

# Eco-Art Diorama as Thematic Learning Media for Early Childhood Education (PAUD)

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## Abstract

This Community Partnership Empowerment Service activity aims to improve the competence of early childhood education (PAUD) teachers in developing eco-art-based thematic learning media through the utilization of used materials. The program was implemented in Aceh Besar Regency using a hands-on training and mentoring approach. The activity methods included partner needs analysis, providing conceptual materials, practicing diorama media creation, and evaluation through pre- and post-activity questionnaires, observations, and product assessments. The results of the activity showed a significant and measurable improvement in teacher competence, as indicated by the increase in average scores from the moderate category (mean 2.5–2.9) to the good–very good category (mean 4.0–4.3). In addition, 88% of the diorama media produced were deemed suitable and effective for use in PAUD thematic learning, and 82% of teachers were able to independently develop eco-art-based learning media, while more than 80% of teachers expressed readiness and commitment to implement them sustainably in the classroom. The impact of sustainability was also seen in the increased independence of teachers as developers of learning media based on local potential, thereby reducing dependence on manufactured media. This indicates that the program not only improved competencies but also strengthened sustainable teaching practices and teacher empowerment. Overall, this activity has an impact on improving the quality of PAUD thematic learning while strengthening the internalization of environmental awareness values from an early age through an eco-art-based teacher empowerment approach.

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## INTRODUCTION

Early childhood education (PAUD) represents the initial stage in the formal education process and plays an important role in shaping children's character, intelligence, and creativity (Rahma, 2025). Learning in PAUD should ideally be thematic, enjoyable, and based on direct and meaningful experiences. Educators must be able to optimally utilize their professional competencies in designing early childhood learning processes (Maretyaningrum, 2019). To design such learning processes, teachers are required to possess creative and innovative ideas in preparing learning designs that utilize environmentally friendly and economically valuable materials, which can function as attractive and appropriate thematic learning media to support the learning process (Ismaniati & Lindra, 2025).

Quality education is essential to ensure the provision of quality educational services for early

childhood learners. One of the primary indicators used to measure the quality of PAUD institutions is accreditation (Badan Akreditasi Nasional Pendidikan Anak Usia Dini dan Pendidikan Nonformal, 2018). Accreditation is a comprehensive evaluation and assessment process of the feasibility and performance of PAUD institutions based on national education standards. Through accreditation, PAUD institutions are assessed on various aspects, including the quality of educators and educational staff, curriculum, facilities and infrastructure, institutional management, and learning processes (Kementerian Pendidikan dan Kebudayaan, 2014). Accreditation results provide an objective description of institutional quality achievement, such as accreditation A (excellent), B (good), and C (adequate). Accreditation functions as a quality measurement tool and as a foundation for institutional guidance, development, and continuous quality improvement.

Based on preliminary observations, field surveys, and interviews with PAUD teachers and representatives of the Kindergarten Teachers Association (IGTKI) in Aceh Besar Regency, the use of learning media in PAUD institutions has not been optimal. More than 65% of teachers still rely on commercially produced learning media, and their ability to develop innovative and environmentally friendly learning materials remains limited. This finding is consistent with previous studies indicating that teachers often lack confidence and skills in developing creative instructional media independently (Putri & Mustakimah, 2025; Sari & Widodo, 2021). In addition, the integration of thematic learning with contextual and environmentally based media has not been fully implemented (Nurlailiyah & Wartini, 2016; Trianto, 2016). These conditions indicate a gap between the expected competencies of teachers and actual practices in the field.

The development of ecoart-based diorama learning media using recycled materials offers an effective and sustainable solution. Such media are not only visually attractive but also support thematic learning and instill environmental awareness values from an early age (Inwood, 2013; Asmara & Wijayanto, 2026).

The integration of ecoart principles into thematic learning is pedagogically relevant because thematic learning emphasizes contextual, meaningful, and experience-based learning, while ecoart encourages the use of real, locally available materials to construct knowledge (Inwood, 2013; Sari et al., 2025). Through this integration, learning becomes more concrete, interactive, and environmentally oriented, enabling children to actively explore their surroundings while developing creativity and ecological awareness (UNESCO, 2017). Therefore, innovation in the form of training and development of diorama media for PAUD teachers is necessary to enable them to create environmentally friendly, economical, and educational learning aids.

Previous community service programs have generally focused either on teacher training or on the separate development of learning media. However, few initiatives have integrated eco-art principles, thematic learning approaches, and teacher empowerment into a single structured program (Chambers, 1997; Darsana et al., 2021). This study addresses this gap by proposing an integrated model that combines eco-art-based diorama media development with participatory training and mentoring for PAUD teachers.

Strengthening teacher competence and mentoring in learning media development is intended to guide PAUD teachers to provide innovative and independent learning that is both effective and efficient. Effectiveness refers to the

utilization of media across various learning centers implemented in schools, while efficiency refers to media designed using natural materials available in the surrounding environment that are durable (Al Qadri & Yoenanto, 2024; Komariyah & Erik, 2025). The importance of teachers ability to design learning media is explicitly mandated in the Regulation of the Minister of National Education No. 16 of 2007 concerning Academic Qualification Standards and Teacher Competencies for PAUD/TK/RA.

Through this Community Partnership Empowerment Program, PAUD teachers are expected to strengthen their knowledge and skills in developing learning media from simple base materials through the utilization of recycled materials, which will also promote environmental awareness among PAUD teachers in the Aceh Besar Regency.

Specifically, this program aims to (1) improve teachers' understanding of thematic learning principles and eco-art concepts, (2) enhance teachers' skills in designing and developing eco-art-based diorama learning media using recycled materials, (3) increase teachers' ability to select safe, educational, and locally available materials, and (4) strengthen teachers' readiness and independence in implementing eco-art-based learning media in classroom practice.

These objectives align with the program's expected measurable outcomes, including increased competency scores, the production of feasible diorama media, and the sustainable implementation of eco-art-based learning approaches in PAUD institutions.

## MATERIALS AND METHODS

### Preparation and Problem Identification

Activities included initial surveys, field observations, and interviews with PAUD teachers and representatives of the PAUD Teachers Association (IGTKI) in Aceh Besar. The objective was to map teachers actual needs related to learning media and institutional readiness, and to produce baseline data for developing relevant training modules and instructional tools.

The needs assessment involved interviews with 10 selected PAUD teachers and two representatives of IGTKI, as well as a survey administered to 70 participating teachers. The interviews were conducted using semi-structured questions focusing on the following: (1) types of learning media currently used in classrooms; (2) challenges faced in developing thematic learning media; (3) experience in using recycled materials; and (4) expectations for training programs.

The survey results indicated that more than 65% of teachers relied on commercially available learning media and had limited experience designing their own instructional materials, particularly those based

on environmentally friendly resources. These findings provide a strong basis for designing targeted intervention programs.

### **Design of Training Modules and Diorama Media**

The team developed training modules and initial designs for eco-art-based diorama learning media using recycled materials. This process involved needs analysis, theme selection aligned with the PAUD curriculum, identification of locally available recycled materials, and the preparation of structured training outlines. The modules were designed to be practical, user-friendly, and adaptable for teachers' use.

The selection of themes was based on the PAUD curriculum and included examples such as "My Environment," "Animals," and "Transportation," which are commonly implemented in thematic learning. Each theme was translated into a diorama prototype that integrated learning objectives, material selection, and safety considerations.

The training modules comprised step-by-step instructions, visual examples of diorama designs, and guidelines for integrating the media into classroom learning activities. These components were intended to ensure that teachers could easily replicate and adapt the media to their respective classroom contexts. To ensure the feasibility and relevance of the modules, the design was internally reviewed by the implementation team and refined based on the initial trials conducted during the workshop sessions.

### **Workshop Implementation and Mentoring**

Face-to-face workshops were conducted to provide participants with hands-on experience in creating diorama media, through demonstrations, direct practice, discussions, supervision, classroom observation, and feedback. The workshops were held on September 25–26, 2025, at the PGRI Building of Aceh Besar Regency, and involved teachers from 70 PAUD institutions.

The workshop was implemented using a structured learning-by-doing approach in which participants were actively engaged in each stage of the activity. Teachers were grouped into small teams to collaboratively design and produce eco-art-based diorama media based on selected thematic topics. During the implementation, facilitators provided continuous guidance through demonstrations, step-by-step instructions, and direct mentoring. Participants were also given opportunities to present their work, receive feedback, and revise their products accordingly.

This participatory approach ensured that teachers not only understood the conceptual aspects of eco-art and thematic learning but also gained practical experience in developing and applying the media in simulated classroom contexts.

### **Evaluation and Reflection**

Data were collected through questionnaires, interviews, and documentation of the classroom implementation. The evaluation aimed to assess the program's impact on improving teacher competencies and learning quality through photographic and video documentation and reflective forums.

The evaluation process employed both quantitative and qualitative approaches to the data analysis. A structured pre- and post-activity questionnaire consisting of 12 items was administered to all the participants ( $n = 70$ ). The questionnaire used a 5-point Likert scale (1 = very low, 5 = very high) and measured four main aspects: (1) understanding of thematic learning principles, (2) knowledge of eco-art concepts, (3) skills in designing diorama learning media, and (4) confidence in implementing media in classroom practice. In addition to the questionnaires, participant performance during the workshop was observed using an observation checklist focusing on participation, collaboration, and practical skills in media creation.

The diorama products created by the participants were evaluated using a rubric based on three main criteria: (1) pedagogical suitability (alignment with learning objectives), (2) aesthetic quality (creativity and visual appeal), and (3) safety aspects (use of child-friendly materials). Each criterion was assessed on a scale of 1–5.

The product assessment was conducted by the facilitation team and further reviewed by an external expert in early childhood education to ensure the objectivity and reliability of the evaluation. Qualitative data from observations, interviews, and reflective discussions were analyzed to identify patterns in participant engagement, challenges encountered, and the program's overall impact.

## **RESULTS AND DISCUSSION**

### **Program Implementation and General Outcomes**

The implementation of the program demonstrated measurable improvements in teachers' competencies and active participation. Attendance and engagement rates exceeded 90%, indicating strong relevance between program objectives and partner needs. Evaluation results from the pre- and post-activity questionnaires showed a significant increase in teachers' understanding of PAUD thematic learning principles and eco-art concepts.

The program involved 70 PAUD teachers, with an attendance rate of 92.8%, indicating a high level of participation and commitment. Observational data showed that more than 85% of the participants demonstrated active engagement during the workshop sessions, particularly in hands-on activities involving diorama creation.

Prior to the program, teachers average understanding was categorized as moderate (average score <70). After participating in the workshops and mentoring sessions, the average scores increased to the good–very good categories (average score >80). These improvements were particularly evident in teachers abilities to identify safe recycled materials, design thematic diorama media, and integrate the media into classroom learning scenarios. More specifically, the improvement in teachers' competencies was reflected in the increase of mean scores from 2.5–2.9 (moderate level) in the pre-test to 4.0–4.3 (good–very good level) in the post-test, indicating a substantial gain in both conceptual understanding and practical skills.

### Results of the Eco-Art–Based Diorama Learning Media Development Program

The implementation of the first phase of the Community Partnership Empowerment Program (PKM) demonstrated significant and measurable outcomes in improving the competencies of early childhood education (PAUD) teachers in developing ecoart–based thematic learning media. The program involved partner PAUD teachers in Aceh Besar Regency, with attendance and active participation exceeding 90%, indicating strong alignment between the program objectives and the actual needs of the partners. More specifically, out of 70 participating teachers, 65 (92.8%) attended the full program sessions, and approximately 85% of participants actively engaged in hands-on activities, particularly during diorama creation.

The initial stage of the program focused on preparation and problem identification through field surveys, observations, and coordination meetings with the Aceh Besar Regency Education Office and the administrators of the Kindergarten Teachers Association (IGTKI) (Fig. 1).

The identification results revealed that the use of learning media by PAUD teachers had not been optimal and was not fully implemented within a thematic learning framework. Furthermore, teachers skills in developing creative learning media, particularly those utilizing recycled and environmentally friendly materials, were limited. These conditions resulted in a restricted variety of media and minimal integration of environmental awareness values into PAUD learning practices. Quantitative findings from the needs assessment indicated that more than 65% of teachers relied on commercially produced learning media, and fewer than 40% had prior experience in developing learning media using recycled materials.



**Fig. 1.** Coordination and needs assessment activities with PAUD teachers, the Education Office, and IGTKI of Aceh Besar Regency

These findings formed the basis for designing training modules and eco-art–based diorama learning media. The modules were systematically developed by considering alignment with the PAUD curriculum, the availability of locally sourced recycled materials, and the safety and aesthetic aspects of learning media. The diorama prototypes served as concrete examples to guide teachers in adapting and further developing learning media according to the needs of their respective PAUD institutions (Fig. 2).



**Fig. 2.** Examples of thematic eco-art diorama learning media produced by participating PAUD teachers

The workshop and mentoring activities were conducted using a hands-on approach, which included demonstrations, direct practice in media production, discussions, supervision, and feedback. This approach enabled teachers to gain practical experience in designing and producing eco-art-based thematic diorama media (Fig. 3). Each teacher group successfully produced at least one diorama product aligned with PAUD learning themes.



**Fig. 3.** Hands-on workshop and mentoring sessions on eco-art-based diorama media development for PAUD teachers

All participant groups (100%) were able to produce at least one diorama, indicating that the training approach was effective in facilitating practical skill development.

### Analysis of Teachers Competency Improvement

The evaluation of program outcomes was conducted through pre- and post-activity questionnaires, observations of participant engagement, and assessments of the media products developed. The evaluation results indicated a significant improvement in teachers understanding and skills related to PAUD thematic learning and eco-art principles.

Prior to the program, teachers levels of understanding were categorized as moderate, with

average scores below 70. After participating in the training and mentoring activities, the average scores increased to the good to very good categories, with scores exceeding 80. The most substantial improvements were observed in the following indicators: (1) understanding of PAUD thematic learning principles, (2) ability to identify and select safe and educational recycled materials, (3) skills in designing thematic diorama learning media, and (4) ability to integrate learning media into PAUD instructional scenarios.

More specifically, a quantitative analysis of the questionnaire results showed that the mean scores increased from 2.5–2.9 (moderate level) in the pre-test to 4.0–4.3 (good–very good level) in the post-test, indicating significant improvement across all assessed competencies.

A detailed comparison of teachers' competencies before and after the program is presented in Table 1. In terms of outputs, approximately 85%–90% of the diorama media products developed by the teachers were assessed as feasible for classroom use based on pedagogical, aesthetic, and safety criteria. These results demonstrate that teachers not only comprehended theoretical concepts but were also capable of translating them into functional and contextually relevant learning media.

### Teachers Attitudes, Commitment, and Program Sustainability

In addition to competency improvement, the PKM program also resulted in positive changes in teachers attitudes and commitment. Attitudinal survey results indicated that more than 80% of participating teachers expressed readiness and commitment to sustainably implement eco-art-based diorama media in thematic classroom learning. This finding suggests that the program generated not only tangible media products but also readiness for long-term implementation and transformation of instructional practices in PAUD institutions.

More specifically, the results showed that 84% of teachers expressed readiness to implement eco-art-based diorama media in classroom learning, while 82% demonstrated the ability to independently design and develop such media. In addition, 87% of teachers showed improved understanding of eco-art principles and their application in thematic learning. The sustainability analysis further revealed that the program has strong potential for continuity. Improved teacher competencies enable the independent development of learning media without reliance on commercially manufactured products. The availability of locally sourced recycled materials supports cost efficiency and long-term sustainability.

**Table 1.** Improvement of PAUD Teachers competencies before and after the program

| No. | Assessed Aspect           | Indicator                                   | Pre-Test Mean | Post-Test Mean | Gain | Final Category |
|-----|---------------------------|---------------------------------------------|---------------|----------------|------|----------------|
| 1   | Conceptual Understanding  | PAUD thematic learning principles           | 2.8           | 4.2            | +1.4 | Good-Very Good |
| 2   | Eco-Art Knowledge         | Understanding eco-art principles            | 2.5           | 4.0            | +1.5 | Good           |
| 3   | Media Design Skills       | Ability to design thematic diorama          | 2.9           | 4.3            | +1.4 | Good-Very Good |
| 4   | Use of Recycled Materials | Selection of safe and educational materials | 2.6           | 4.1            | +1.5 | Good           |
| 5   | Media Product Quality     | Pedagogical, aesthetic, and safety aspects  | —             | 4.2            | —    | Feasible-Good  |
| 6   | Teachers Commitment       | Readiness to implement media                | 2.7           | 4.2            | +1.5 | Very Good      |

**Table 2.** Program sustainability indicators of the eco-art-based diorama learning media development

| No. | Sustainability Aspect     | Indicator                                          | Program Outcome (Quantitative)                  | Sustainability Level |
|-----|---------------------------|----------------------------------------------------|-------------------------------------------------|----------------------|
| 1   | Teacher Competency        | Ability to independently design learning media     | 82% of teachers capable                         | High                 |
| 2   | Classroom Implementation  | Use of diorama media in PAUD learning              | 84% of teachers ready to implement              | High                 |
| 3   | Availability of Materials | Use of locally sourced recycled materials          | 100% materials accessible locally               | Very High            |
| 4   | Curriculum Integration    | Alignment with PAUD curriculum                     | 90% of media applicable across themes           | High                 |
| 5   | Environmental Awareness   | Internalization of eco-art values                  | 87% of teachers demonstrated understanding      | High                 |
| 6   | Program Replicability     | Potential to be applied in other PAUD institutions | 85% feasibility based on participant feedback   | High                 |
| 7   | Partner Empowerment       | Teachers independence as media developers          | 80% reduction in reliance on manufactured media | High                 |

Moreover, the alignment of diorama media with the PAUD curriculum allows for flexible integration across various learning themes. The indicators of program sustainability are presented in [Table 2](#).

## Discussion

The findings indicate that a hands-on training and mentoring approach is effective in strengthening PAUD teachers pedagogical competencies. The learning-by-doing model enabled teachers to directly translate conceptual knowledge into practical media production, which is particularly suitable for adult learners. The novelty of this community service program lies in the integration of eco-art principles, thematic diorama media, and teacher empowerment strategies. Teachers were positioned not merely as users of learning media but as designers and producers of instructional materials based on local potential and recycled resources. This approach contributes to educational innovation and environmental awareness, reinforcing sustainable education values from an early age.

The findings of this program indicate that hands-on training and mentoring approaches are effective in enhancing PAUD teachers pedagogical competencies. The observed improvements in teachers understanding and skills support the perspective that adult learning models emphasizing *learning by doing* and contextual problem-solving produce more meaningful outcomes than conventional lecture-based approaches.

This finding is consistent with experiential learning theory, which emphasizes that knowledge is constructed through active engagement, reflection, and practical application (Kolb et al., 2014). The significant increase in teachers' competency scores (from a mean of 2.5–2.9 to 4.0–4.3) indicates that the learning-by-doing approach effectively facilitates both conceptual understanding and skill development.

The eco-art-based thematic diorama media developed through this program significantly support concrete, visual, and contextual learning for early childhood learners. The three-dimensional and

manipulable nature of diorama media enables children to construct conceptual understanding through direct interaction, which aligns with the cognitive developmental stages of early childhood (Piaget, 1964; Vygotsky, 1978). Consequently, the use of such media has strong potential to enhance student engagement and improve the overall quality of thematic learning in PAUD.

From a constructivist perspective, this finding is closely aligned with Piaget's theory, which states that children in the preoperational and concrete operational stages learn best through interactions with tangible objects (Piaget, 1964). The use of diorama media allows children to manipulate physical representations of concepts, such as environments, animals, and daily activities, thereby facilitating the construction of knowledge through concrete experiences rather than abstract explanations (Morrison, 2012).

For example, in a thematic lesson on "My Environment," children can interact with miniature representations of houses, roads, and trees in the diorama, enabling them to understand spatial relationships and environmental concepts through direct exploration. This supports the processes of assimilation and accommodation, as described in Piaget's cognitive development theory (Piaget, 1964).

Furthermore, the integration of eco-art principles into learning media development adds value by promoting environmental education from an early age. The utilization of recycled materials fosters creativity among teachers and children and instills values of environmental awareness, efficiency, and social responsibility (Budiarti & Wardana, 2025). These findings demonstrate that art-based learning in PAUD can function simultaneously as a medium for character education and for sustainable development (UNESCO, 2017; Kartika et al., 2023).

These findings are consistent with previous studies on ecoart education, which highlight that the use of recycled materials in learning activities enhances both creativity and environmental awareness among learners (Inwood, 2013; Nurtiansyah & Wardhani, 2023; Sari & Widodo, 2021). Compared to conventional learning media, ecoart-based media provide a more contextual and meaningful learning experience, particularly in early childhood education settings (Afifah et al., 2022; Hanifah & Setyasto, 2024).

From the perspective of community engagement innovation, this program demonstrates novelty through the integration of thematic learning media development, eco-art approaches, and teacher-empowerment strategies. Teachers are positioned not merely as passive users of learning media but as designers and producers of instructional materials based on local potential and needs. This

approach strengthens program sustainability, as the competencies acquired enable teachers to independently replicate and further develop learning media.

Compared with similar community service programs that focus primarily on training or product development, this program offers a more comprehensive approach by combining capacity building, practical production, and sustainability orientation (Chambers, 1997). This integrated model represents a key strength of the program and contributes to its potential for replication in other PAUD contexts.

Overall, the measurable achievements observed in the first phase indicate that the community engagement program has met the success indicators at the levels of process, output, and initial outcomes. These results confirm that the development of eco-art-based diorama learning media is an effective and relevant strategy for improving the quality of thematic learning in early childhood education while simultaneously strengthening environmental education through a community empowerment approach.

Program sustainability is supported by several key factors. First, improved competencies enable teachers to independently develop learning media without relying on commercially manufactured products. Second, the use of locally available recycled materials ensures cost efficiency and long-term feasibility. Third, the alignment of diorama media with the PAUD curriculum allows for flexible integration across various learning themes. Survey results showed that more than 80% of participating teachers expressed readiness and commitment to sustainably implement eco-art-based diorama media in their classrooms. These indicators demonstrate the strong potential for program replication and long-term impact in other PAUD institutions.

Despite these positive outcomes, several limitations must be acknowledged. The program was conducted within a limited timeframe, which constrained opportunities for more in-depth mentoring and iterative product refinement. In addition, the evaluation focused primarily on short-term outcomes and did not assess the long-term impact on classroom practices or on student learning outcomes. These limitations should be addressed in future community service programs through extended implementation periods and longitudinal evaluation.

## CONCLUSION

The Community Partnership Empowerment Program, which developed eco-art-based diorama learning media from recycled materials for PAUD teachers in Aceh Besar Regency, demonstrated

positive and measurable outcomes. The first phase results confirmed significant improvements in PAUD teachers understanding, skills, and attitudes in designing and utilizing creative, safe, and environmentally friendly thematic learning media.

Program achievements were evident not only in enhanced teacher competencies but also in tangible outputs in the form of thematic diorama media suitable for PAUD learning. High levels of teacher participation and commitment to implementation indicate that hands-on training and partner-empowerment approaches effectively promote sustainable change. Thus, the program contributes meaningfully to improving the quality of PAUD thematic learning while integrating environmental awareness values from early childhood.

More specifically, the measurable outcomes of the program included an increase in teachers' competency scores from the moderate level (mean 2.5–2.9) to the good–very good level (mean 4.0–4.3), 88% feasibility of diorama products for classroom use, and 82% of teachers demonstrating the ability to independently develop eco-art-based learning media. In addition, more than 80% of teachers expressed readiness to implement the media sustainably in their teaching practices.

The main contribution of this program is its integrated approach, which combines ecoart principles, thematic learning media development, and teacher empowerment within a participatory training framework. This approach positions teachers not only as users but also as creators of learning media based on locally available resources, thereby supporting both instructional innovation and sustainable education practices.

Despite these positive outcomes, several limitations must be acknowledged. The program was conducted within a relatively short period, limiting opportunities for extended mentoring and iterative improvement of the learning media. Furthermore, the evaluation focused primarily on short-term outcomes and did not assess the long-term impact on classroom practices or student learning.

Future community service programs should incorporate longitudinal evaluations to assess sustained implementation and impact. Additionally, extended training durations and differentiated mentoring strategies should be considered to accommodate variations in teachers' initial competencies. Further development may also explore the integration of digital or hybrid eco-art learning media to expand the scope and applicability of this approach

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