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Reviving The Forgotten Component Environmental Education In Mainstream Pedagogy

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ABSTRACT

This paper presents the results of an analysis of the implementation of Environmental Education at the formal and higher education levels. EE is often overlooked in learning, yet it is crucial to ensuring human survival. This research was conducted by revisiting the main goals of EE in the classroom, by building a framework of interconnections using the Theory of Change (ToC) between classroom interactions and their impact on improving insight and knowledge at formal education and higher education levels. The results of this research indicate that (1) The implementation of EE is still predominantly in the Cognitive Domain (2) learning interaction implementation has not yet had a significant impact on the practical elements expected from EE (3) Formal education contributes more than higher education in the context of EE.

Keywords: *Environmental Education, Teachers, Theory of Change*

1. INTRODUCTION

Environmental Education started to be included in educational programs in the early years, taking as a reference green building practices [1]. This reflects a substantial innovation that has taken place in the field of education, particularly involving the environmental dimension. Moreover, it is expected that educational practitioners possess a greater capacity to adapt to the evolution of integration between education and the environment.

Educational practitioners believe that Environmental Education is a combination of formal and informal learning aimed at successfully sharing knowledge and awareness about the environment [2], [3]. This definition implies that there is another concern from the education sector, especially in preserving and protecting the environment. Within the Education for Sustainable Development framework, environmental ethics are a consideration in achieving changes in the way of thinking, attitudes, and actions [4]. These environmental ethics are the primary outcomes intended to be achieved through Environmental Education.

The evolving interconnection between the environment and learning is increasingly understood as a determining factor in the success of the learning

process. Built environment education is becoming more popular and crucial as a more significant percentage of the world's population lives in urban areas daily [5]. The residential built environment affects student satisfaction and academic performance during remote education [6]. The skills and knowledge imparted through EE were essential for implementing community projects, helping to improve community participation in raising environmental quality, thus improving environmental performance, farming methods, and livelihood situations [7]. Other research has also demonstrated that Environmental Education had a positive attitude toward the intelligent learning environment, and gender, age, grade, subject category, and other variables had a limited impact on spatial preference. [8]

Despite the impressive results demonstrated by elaborating on education and the environment, there needs to be a consensus on a primary outcome that can assist in developing a strategic research agenda and priorities [9]. Efforts to harmonize this perception have been made, and some main frameworks proposed through the Delphi method with educational experts are presented in the literature review. Environmental education addresses wicked problems [10], such as climate change and biodiversity loss, which are mired in the complexities inherent in socioecological systems.

Brazil, for instance, is a country facing diversity and promoting the optimization of Environmental Education. Three research focuses on Environmental Education that has been carried out are the social community gap in the Marxist perspective, mass media content production, and community construction among teachers [11]. Contrary to the exploration results of previous research in other countries such as Thailand, which interpret the efforts to improve Environmental Education outcomes by examining the impacts among groups or institutional circles, from Administrator Characteristics, Teacher Characteristics, and Environmental Education Principles, which affect Environmental Education Strategies through Public Thinking about Environmental Conservation. These results show that IPM significantly impacts EES, while EEP is the most dominant factor driving success among AC, TC, and EEP [12].

2. LITERATURE REVIEW

The theory of Environmental Education (EE) is developed based on the understanding that education plays a crucial role in shaping human attitudes and behaviors toward the environment. This theory aids individuals in understanding how human interaction with the environment can impact their environmental and social well-being. [13].

The EE theory views the educational process as a means to develop an understanding of environmental issues, including knowledge about how nature works and how human actions can affect these natural processes. Its primary goal is to equip individuals with the knowledge, skills, attitudes, and commitment necessary to act wisely toward the environment and environmental issues. [14].

Furthermore, this theory also guides environmental education in schools. According to Krasny and Roth [15], learning involves more than just factual knowledge in school environmental education. Further, this learning encompasses conceptual understanding, practical skills, and moral and ethical values related to the environment.

Environmental education also emphasizes the importance of learning through direct experience. According to the experiential learning theory proposed by Kolb [15] direct experiences in the context of natural or social environments can support a deeper understanding of the environment and can promote more sustainable behavioral changes.

In other words, the environmental education theory provides a framework for education centered on the environment, focusing on developing the knowledge, attitudes, and skills necessary to preserve and enhance environmental quality.

Environmental Education (EE) has undergone a long process to reach a consensus on the primary outcomes that are the objectives of EE. A Delphi study involved 44 professional experts and leaders in North America. It yielded five main goals of EE: (1) environmentally related action and behavior change, (2) connecting people to nature, (3) improving environmental outcomes, (4) improving social/cultural outcomes, and (5) learning environmentally relevant skills and competencies [16]. An in-depth study of this framework was conducted to produce appropriate instruments to measure each resulting outcome.

Environmentally related action and behavior change is a code for all forms of action related to the psychomotor domain of learners, grounded in abilities, desires, habits, or action competencies. Connecting people to nature is interpreted as all kinds of activities involving psychic experiences and interactions between learners and the environment. These two components are the simplest essential components that support the success of Environmental Education.

Meanwhile, Ardoin [17] Formulated EE outcomes with the framework of (1) Behavioral Antecedents, (2) Complete Environmental Action, (3) Community Capacity Building, (4) Self-Reported Behavior, (5) Observed Behavior, (6) Ecological Indicators. These components are elaborated with the definition brought by Clark. Using the concept of the simplified Theory of Change (ToC), a framework can be made about the supporting components of EE outcomes based on the simplification of Clark and Ardoin's formulation as follows:

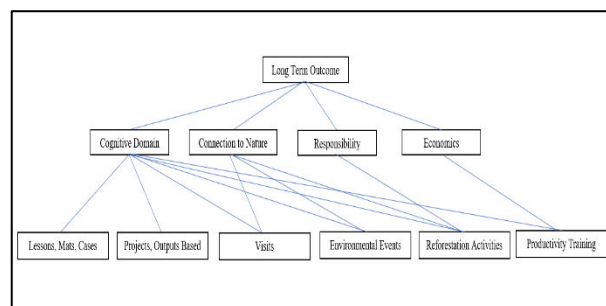


Figure. 1 ToC on Environmental Education Concept

The design diagram above shows the main goal to be achieved: the long-term consistency of students' awareness of managing the environment. Four simple frameworks are mapped based on the ToC approach to reach this stage. The first aspect is the Cognitive Domain, which involves students' levels of understanding in recognizing various concepts close to the environment. Second, Connection to Nature, as described by Clark, is a condition where students or learners engage in direct experiences involving the environment. The third is the responsibility, which is one indicator that measures students' actions after

building sensitivity to the environmental problems around them. And Economics represents how the environment can support good life and welfare.

3. METHODS

The research design commonly used in exploring the outcomes of EE is that as much as 78% of the 119 studies conducted are in the form of Quasi-Experiments, and 82% use Structured Instrument interviews [16]. This research is more straightforward by conducting a survey mapping of educational practitioners in formal, non-formal, and informal education. The study was conducted from April to May 2023 on 78 respondents in the diverse South Papua Province, consisting of Teachers as representatives of formal education and Lecturers as educators at higher education levels. The sampling method used is snowball sampling. The questionnaire items were arranged based on mapping cognitive domains, connections to nature, responsibility of all parties, and economic aspects. Creating these questionnaire items refers to the output framework proposed by Clark. These questionnaire items were then analyzed with a simple mean analysis to see the dominance from the perspective mapped by these questionnaire items. To deepen the results of the research findings, semi-structured interviews were conducted with 12 respondents consisting of 8 teachers and two lecturers. The semi-structured questions referred to the aspects or dimensions established through the ToC framework.

4. FINDINGS AND DISCUSSION

Environmental Education in Indonesia has become a primary focus in creating community awareness and understanding of the importance of ecological sustainability. The government and non-governmental organizations have launched various initiatives and programs to strengthen environmental education at all levels of education. Environmental education in Indonesia emphasizes introducing environmental issues, learning about natural resources, and concrete efforts to involve students in real action for environmental preservation [18]. This is the broad framework that exists in the Indonesian curriculum, so the implementation of this curriculum framework will be reflected more in the proportion of EE implementation in learning.

Specifically, the current national curriculum has integrated environmental topics into various subjects to ensure students comprehensively understand environmental challenges and solutions. As much as 90% of the primary and secondary education curriculum has adopted environmental education as part of the learning content [19]. Thus, students can understand the connection between human activities and their impact

on the surrounding natural environment. At the university level, programs focusing on environmental science, conservation, and sustainability have been growing. These written by students in 2022 also identified that universities had conducted research activities and community service to increase environmental awareness among students and the community.

In its implementation, through this research, it can be seen that the proportion given in the Environmental Education (EE) applied by teachers is quite balanced. When observed from the compiled Theory of Change (ToC) framework, it is apparent that all four aspects of EE have an equal proportion. However, it must be highlighted that the figure for the economic element is the lowest. This requires attention, considering that Indonesia is an agriculturally based country, indicating that our main strength is the agriculture and environmental sectors. Therefore, there is a need to optimize this potential through the role of EE applied in a learning proposition.

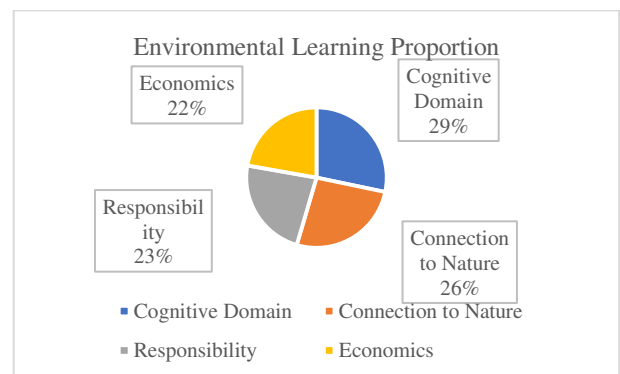


Figure 2 Environmental Learning Proportion

From the above diagram, there is also a tendency for the learning process to still revolve around concepts, and there is a need for improvement in realizing learning in the form of practices or active activities in building environmental awareness and concern. In the diagram, most teachers who implement EE in their classes are more dominant in emphasizing concepts. Even from the perspective of connection to nature, there has been a decrease, let alone in how the environment impacts productive economic activities, or in other words, how this environment significantly affects well-being. This still needs to be a concern for education practitioners in implementing EE.

Through a participatory and project-based approach, environmental education in Indonesia is expected to create students who can think critically and proactively preserve and protect the environment in line with sustainable development goals. The participatory approach in environmental education actively involves students planning and implementing environmental projects in their surrounding environment [20]. This can increase students' motivation to learn and provide

valuable direct experience in nature conservation efforts. In addition, through collaboration with external parties such as environmental NGOs, companies, and the government, students can also understand the roles and responsibilities of various stakeholders in maintaining environmental sustainability.

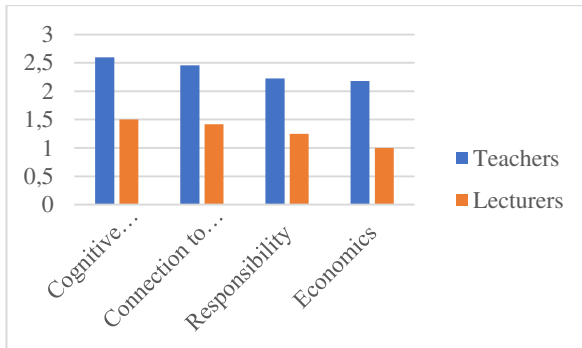


Figure 3. Environmental Learning Gap Between Teachers and Lecturers

The above diagram indicates the gap or differences in the contribution of EE in the conducted learning. Even though both experience a decrease as EE shifts more towards practice, there is still a significant gap between formal education and higher education. In the cognitive domain or other words, if EE is still within the scope of understanding, there is a 29% difference in contribution, a 28% difference in connection to nature, a 26% difference in responsibility, and astonishingly, a 38% difference in Economics, which implies the increasing lack of reinforcement to students that the environment can support welfare.

However, environmental education in Indonesia also faces several challenges in its development journey. One is the need for more resources in terms of budget and supporting facilities. Most schools in remote and rural areas still need adequate access to materials and learning methods relevant to environmental education [21]. This can hinder the effectiveness of environmental education in achieving its objectives.

In addition, public awareness of the importance of environmental education still needs to be improved. Although many programs and campaigns have been held, some people still need to be more concerned about environmental issues. The main challenge is to change the mindset and behavior of people who tend to be consumptive and less environmentally friendly [22]. Therefore, environmental education must be integrated with a cultural approach and local values to achieve sustainable environmental awareness more effectively.

To overcome these challenges, collaboration between various stakeholders becomes very important. The government, schools, universities, NGOs, and communities must work together to create a solid and sustainable environmental education ecosystem. The government can provide more significant support in the

form of policies and adequate budgets for environmental education. Universities can also play an active role in conducting research and innovation in the environmental field to provide intellectual contributions and solutions to the community's environmental issues.

Environmental education in Indonesia is crucial in raising public awareness about the importance of preserving the environment and preventing further damage. Environmental education in Indonesia is integrated into various school subjects, such as Biology, Physics, and Geography [23]. Implementing environmental education provides knowledge about the environment and stimulates positive attitudes and behaviors toward the environment. However, the biggest challenge of environmental education in Indonesia is how to instill correct environmental knowledge and awareness into daily practice because there is still a significant gap between theoretical understanding and practical application [24], also found in this study. To achieve this goal, formal education and higher education teachers are crucial in guiding students in understanding and applying environmental conservation principles in their daily lives [25], [26]. Through effective environmental education, the younger generation in Indonesia is expected to play an active role in protecting the environment for a sustainable future.

5. CONCLUSION

Environmental education in Indonesia has shown positive progress in increasing public awareness and understanding of the importance of environmental sustainability. However, challenges and improvement efforts remain critical in maintaining this positive momentum. Government support, collaboration among various stakeholders, and a participatory approach will be vital to achieving more holistic and long-term impactful goals of environmental education for environmental sustainability in Indonesia.

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