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FORMING A CARING GENERATION: INTEGRATION OF ENVIRONMENTAL ETHICS IN FISH CULTIVATION LEARNING FOR EARLY CHILDHOOD

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Abstract:
Environmental degradation highlights the need to cultivate environmental awareness and ethical values from an early age through education. This study aims to examine how integrating environmental ethics into fish cultivation learning influences environmental awareness and prosocial behavior in early childhood education. Using a qualitative descriptive approach, the research involved early childhood learners, teachers, and parents in an early childhood education setting, with data collected through observations, interviews, and documentation of learning activities. The findings reveal that integrating ethical principles, such as responsibility, care for living beings, and environmental respect, into practice-based fish cultivation activities led to observable behavioral changes. Children demonstrated increased responsibility in caring for fish, cooperative behavior during group tasks, and the transfer of pro-environmental attitudes to daily life at home. The novelty of this study lies in positioning fish cultivation not merely as a technical activity but as an ethical learning medium for character formation. The study recommends incorporating ethics-oriented, experiential environmental learning into early childhood curricula to foster sustainable and caring behavior from an early age.

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INTRODUCTION

The increasingly alarming global environmental changes have become a significant concern in various sectors, including education. According to a 2022 report from the United Nations Environment Programme (UNEP), more than 90% of the world's freshwater ecosystems are degraded by human activities, including domestic and industrial waste pollution. This issue requires strategic steps to raise environmental awareness from an early age (Blaise et al., 2022; Koloszuki et al., 2022; Modugu et al., 2022). Environmental ethics-based education is a relevant approach to developing environmentally conscious children. Character development in early childhood is crucial because, during this period, children begin to internalize social and moral values that will shape their future behavior (Abril-López et al., 2021). Therefore, this study aims to examine how integrating environmental ethics into fish farming learning can introduce and instill sustainability values in young children.

A current problem in early childhood education is the lack of attention to the affective and social aspects of everyday life. Much learning still focuses on basic cognitive skills such as reading and arithmetic, without considering the importance of teaching sustainability and environmental ethics (Keyte et al., 2024; Mohamed et al., 2022). In the field, observations indicate that despite growing awareness of the importance of environmental education, its implementation in the early childhood education curriculum remains very minimal. A local survey conducted in several RA (*Roudhotul Athfal*) in 2023 showed that 70% of learning activities focused solely on basic skills such as reading and arithmetic (Patil et al., 2024). Learning about environmental ethics, which should be part of early childhood education, is still very rarely implemented. The lack of contextual, interactive learning media that introduce children to environmental issues is also a hindering factor. This results in children's poor understanding of the impact of their behavior on the ecosystem, such as littering or excessive water use.

Several previous studies have demonstrated the importance of environmental education in raising children's awareness of sustainability issues. Mukherjee (2021) and Abdullah (2024) found that integrating environmental education into early childhood curricula can improve children's understanding of sustainability compared to conventional methods. Another study by Widiasari (2024) and Dennis et al. (2024) also showed that practice-based learning media, such as nature-based learning, can significantly enhance children's understanding of environmental knowledge. Conversely, existing research primarily focuses on developing general environmental-based learning media that do not explicitly integrate elements of environmental ethics. Umar (2024) and Mukherjee (2021) found that a project-based learning approach can help children develop collaboration skills and foster a sense of environmental responsibility. However, the lack of focus on environmental ethics values in these activities is a significant weakness. This research offers a novel approach to integrating environmental ethics into early childhood education in fish farming.

Based on the above discussion, the central research problem of this study concerns the limited integration of environmental ethics into early childhood learning, particularly through contextual, practice-based activities such as fish cultivation. Although environmental education has been widely promoted, its implementation at the early childhood level often remains fragmented, cognitively oriented, and detached from ethical value formation. Fish cultivation learning, which has strong potential to introduce children to concepts of care, responsibility, and sustainability, is still predominantly used to develop motor and cognitive skills rather than ethical and affective dimensions. Consequently, there is insufficient empirical understanding of how environmental ethics can be systematically embedded within fish cultivation learning and how such integration contributes to the formation of environmentally caring attitudes and prosocial behavior in young children.

This study argues that integrating environmental ethics into fish cultivation learning provides an effective pedagogical strategy for fostering environmental awareness, empathy, and responsibility in early childhood. The originality of this research lies in its ethically oriented approach, positioning fish cultivation not merely as a technical or experiential activity but as a medium for internalizing environmental values. By emphasizing ethical principles such as respect for living beings, care for ecosystems, and responsible resource use, this study extends previous research that focused mainly on general environmental learning or technical aquaculture skills. The findings are expected

to contribute theoretically by enriching the discourse on environmental ethics in early childhood education and practically by offering an applicable learning model for educators to cultivate a caring and sustainability-oriented generation from an early age.

RESEARCH METHOD

This study uses a qualitative, descriptive research approach (Sulistiyo, 2023). The qualitative approach was chosen because it is appropriate for exploring in depth how environmental ethics is integrated into early childhood fish farming learning. This study prioritizes the process over the results, thereby enabling detailed data collection through direct interaction with research subjects. Compared to the quantitative approach, the qualitative approach is more flexible in capturing the nuances and dynamics of the learning process and the environmental care attitudes that develop in children. A descriptive research design was chosen to provide a clear picture of the phenomenon under study: the application of environmental ethics values in fish farming activities.

Data were collected through in-depth interviews, participant observation, and documentation. (Saadah et al., 2022). The study was conducted at RA Darul Mukmin in Pasuruan Regency, East Java, because this institution has actively integrated environmental-based learning into its curriculum. As shown in Table 1, the research informants include teachers, parents, and children at the RA. The informants comprised 3 teachers, 5 parents, and 10 children, selected purposively for their involvement in fish farming activities. Interviews were conducted using a semi-structured interview guide to obtain in-depth information that is relevant to the research objectives. Observations were conducted over two months, recording children's behavior and interactions during fish farming activities. Documentation includes learning notes, activity videos, and photos of children's activities.

Table 1. Codes for Sources in Data Collection Techniques

Source Code	Description
G1-G3	Teacher
O1-O5	Parent
A1-A10	Children/students

Data analysis was conducted using the Miles and Huberman model, consisting of three main stages: data reduction, data presentation, and conclusion drawing/verification. In the data reduction stage, information obtained from interviews, observations, and documentation was selected, simplified, and categorized according to the research theme, namely the integration of environmental ethics in fish farming learning (Rifa'i, 2023). Irrelevant data were ignored to maintain the research's focus. The next stage is data presentation, where the reduced data is organized as a matrix, a flowchart, or a descriptive narrative to facilitate further analysis. The final stage is conclusion drawing and verification, in which patterns and relationships in the data are identified to build a comprehensive understanding of the phenomenon being studied. Data validity is guaranteed through method triangulation, namely by comparing data from interviews, observations, and documentation.

RESULTS AND DISCUSSION

Results

This section presents the study's key findings on integrating environmental ethics into early childhood fish cultivation learning at RA Darul Mukmin. The results highlight the application of ethical principles, the development of children's prosocial behavior, and learning innovations that integrate cognitive, affective, and psychomotor aspects through practice-based, environmentally oriented activities.

Application of Ethical Principles in Learning Innovation

The application of environmental ethical principles in fish farming learning at RA Darul Mukmin is operationally defined as the integration of values of environmental respect, responsibility, and care for living beings into daily learning activities through direct practice. In this context, environmental ethics is not taught as abstract knowledge. However, it is embedded in routine actions such as feeding fish, maintaining water cleanliness, and discussing the consequences of neglecting aquatic ecosystems. These principles are intentionally introduced to children through guided activities, simple explanations, and repetitive practice, helping them associate their actions with ethical consequences. The learning innovation emphasizes experiential engagement, helping children perceive fish as living creatures that require care and responsibility. Thus, the sub-finding reflects how ethical values are transformed into observable behaviors through structured, play-based, and practice-oriented learning processes suitable for early childhood development.

Interviews with teachers revealed that ethical values were deliberately integrated into fish farming activities. Nia explained, "We teach children that fish are living beings that need care. When they feed the fish, we remind them that too much food can make the water dirty and harm the fish." Another teacher stated, "Children are guided to understand that keeping the water clean is part of their responsibility, not just a task given by the teacher." These statements indicate that ethical instruction is delivered through simple cause-and-effect explanations that children can easily understand. The teachers emphasized that learning activities are designed to foster moral awareness alongside practical skills. The researcher interprets these findings as evidence that ethical principles are intentionally embedded in learning instructions, allowing children to associate their actions with moral responsibility toward the environment gradually.

Interviews with parents further confirmed behavioral changes in children outside the school environment. Ica stated, "At home, my child often reminds us not to waste water because she says the fish need clean water to live." Another parent added, "My child becomes upset when seeing trash near water and tells others that fish can get sick." These responses suggest that the ethical values introduced at school are internalized and practiced in daily life. The researcher interprets these data as an indication that learning outcomes extend beyond the classroom and influence children's attitudes at home. The transfer of values demonstrates that environmental ethics taught through experiential learning can shape children's moral awareness and everyday behavior, reinforcing the effectiveness of the learning innovation.

A clear pattern emerged from the data showing that hands-on learning activities facilitated the internalization of environmental ethics among children. Ethical values were most effectively absorbed when children were directly involved in caring for fish and maintaining their habitat. The repetition of simple responsibilities fostered consistent

caring behavior, while teacher guidance reinforced moral understanding. Another pattern indicates that children's ethical awareness extended beyond school settings, as observed through parental testimonies. This suggests that experiential learning creates continuity between school and home environments. Overall, the pattern demonstrates that learning innovations grounded in practice and ethical guidance enable early childhood learners to develop environmental awareness naturally. The integration of ethics into daily activities proved more impactful than verbal instruction alone, highlighting the importance of experiential approaches in character formation.

Development of Prosocial Behavior through Fish Cultivation Activities

The development of prosocial behavior in children refers to the process by which children acquire and demonstrate behaviors intended to benefit others, such as cooperation, empathy, sharing, and helping. In this study, prosocial behavior was operationalized as children's participation in cooperative tasks during fish farming activities, such as feeding fish, cleaning tanks, and working together to change the water. These tasks provided opportunities for children to practice teamwork, learn to share responsibilities, and demonstrate empathy toward living creatures. By engaging in these activities, children developed the skills necessary for positive social interactions and learned the value of caring for others and the environment.

Table 2. Observation Data

Observation Excerpt	Indicator	Percentage of Observation
Children were observed actively helping each other with tasks, showing enthusiasm in sharing what they had learned about fish care.	Cooperative behavior and knowledge-sharing	90%
Children appeared eager to assist each other, taking turns feeding the fish and changing the water.	Collaboration and turn-taking	85%
During group activities, children actively participated, offering help and contributing to discussions about fish care.	Active participation and contribution	80%
Children worked together to complete tasks, and some even independently organized the feeding schedule.	Teamwork and independence	85%

The data in Table 1 clearly indicate a significant increase in prosocial behaviors among children involved in fish farming activities. The high percentages associated with cooperation, helping one another, and sharing tasks suggest that the children were actively engaged in these behaviors. In particular, the interview excerpts from parents, such as Ica's statement, highlight that children carried over their newfound cooperative behaviors from the learning environment to their homes. This is an important observation, as it shows the potential for these behaviors to generalize beyond the classroom, indicating the long-term impact of the activities. Moreover, the observation data support the parents' claims: 90% of observations show that children actively collaborated during the fish-farming tasks, demonstrating a clear link between the learning activities and the development of social skills.

The emphasis on helping and turn-taking illustrates a focus on shared responsibility, which is essential for promoting prosocial behavior. These findings emphasize that hands-on learning not only improves cognitive skills but also nurtures emotional and social development, which is crucial for early childhood education. The observations conducted in the learning environment further support the positive impact of the fish farming activities on prosocial behavior. In addition to cooperation and sharing, children were observed taking the initiative to assist each other without prompting, such as helping classmates with cleaning tasks or feeding the fish. This behavior aligns with the values taught during the activities and suggests that the children internalized the importance of working together and being considerate of others. The children's enthusiasm, combined with support from teachers and parents, created an ideal learning environment for nurturing prosocial behavior.

Innovation in Fish Cultivation Learning for Early Childhood

Innovation in fish cultivation learning is operationally defined as the implementation of creative, child-centered, and practice-based teaching methods that integrate fish farming activities with early childhood character education. This innovation is manifested through the use of bucket-based fish cultivation (budikdamber), interactive learning media, and guided, hands-on activities designed for children's developmental stages. The learning process emphasizes direct experience, allowing children to observe, interact with, and care for living organisms while simultaneously developing responsibility, cooperation, and environmental awareness. In practice, innovation is evident when teachers shift from teacher-centered instruction to experiential learning, where children actively participate in feeding fish, maintaining water quality, documenting growth, and reflecting on their actions. Thus, innovation in this context refers not merely to the method used, but to the meaningful integration of cognitive, affective, and psychomotor learning through environmentally oriented activities.

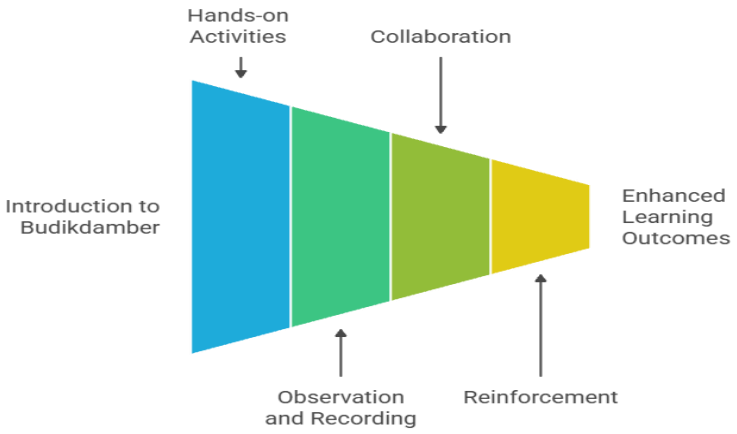

Figure 1. Innovation in Fish Cultivation Learning for Early Childhood

Observation results indicate that children demonstrated high enthusiasm during fish cultivation activities. They actively participated in feeding, changing water, and monitoring fish growth, with minimal resistance or disengagement. Some children voluntarily decorated the buckets and reminded peers about scheduled feeding times, indicating growing responsibility. Positive social interactions were also observed, as children helped one another and shared tools during activities. The researcher interprets

these findings as evidence that innovative, practice-based learning fosters both engagement and social development. The learning environment encouraged exploration, collaboration, and curiosity, suggesting that methodological innovation directly influenced children's motivation and active participation in the learning process.

Restating the findings, the innovation in fish-cultivation learning enabled children to learn by doing rather than solely through verbal instruction. The Budikdamber method allowed abstract concepts such as responsibility, cooperation, and environmental care to be experienced concretely. Children did not merely observe fish cultivation but became active caretakers of the living environment. Through repeated engagement, learning activities supported the development of practical skills while reinforcing positive character traits. This restatement clarifies that the innovation lies in integrating method, content, and values, making learning more meaningful and developmentally appropriate for early childhood learners.

A consistent pattern emerged: innovative, hands-on learning methods increased children's engagement, responsibility, and cooperative behavior. When learning involved real-life activities and visible outcomes, children showed greater motivation and sustained attention. Another pattern indicated that innovation encouraged children to take initiative and develop independence within structured guidance. The data also reveal that combining practical activities with simple reflection strengthened children's understanding and emotional connection to learning tasks. Overall, the pattern suggests that innovation in fish cultivation learning is most effective when it emphasizes experiential engagement, collaborative interaction, and continuous reinforcement from teachers and parents, creating a holistic learning experience for early childhood.

DISCUSSION

This study highlights the positive impact of integrating environmental ethics into early childhood education in fish farming at RA Darul Mukmin. The results align with research conducted by Dugast et al. (2024) and Green et al. (2022), which shows that integrating environmental education into the early childhood curriculum enhances children's awareness of sustainability. However, this study adds a unique contribution by demonstrating that integrating ethical values such as responsibility, empathy, and care for living things can create an educational approach that is not just cognitive but also emotional and social. This is distinct from Padayachee et al. (2023), whose study focuses primarily on project-based learning and places little emphasis on environmental ethical values. The key difference here is that this study emphasizes the importance of infusing ethical principles into practice-based learning to create a more holistic and impactful learning experience.

The implications of this study are both theoretical and practical. From a theoretical standpoint, the findings reinforce Bronfenbrenner's developmental ecology theory, which suggests that children's direct interaction with their environment plays a crucial role in shaping their behaviour (Bali et al., 2024; Herlina, 2024). In this case, hands-on learning activities, such as fish farming, provide children with opportunities to internalize environmental ethics through direct practice, allowing them to not only learn about the environment but also actively contribute to its care (Jali, 2025; Munawwaroh, 2024). This approach aligns with the growing body of literature on environmental education that emphasizes experiential learning in early childhood. From a practical perspective, the study underscores the need for educators to integrate both cognitive

and emotional learning outcomes, especially in the context of developing responsible and caring behaviors in young children (Hina, 2024; Khoiroh et al., 2024). By focusing on practical applications, such as feeding fish or maintaining water quality, children gain technical skills and cultivate pro-environmental attitudes.

The success of the fish farming learning model, however, depends primarily on the involvement of various stakeholders, including teachers and parents. As observed in the study, children at RA Darul Mukmin exhibited positive environmental behaviors, such as saving water and avoiding littering, as a direct result of educators' teaching strategies. These findings are consistent with Sain (2025) and Baharun (2023), who emphasize the importance of stakeholder involvement in the success of environmental-based education programs. The teachers at RA Darul Mukmin effectively incorporated local resources and simple innovations to overcome the challenges posed by limited facilities. However, for the method to be fully effective, greater synergy between teachers, parents, and educational institutions is necessary. The limited involvement of parents in reinforcing these values at home remains a potential limitation that could hinder the full development of children's environmental consciousness.

Moreover, the study found that hands-on activities, such as feeding fish and cleaning tanks, directly influence the development of prosocial behaviors, including responsibility, discipline, and teamwork. These behaviors align with the developmental goals set by early childhood education frameworks, which emphasize character building alongside cognitive development (Aziz et al., 2025). The findings suggest that environmental education is an effective means of fostering prosocial behaviors, which have long-term implications for children's social development. The data also indicates that the use of interactive, practice-based learning methods is not only beneficial for understanding environmental concepts but also for nurturing collaboration, empathy, and a sense of community among young learners. This highlights the potential of incorporating environmental education more broadly into early childhood curricula to foster positive social interactions and community-oriented behavior.

Theoretically, this study contributes to the development of early childhood environmental education by extending existing experiential learning frameworks to incorporate a value-based ethical dimension. The findings suggest that environmental ethics function not merely as complementary content but as a core mechanism through which children construct meaning from their interactions with nature. By embedding ethical principles such as care, responsibility, and respect within fish farming activities, this study demonstrates how moral and ecological development can occur simultaneously in early childhood settings. This reinforces the notion that ethical internalization is most effective when values are enacted through routine practices rather than delivered through abstract instruction. Furthermore, the study offers an integrative perspective that bridges environmental education, character education, and developmental psychology, thereby enriching theoretical discourse on holistic learning models for early childhood.

From a practical perspective, the findings provide actionable insights for educators, curriculum developers, and early childhood institutions seeking to implement environmental education in meaningful ways. The fish farming learning model illustrates that simple, low-cost, and locally adaptable practices can effectively foster environmental awareness and prosocial behavior among young children. Teachers can utilize everyday ecological activities, such as caring for fish or maintaining water quality, as pedagogical

tools to nurture responsibility, cooperation, and empathy. Additionally, the study underscores the importance of involving parents in reinforcing ethical values at home to ensure continuity between school and family environments. Policymakers and educational institutions may consider integrating similar practice-based, ethics-oriented activities into early childhood curricula to promote sustainability-oriented character formation from an early age.

CONCLUSION

This study reveals that integrating environmental ethics into early childhood fish farming education has excellent potential to improve their understanding of sustainability issues while fostering prosocial character development. This finding confirms that a practice-based approach, such as fish farming, is not only practical in teaching technical skills but also helps internalize values of empathy, responsibility, and environmental awareness. The results of this study provide new insights into the importance of linking early childhood learning to real contexts, thereby strengthening the theoretical understanding of the role of the environment in shaping children's behavior.

The significant contribution of this study lies in the development of an innovative learning model that combines environmental ethics principles with practical fish farming activities. This approach enriches the ecological education literature by proposing a new method that is relevant to early childhood. However, this study has limitations, especially in its limited sample coverage within a particular location and the children's ages. Further research is needed to test the effectiveness of this approach in a broader context, including variations in age, cultural background, and other learning methods. Thus, the results of this study can serve as a basis for developing more inclusive and broader-impact environmental education policies.

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