in Early Childhood Education at PAUD Sabila

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ABSTRACT

Twenty-first-century learning requires teachers to effectively integrate digital technology into the instructional process. Game-Based Learning (GBL) has emerged as a promising pedagogical approach for creating interactive, collaborative, and learner-centered learning experiences. However, studies that specifically map teachers' competencies in implementing GBL remain limited. This study aims to: (1) identify the teacher competencies required for GBL implementation; and (2) analyze the challenges and barriers faced by teachers in implementing GBL. This study employed a Systematic Literature Review (SLR) method guided by the PRISMA 2020 protocol, using two international databases, namely Scopus and ERIC. After the identification, screening, and selection stages based on predetermined inclusion and exclusion criteria, 18 relevant articles were obtained as the main sources of analysis. The thematic synthesis results indicate that teacher competencies in GBL implementation are multidimensional, encompassing four interrelated dimensions: digital pedagogical competence, technological literacy and competence, collaborative and social competence, and creativity and innovation. The Technological Pedagogical and Content Knowledge (TPACK) framework was found to be relevant as an integrative mapping tool that connects technological, pedagogical, and content dimensions in game-based learning implementation. The main challenges identified include low levels of teachers' digital literacy, limited technological infrastructure, and the lack of continuous professional development programs. These findings contribute to the development of teacher training policies and the design of teacher education curricula that are responsive to the demands of the digital era.

Introduction

The global development of early childhood education has shown a paradigm shift from instructional approaches toward learning practices grounded in aesthetic experience and creative exploration. Art education, particularly painting activities, is no longer viewed merely as a recreational activity, but as an essential medium for fostering children's cognitive, emotional, social, and motor development. Recent studies indicate that the integration of visual media, including the exploration of two-dimensional (2D) art within three-dimensional (3D) spaces or media, can enrich children's learning experiences through multisensory and imaginative stimulation (Liu & Wang, 2025; Kalessopoulou & Trouli, 2025). This approach is increasingly relevant in the context of twenty-first-century education, which emphasizes creativity, visual literacy, and critical thinking from an early age.

In Indonesia, the implementation of art education in early childhood education institutions still faces several challenges, particularly in the use of innovative and contextual learning media. Many early childhood education institutions continue to rely on conventional painting activities on paper, without exploring the potential integration of 3D media such as concrete objects, recycled materials, or spatial installations. Previous research has shown that the use of three-dimensional media in art learning can increase children's engagement and strengthen their conceptual understanding through direct experience (Citrowati, 2024). This condition reflects a gap between classroom practices and the development of theories and innovations in early childhood art education.

A similar phenomenon was identified during preliminary observations at PAUD Sabila Ponorogo, where painting activities were still dominated by instructional and product-oriented approaches. Teachers tended to provide examples for children to imitate, thereby limiting children's opportunities for aesthetic exploration and creative expression. In addition, the learning media used in art activities remained relatively limited in variety and had not yet optimized the potential of 3D media as a means of creative expression. This finding is consistent with previous studies which argue that overly structured art learning practices may restrict children's creativity and aesthetic expression (Zeng et al., 2025). Therefore, an alternative approach is needed to integrate aesthetic and educational functions more holistically in early childhood art learning.

Theoretically, the aesthetic function in art education refers to children's ability to perceive, appreciate, and express beauty through artistic activities. Meanwhile, the educational function relates to the development of cognitive, fine motor, social-emotional, and symbolic thinking abilities. The integration of these two functions in 2D painting activities using 3D media is believed to create more meaningful learning experiences. Research indicates that the use of innovative media, including spatial and interactive art-based media, can significantly enhance children's aesthetic awareness and creativity (Zhao, 2024; Mosendz et al., 2025). Thus, this approach offers considerable potential for optimizing art learning in early childhood education.

Art education in early childhood is an integral part of children's holistic development, encompassing cognitive, affective, and psychomotor domains. Conceptually, art education serves as a medium of creative expression that enables children to communicate their experiences, emotions, and imagination through visual forms (Zulfa, 2023). In the context of early childhood education, painting is not only an aesthetic activity but also a learning tool that supports fine motor development, symbolic ability, creativity, independence, and problem-solving skills. This perspective is aligned with constructivist theory, which emphasizes that children construct knowledge through direct experience and interaction with their environment.

The concept of aesthetics in early childhood art learning is closely related to sensory experiences obtained through the exploration of colors, shapes, textures, and space. Rich aesthetic experiences can enhance children's artistic sensitivity and strengthen their imagination (Sistiarini & Setiani, 2025). At the same time, the educational value of art lies in the learning process embedded in artistic creation, such as exploration, decision-making, collaboration, and self-expression. Therefore, the integration of aesthetic and educational functions becomes an important foundation for designing meaningful art learning experiences in early childhood education.

In terms of learning media, the use of three-dimensional media in painting activities offers a more concrete and interactive learning experience than conventional two-dimensional media. Three-dimensional media allow children to interact directly with real objects, thereby enriching their visual, tactile, and spatial perceptions. Studies have shown that spatial and object-based media can increase children's engagement and strengthen conceptual understanding through multisensory experiences (Liu & Wang, 2025). Accordingly, the integration of 2D painting into 3D media can be understood as a pedagogical innovation that combines visual exploration with physical and spatial experience.

Operationally, the aesthetic function in this study refers to children's ability to express beauty, use colors and forms creatively, and demonstrate emotional responses to artworks. Meanwhile, the educational function includes the development of fine motor skills, creativity, symbolic thinking, and social interaction during the learning process. These two functions are interrelated and together shape a holistic learning experience. This perspective is also supported by child development theory, which states that effective learning occurs when children are actively engaged emotionally, cognitively, and physically in meaningful activities.

Several previous studies support the importance of integrating art with innovative media in early childhood learning. Citrowati (2024) found that the use of recycled materials as art media can enhance children's creativity and aesthetic values through the exploration of three-dimensional forms. Zhao (2024) revealed that virtual reality-based technology in art learning can significantly improve children's aesthetic awareness and creativity. Similarly, Zeng et al. (2025) showed that interactive media in art learning can increase children's engagement and confidence in self-expression. These studies demonstrate that media innovation plays an important role in enriching children's art learning experiences.

Nevertheless, studies on the implementation of 2D painting on 3D media in early childhood education, particularly in the Indonesian context, remain limited. Most existing studies tend to focus on digital technology or virtual media in art education (Chen & Gao, 2025), while the exploration of physical, contextual, and environmentally based 3D media has received less scholarly attention. Moreover, qualitative studies that deeply examine children's aesthetic and educational experiences, meanings, and learning processes in this context are still scarce. This gap highlights the need for research that investigates the dynamics of early childhood art learning practices in a more contextual and in-depth manner.

Based on the background above, this study aims to examine the aesthetic and educational functions of 2D painting on 3D media in early childhood art learning, using PAUD Sabila Ponorogo as a case study. The focus of this study includes the learning process, the experiences of children and teachers, and the meanings constructed through the practice. This study is expected to provide theoretical contributions to the development of early childhood art education studies through a qualitative approach, as well as practical contributions for early childhood educators in designing art learning activities that are more innovative, contextual, and meaningful.

The conceptual framework of this study is grounded in the integration of art education theory, aesthetics, and experiential learning. In this framework, 2D painting on 3D media is positioned as the central learning activity that facilitates the emergence of aesthetic and educational functions in early childhood art learning. A qualitative approach is employed to explore the experiences, processes, and meanings constructed through the interaction among children, teachers, and learning media. Therefore, this theoretical foundation serves as the basis for analyzing early childhood art learning as a contextual, creative, and meaningful educational phenomenon.

Research Design and Methodology

This study employed a qualitative approach with a case study design to gain an in-depth understanding of two-dimensional painting activities conducted on three-dimensional media at PAUD Sabila Ponorogo. This approach was selected because it enables the researcher to examine the phenomenon holistically and contextually within a real-life educational setting, thereby revealing the experiences, interactions, and meanings that emerge during the learning process (Mugwe & Runo, 2026; Agilan, 2026). The study was conducted during the even semester of the 2025/2026 academic year over approximately three months. The research participants included classroom teachers, the school principal, and young learners involved in painting activities using 3D media. Informants were selected through purposive sampling based on predetermined criteria, supported by snowball sampling to obtain additional data from relevant parties, such as parents, in order to enrich the research findings (Fikri, 2026).

Table 1. Data Collection Techniques

Technique	Data Sources	Purpose	Instrument	Indicators
Semi-structured interviews	Teachers, school principal, parents	To explore perceptions, experiences, and meanings related to the learning process	Interview guidelines	**Aesthetic Function:** visual sensitivity; exploration of colors and shapes; imaginative expression; appreciation of beauty; artistic freedom; aesthetic satisfaction. **Educational Function:** fine motor skills; cognitive development; creativity; social development; emotional development; language and communication; problem-solving.
Participatory observation	Learning activities	To observe children's behavior, interactions, and creative processes	Observation sheet	Aesthetic and educational indicators observed during the learning process
Documentation	Children's artwork, photographs, videos, and daily lesson plans	To support and verify field data	Camera and document archives	Learning products, classroom activities, and instructional documents

Field notes	Classroom situations	To record reflections and contextual phenomena	Field notes	Classroom dynamics, researcher reflections, and contextual findings

Data collection techniques in this study consisted of semi-structured interviews, participatory observation, documentation, and field notes. The interviews were conducted flexibly using open-ended questions to explore teachers' experiences and their perceptions of the aesthetic and educational functions of painting activities. Participatory observation was carried out through the researcher's direct involvement in the learning process, enabling the observation of children's interactions, the use of learning media, and classroom dynamics in a natural setting. Meanwhile, documentation, including children's artwork, activity photographs, learning documents, videos, and field notes, was used to strengthen and verify the research data.

Data trustworthiness was ensured through source and method triangulation by comparing information obtained from various informants and data collection techniques (Rusitayanti et al., 2026). In addition, member checking was conducted to confirm the accuracy of interview results and data interpretation with the informants (Helita et al., 2026). An audit trail was also maintained to document the entire research process systematically, thereby enhancing the transparency and reliability of the study (Agilan, 2026). Furthermore, peer debriefing was applied to minimize potential researcher subjectivity during the research process.

The data were analyzed using the interactive model of Miles, Huberman, and Saldaña, which consists of data reduction, data display, and conclusion drawing (Sari et al., 2026). The collected data were selected, organized, and categorized according to the research themes, then presented in the form of descriptive narratives to facilitate interpretation. Data analysis was conducted simultaneously with data collection, allowing the researcher to deepen the interpretation, refine emerging themes, and ensure that the findings were established systematically and contextually.

Findings and Discussion

Findings

A. Observation Results

Based on observations made during learning activities at PAUD, children appeared very enthusiastic when participating in two-dimensional painting activities on three-dimensional media such as piggy banks, used bottles, and simple vases. Before the activity began, the teacher first introduced the tools and materials that would be used, then gave examples of how to hold a brush, mix colors, and basic painting techniques on the surface of the object. The children seemed to pay close attention to the teacher's explanation and showed a high level of curiosity about the media used because its shape was different from the paper media they usually use in art lessons. As the activity progressed, the children began to explore various colors, shapes, and patterns according to their respective imaginations so that the classroom atmosphere looked active and fun.

During the learning process, some children still experienced difficulties when painting on curved or uneven surfaces. However, the teacher provided gradual guidance by helping to guide the position of the hand and how to control the brush so that the children could still complete their work well. In addition to fostering creativity and aesthetic abilities, this activity also demonstrated the development of fine motor skills, concentration, and self-confidence in children. This was evident when the children were able to complete their own paintings and were brave enough to show and share their work in front of their friends and teachers in class. Thus, the activity of painting two dimensions on three-dimensional media not only provides a fun learning experience but also supports the development of children's overall abilities.

B. Interview Results

Based on the results of interviews conducted with teachers, the principal, and parents of students, information was obtained that two-dimensional painting activities on three-dimensional media have a significant aesthetic and educational function for the development of early childhood. The class teacher, Mrs. Siti Aminah, said that "children appear more creative and brave in expressing their ideas when painting on media such as piggy banks or bottles because they find the activity more interesting than drawing on plain paper." In addition, she also explained that the activity can help the development of children's fine motor skills through the activity of holding a brush, mixing colors, and adjusting the direction of strokes on the surface of the object. The principal, Mrs. Rina Wulandari, also explained that "learning art using three-dimensional media provides a more concrete and enjoyable learning experience because children can directly interact with real objects." According to her, this activity can also create an active learning atmosphere and encourage children to be more confident in showing their work.

Meanwhile, interviews with parents showed positive changes in children's behavior and interest in art activities after participating in the learning. One of the parents, Mrs. Dewi Lestari, stated that "my child has become more enthusiastic about learning art at home and often tries to mix colors himself after participating in painting activities at school." She also revealed that the child seemed more confident when showing his work to his family and began to be interested in paying attention to the colors and shapes of objects in the surrounding environment. A similar opinion was expressed by Mr. Ahmad Fauzi who said that "painting activities in three-dimensional media make children more patient and focused when completing their work." Based on the interview results, it can be concluded that two-dimensional painting activities in three-dimensional media not only provide aesthetic experiences for children, but also play an important role in supporting the development of creativity, fine motor skills, concentration, and self-confidence in early childhood.

C. Documentation

Research documentation shows various two-dimensional painting learning activities on three-dimensional media carried out by children during the learning process in the PAUD class. Based on the documentation in the form of photos, children are seen preparing tools and materials such as brushes, colored paint, palettes, and three-dimensional media such as piggy banks, bottles, and simple vases that will be used in painting activities. The documentation also shows the teacher providing directions and examples of basic painting techniques before the children begin to work independently. During the learning process, children appear to be actively exploring colors, shapes, and patterns according to their respective imaginations, so that the classroom atmosphere looks fun and full of creativity.

In addition to documentation of the learning process, there is also documentation of children's work in the form of three-dimensional objects decorated using various color combinations and simple motifs. The results of this work show that each child has a different creativity and character in expressing ideas through art media. The documentation also shows the children's expressions of pride and confidence when showing their work to teachers and friends in class. Through this documentation, it can be seen that two-dimensional painting activities on three-dimensional media take place actively, creatively, and are able to provide direct learning experiences that support the development of aesthetic skills, fine motor skills, and courage to express themselves in early childhood.

Figure 1. 2D Painting Activity on 3D Media.

D. Field Notes Results

Based on field notes during the research, the classroom learning atmosphere appeared conducive, active, and enjoyable. Children showed a high level of curiosity about the two-dimensional painting activity on three-dimensional media because the media used was different from usual. Most children seemed more interested in painting on objects such as piggy banks, bottles, and vases than on regular paper media because they could hold, rotate, and decorate the objects directly. At the beginning of the activity, several children appeared enthusiastic about choosing paint colors and trying out various simple patterns according to their imagination. The teacher also appeared active in providing direction and helping children understand how to use a brush and mix colors correctly so that the learning activity took place more focused.

During the learning process, several obstacles were encountered by the children, such as difficulty controlling the brush on curved surfaces and paint that easily spilled when used. Some children also appeared hesitant when decorating certain parts of three- dimensional objects because the surface was uneven. However, the teacher provided guidance and assistance gradually so that the children were still able to complete the activity well. The interaction between the teacher and the children was active through questions and answers and motivation throughout the painting process. At the end of the activity, the children appeared proud and confident when showing their work to the teacher and their classmates. This shows that two-dimensional painting activities on three-dimensional media not only provide aesthetic experiences but also train children's concentration, patience, creativity, and courage in expressing themselves.

Discussion

A. Aesthetic Function

1. Visual Sensitivity

The development of visual sensitivity in children indicates that 2D painting activities on 3D media can expand children's abilities to recognize, differentiate, and respond to visual elements such as color, line, texture, and proportion. Three-dimensional media provides a more complex visual experience than flat surfaces because children are confronted with surfaces that have angles, curves, and spatial dimensions. This encourages children to make more careful observations before acting. Theoretically, the development of visual sensitivity is the initial foundation for visual literacy and art appreciation. These findings reinforce the idea that art learning based on concrete experiences can

stimulate children's perceptual abilities more effectively. Practical implications: teachers need to provide a variety of visually rich media to stimulate children's observational acuity. Future research can examine the relationship between visual sensitivity and the development of visual-spatial thinking skills in early childhood (Xiao et al., 2025; Rissanen, 2025).

2. Exploration of Color and Shape

Exploration of color and shape is central to children's artistic experiences. In the context of this study, 3D media allows children to understand that color and shape are not only present on a flat surface but can also interact with volume and space. Children learn that color selection can produce certain visual effects, while the placement of shapes on curved surfaces requires adjustments in artistic strategies. From an aesthetic theory perspective, this exploration is a process of forming early artistic understanding. Practically, teachers need to facilitate freedom of exploration without limiting outcomes to uniform patterns. These findings also indicate that overly structured art instruction has the potential to hinder children's visual creativity. Further research could examine how material variations influence children's aesthetic preferences (Lee & Liu, 2025; Wang et al., 2025).

3. Imaginative Expression

Imaginative expression emerges when children transform ordinary objects into meaningful symbols. Flower pots can become fairy houses, cardboard boxes can become fantasy vehicles, and used bottles can become imaginary characters. This process demonstrates that art serves as a medium for representing children's inner worlds. From a constructivist perspective, imagination is a child's primary means of constructing meaning and understanding reality. These findings confirm that 3D media enriches children's symbolic space by providing more concrete and manipulative experiences. The theoretical implication is that imagination does not develop abstractly, but rather through interaction with real objects. Practically, teachers need to create environments that support symbolic play and free expression. Future research could explore the relationship between imaginative expression and children's narrative development (Ho et al., 2025; Ruokonen & Lepistö, 2024).

4. Appreciation of Beauty

Children's ability to enjoy, evaluate, and appreciate works of art demonstrates a growing appreciation of beauty. This appreciation is directed not only at their own work but also at the work of their peers. Children begin to demonstrate behaviors such as comparing, admiring, and providing simple comments on visual works. From an aesthetic education perspective, appreciation is a process of internalizing aesthetic values while fostering cultural sensitivity. These findings demonstrate that aesthetic experiences are social in nature, developing through interaction and dialogue. Practical implications suggest that teachers should provide spaces for appreciation, such as class exhibitions or art-sharing sessions. Further research could examine how aesthetic appreciation contributes to the development of empathy and appreciation for diversity (Noyat, 2025; Sun, 2024).

5. Artistic Freedom

Artistic freedom is a key prerequisite for the growth of children's creativity and artistic identity. When teachers act as facilitators, children have autonomy in determining colors, shapes, themes, and creative methods. This freedom allows for the courage to experiment, take creative risks, and develop a personal style. Theoretically, this aligns with a child-centered learning approach that places individual expression at the heart of arts education. Practical implications suggest that teachers need to reduce imitation-oriented learning practices. This study also critiques approaches to art that overemphasize uniformity of results. Future research could examine the influence of artistic freedom on the development of children's creative self-efficacy (Blanco-García & Serrano, 2025; Genet-Verney et al., 2025).

6. Aesthetic Satisfaction

Aesthetic satisfaction is reflected in children's feelings of pride, joy, and emotional attachment to their work. This experience strengthens children's intrinsic motivation to continue creating. Satisfaction does not come solely from the end result, but from the creative process, which involves exploration, success, and reflection. Theoretically, aesthetic satisfaction is closely related to the formation of self-identity and emotional well-being. Practical implications: teachers need to emphasize appreciation for the process, not just the product. This is crucial for building self-

confidence and courage to express themselves. Further research could examine the relationship between aesthetic satisfaction, learning motivation, and children's psychological well-being (Athanasekou et al., 2025; Luo et al., 2025).

B. Educational Function

1. Fine Motor Development

Painting on three-dimensional media presents more complex motor challenges than on flat media. Children must adapt their hand movements to the contours, angles, and textures of the object. This activity strengthens eye-hand coordination, small muscle control, and precision of movement. Theoretically, manipulative experiences like these are essential for sensorimotor development. Practical implications: Teachers can utilize various media to enrich motor stimulation. Further research could compare the effectiveness of 2D and 3D media on the development of children's fine motor skills (Hu & Li, 2025).

2. Cognitive Stimulation

This activity involves complex thought processes, from planning and decision-making to pattern recognition and spatial reasoning. Children must consider appropriate colors, determine the position of images, and adapt the design to the shape of the object. This process demonstrates that art is an effective cognitive learning tool. Theoretically, these findings support the view that artistic activities can integrate symbolic and logical thinking. Practical implications suggest that art should be positioned as a strategic component of the early childhood education curriculum, not simply as an additional activity. Future research could examine the relationship between 3D-based art activities and early mathematical problem-solving skills (Xiao et al., 2025).

3. Strengthening Creativity

Creativity thrives when children are faced with open-ended situations that offer many possible solutions. 3D media provides challenges that encourage divergent, flexible, and original thinking. Each child produces unique work, even when using the same materials. Theoretically, this confirms that creativity thrives through freedom, experimentation, and authentic experiences. Practical implications: teachers need to provide exploratory spaces that don't limit outcomes to a single standard. Further research could explore how media types influence dimensions of creativity, such as fluency, flexibility, originality, and elaboration (Jiang et al., 2025; Han & Piaw, 2025).

4. Social Development

Collaborative painting activities encourage children to share tools, discuss, collaborate, and value each other's ideas. These interactions strengthen social skills, such as communication, empathy, negotiation, and collaboration. From a sociocultural perspective, learning occurs through meaningful social interactions. Practical implications: Teachers can design collaborative art projects to foster collaborative skills. Future research could examine the role of art activities in building an inclusive and cooperative classroom culture (Rodrigues et al., 2025).

5. Emotional Regulation

Art provides a safe space for children to recognize, express, and manage emotions. During the creative process, children learn to face failure, tolerate frustration, and experience satisfaction after completing a task. This activity serves as a means of catharsis and strengthening self-control. Theoretically, art contributes to the development of emotional intelligence and resilience. Practical implications: teachers can use art activities as a social-emotional learning strategy. Further research could explore the influence of art on children's psychological well-being in the school environment (Athanasekou et al., 2025).

6. Language and Communication Development

When children explain their work, choose colors, or discuss it with friends, they naturally develop language skills. Art activities provide an authentic context for expanding vocabulary, enhancing narrative skills, and practicing interpersonal communication. Theoretically, this suggests that language develops optimally in meaningful and contextual situations. Practical implications suggest that teachers should encourage reflective dialogue during and after art activities. Future research

could examine the contribution of art activities to children's early literacy development (Marqués Ibáñez, 2023).

7. Problem Solving Skills

Painting on 3D media presents various technical challenges, such as uneven surfaces, unexpected colors, or limited drawing space. Children learn to identify problems, try alternatives, and evaluate the results. This process strengthens critical and adaptive thinking skills. Theoretically, these findings support the concept that creativity and problem-solving are closely related. Practical implications: teachers should not immediately provide solutions but rather facilitate children's self-discovery. Further research could explore the relationship between artistic experiences and the development of executive functioning in early childhood (Shi, 2025; Olsen, 2024).

C. Aesthetics and Educational 2D Painting on 3D Media at Sabila PAUD

Based on research results at Sabila Early Childhood Education Center (PAUD Sabila), two-dimensional painting activities on three-dimensional media indicate a significant aesthetic function development in early childhood. Children are able to explore colors, shapes, patterns, and textures more freely through the use of media such as piggy banks, bottles, and simple vases that have concrete forms and attract their visual attention. This activity provides a more realistic visual and sensory experience than using flat media such as paper because children can interact directly with areas that have different spaces, volumes, and surfaces. Children appear enthusiastic in choosing colors, mixing paints, and decorating media according to their imaginations, making the creative process more creative and enjoyable. This condition shows that art learning is not only a play activity, but also an important means to foster visual sensitivity, imaginative expression, appreciation of beauty, and aesthetic satisfaction in early childhood through concrete learning experiences. This finding is in line with research by Nur Fajrie et al. (2024) which states that art learning based on concrete materials can enhance children's aesthetic experience through direct interaction with art media, so that children are more active in exploring visual elements in their surroundings.

In addition to its aesthetic function, research at Sabila Early Childhood Education Center (PAUD) also demonstrates the development of educational functions through comprehensive and continuous two-dimensional painting activities on three-dimensional media. Children experience fine motor development when holding a brush, controlling the direction of strokes, and adjusting their hand position on curved surfaces, which requires better coordination and concentration. This activity also stimulates children's cognitive abilities through simple problem-solving processes, such as determining how to decorate all parts of the media so that it looks balanced, attractive, and aligns with their ideas. Furthermore, painting activities provide a space for children to develop creativity, communication skills, and emotional regulation when completing works independently or with peers. Children appear more confident in expressing their ideas and more patient when facing difficulties during the coloring process or pattern arrangement on three-dimensional media. These results are supported by research by Etnawati and Pamungkas (2022), which explains that the use of diverse painting media in art learning can develop multiple intelligence, creativity, and thinking skills in early childhood through active and exploratory learning activities.

Overall, the two-dimensional painting activity on three-dimensional media at Sabila Early Childhood Education can be interpreted as a holistic form of art learning because it is able to integrate aesthetic and educational aspects simultaneously in one learning activity. This learning not only focuses on the final product of the child's work but also emphasizes the importance of the exploration process, direct learning experiences, and the development of various aspects of early childhood abilities in an integrated manner. Children become more confident in expressing ideas, more active in interacting with teachers and friends, and are more interested in participating in art activities because the learning is carried out in a fun and contextual manner. Furthermore, the use of three-dimensional media provides a different learning experience because children can understand shape, space, and texture more realistically than conventional media. The learning process also shows that art activities can be a means of developing character traits such as independence, cooperation, perseverance, and courage in trying new things in early childhood. These findings reinforce Gunada's

(2022) view that art learning in early childhood functions to develop children's creativity, cognitive intelligence, and expressive abilities through active, contextual learning experiences that focus on the child's overall development.

Figure 3 Chart of 2D Painting on 3D Media.

Based on the image, the two-dimensional painting activity on three-dimensional media at Sabila Ponorogo PAUD shows the integration between aesthetic and educational functions in early childhood learning. The aesthetic function is seen through visual sensitivity, exploration of color and shape, imaginative expression, appreciation of beauty, freedom of creation, and aesthetic satisfaction that help children develop artistic experiences and expressive abilities. Meanwhile, the educational function is seen from the development of fine motor skills, cognitive stimulation, creativity, social interaction, emotional control, language and communication skills, and problem-solving skills that support children's overall development. The relationship between these two functions shows that art learning is not only a means of entertainment or creative activity alone, but also plays a role as an effective educational medium in developing children's intellectual, emotional, social, and aesthetic abilities. Therefore, the use of three-dimensional media in painting activities can be a learning innovation that is meaningful, contextual, fun, and centered on the holistic development of early childhood.

Conclusion

This study concludes that the implementation of 2D painting activities on 3D media at Sabila Ponorogo PAUD is able to provide more meaningful, holistic, and child-centered art learning. The main findings show that the use of 3D media not only expands the space for children's aesthetic expression but also strengthens the educational function through multisensory, contextual, and participatory learning experiences. Children show improvements in aspects of creativity, imagination, fine motor skills, and social interaction, all of which develop simultaneously in the learning process.

From a theoretical perspective, this study reinforces the concept of integrating aesthetic and educational functions in early childhood art education, and supports a constructivist approach that places hands-on experience at the heart of learning. The findings also enrich the literature by demonstrating that exploration of simple 3D physical media—not always technology-based—has significant potential for developing children's creativity and engagement, in line with recent research trends in art education that emphasize the importance of immersive and interactive experiences (Xiao et al., 2025; Han & Piaw, 2025).

Practically, the results of this study provide implications for early childhood education (PAUD) teachers in designing more innovative arts learning by utilizing environmental media, such as recycled materials, as a means of creative exploration. The teacher's role as a facilitator is key to creating a

flexible learning environment that supports children's freedom of expression. Furthermore, these findings are also relevant for education policymakers to encourage the development of a PAUD curriculum that is more adaptive to experiential and creativity-based learning approaches.

However, this study is limited by the location and number of participants, which were limited to one PAUD institution. Therefore, future research is recommended to expand the scope of the study to various educational contexts and explore other variations of 3D media, including integration with digital technology, to gain a more comprehensive understanding of the development of early childhood arts learning.

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