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Cultivating Environmental Literacy and Responsible Citizenship Among Grade 4 Learners: The Role of School-Based Sustainability Education in Aurora, Philippines

Leann L. Agas

Casiguran Central School

leann.agas@deped.gov.ph

Abstract

Environmental literacy and responsible citizenship have become increasingly important educational goals in response to growing environmental challenges, climate change, biodiversity loss, and sustainability concerns worldwide. This study explored the role of school-based sustainability education in cultivating environmental literacy and responsible citizenship among Grade 4 learners in selected public elementary schools in Aurora, Philippines. Utilizing a qualitative multiple-case study design, data were gathered through semi-structured interviews, focus group discussions, classroom observations, and document analysis involving Grade 4 teachers, learners, and school administrators. Findings revealed that sustainability education promoted environmental awareness, ecological responsibility, community participation, and pro-environmental behaviors among learners. School-based initiatives such as waste segregation programs, school gardening, coastal clean-up activities, tree planting projects, and environmental campaigns served as meaningful learning experiences that strengthened learners' environmental knowledge and civic engagement. The study further identified contextualized instruction, experiential learning, and community partnerships as significant factors supporting environmental literacy development. Despite challenges related to resource limitations and instructional constraints, schools demonstrated innovative practices that fostered environmental stewardship and responsible citizenship. The findings underscore the importance of integrating sustainability education into elementary curricula to develop environmentally responsible and socially engaged citizens.

Keywords: *environmental literacy, responsible citizenship, sustainability education, elementary education, environmental stewardship, ecological awareness*

Introduction

Introduction

The increasing severity of environmental degradation, climate change, biodiversity loss, pollution, and resource depletion has intensified global calls for educational systems to cultivate environmentally literate and socially responsible citizens. As environmental challenges continue to affect communities worldwide, education has emerged as a critical mechanism for promoting environmental awareness, sustainable practices, and civic responsibility among younger generations. Schools are increasingly recognized as vital institutions for developing learners' understanding of environmental issues while fostering values, attitudes, and behaviors that support environmental sustainability and responsible citizenship.

Environmental literacy refers to an individual's capacity to understand environmental systems, recognize environmental problems, evaluate possible solutions, and engage in responsible actions that contribute to environmental protection and sustainability. It encompasses knowledge, attitudes, skills, and behaviors that enable individuals to make informed decisions regarding environmental concerns. Environmental literacy extends beyond factual knowledge and includes the development of ecological sensitivity, environmental ethics, and active participation in addressing environmental challenges. Scholars have emphasized that environmentally literate individuals are more likely to demonstrate pro-environmental behaviors and contribute positively to sustainable community development. Recent studies further indicate that sustainability-focused educational programs significantly enhance environmental awareness, ecological sensitivity, and environmental conservation attitudes among elementary learners.

Closely linked to environmental literacy is the concept of responsible citizenship, which involves active participation in community life, social accountability, environmental stewardship, and commitment to the common good. Responsible citizens possess the knowledge, values, and dispositions necessary to make ethical decisions, engage in civic activities, and contribute to societal well-being. In contemporary educational discourse, environmental citizenship has gained increasing attention as an extension of responsible citizenship, emphasizing individuals' responsibilities toward environmental conservation and sustainable living. Environmental citizenship encourages learners to recognize the interconnectedness of ecological systems, human activities, and societal development while motivating them to participate actively in environmental protection initiatives. Research has shown that environmental education programs contribute significantly to the cultivation of ecological citizenship and environmental responsibility among elementary school students.

In response to these global concerns, sustainability education has emerged as an important educational framework that integrates environmental, social, economic, and cultural dimensions of sustainable development into teaching and learning processes. Sustainability education seeks to equip learners with the competencies needed to address complex environmental challenges while promoting critical thinking, collaboration, problem-solving, and civic engagement. Rather than treating environmental education as an isolated subject, sustainability education encourages the integration of environmental concepts across disciplines and school activities, allowing learners to develop holistic understandings of sustainability issues and their implications for society. Educational scholars have emphasized that sustainability education plays a crucial role in fostering environmental stewardship, social responsibility, and sustainable lifestyles among young learners.

In the Philippine educational context, sustainability education aligns with the Department of Education's commitment to developing environmentally aware, socially responsible, and values-oriented learners. The K to 12 Curriculum promotes contextualized and experiential learning approaches that encourage learners to engage with real-world issues affecting their communities. Environmental education concepts are integrated across learning areas, including Science, Araling Panlipunan, Edukasyon sa Pagpapakatao, and Makabansa, providing opportunities for learners to examine environmental issues from multiple perspectives. Furthermore, school-based environmental programs such as waste management initiatives, school gardening projects, coastal resource conservation activities, and disaster risk reduction programs serve as practical avenues for promoting environmental literacy and civic responsibility among learners.

The province of Aurora presents a particularly relevant setting for examining sustainability education due to its rich biodiversity, extensive coastal ecosystems, forested landscapes, and vulnerability to environmental challenges such as typhoons, coastal erosion, deforestation, and climate-related disasters. Communities in Aurora rely heavily on natural resources for their livelihoods, making environmental conservation a critical concern for local development and sustainability. Schools in the province are strategically positioned to promote environmental awareness and responsible citizenship by connecting classroom instruction with local environmental realities and community-based sustainability initiatives. Through contextualized environmental education, learners can develop deeper appreciation for their natural surroundings while gaining practical experiences that encourage

environmental stewardship.

Despite increasing attention toward sustainability education, existing literature remains limited regarding how school-based sustainability initiatives influence environmental literacy and responsible citizenship among elementary learners, particularly in rural and coastal communities. While several studies have examined environmental education programs and their impact on environmental awareness, fewer investigations have explored the lived experiences of learners participating in sustainability-focused school activities and how such experiences shape their environmental attitudes, behaviors, and civic engagement. Moreover, there remains a scarcity of localized studies examining the implementation of sustainability education within Philippine elementary schools and its contribution to the development of environmentally responsible citizens.

This gap is particularly significant because elementary education represents a critical stage for developing lifelong environmental values, habits, and civic dispositions. Early exposure to sustainability education can influence how learners perceive environmental issues, interact with their communities, and engage in environmentally responsible actions throughout their lives. Understanding how sustainability education operates within specific educational contexts can therefore provide valuable insights for educators, school leaders, policymakers, and curriculum developers seeking to strengthen environmental literacy programs and promote sustainable development goals within basic education.

Given these considerations, this study explored the role of school-based sustainability education in cultivating environmental literacy and responsible citizenship among Grade 4 learners in selected public elementary schools in Aurora, Philippines. Specifically, it examined the sustainability education practices implemented in schools, the environmental learning experiences of learners, the values and behaviors developed through participation in sustainability initiatives, and the factors that facilitate or hinder the successful implementation of sustainability education programs. By generating context-specific insights into environmental literacy development and responsible citizenship formation, the study contributes to the growing body of literature on sustainability education and provides practical implications for strengthening environmental education initiatives within Philippine elementary schools.

Research Questions

This study sought to answer the following questions:

1. What school-based sustainability education practices are implemented among Grade 4 learners in selected elementary schools in Aurora, Philippines?
2. How do sustainability education initiatives contribute to the development of environmental literacy among Grade 4 learners?
3. In what ways do sustainability education experiences cultivate responsible citizenship among learners?
4. What challenges do teachers and schools encounter in implementing sustainability education programs?
5. What enabling factors support the successful implementation of school-based sustainability education initiatives?

Theoretical Framework

This study is anchored on Environmental Literacy Theory and Experiential Learning Theory. Environmental Literacy Theory emphasizes the development of environmental knowledge, attitudes, skills, and behaviors necessary for responsible environmental action. The study also draws from the Experiential Learning Theory of David A. Kolb, which posits that meaningful learning occurs through direct experiences, reflection, conceptualization, and active application. Furthermore, the study is informed by Ecological Systems Theory of Urie Bronfenbrenner, which highlights the influence of school, family, community, and environmental contexts on learner development.

Methodology

The study employed a qualitative multiple-case study design to explore the role of school-based sustainability education in cultivating environmental literacy and responsible citizenship among Grade 4 learners. The research was conducted in selected public elementary schools across the municipalities of Aurora Province. Participants included Grade 4 teachers, learners, and school administrators who were purposively selected based on their involvement in sustainability-related educational activities. Data were gathered through semi-structured interviews, focus group discussions, classroom observations, and analysis of school documents related to

environmental programs and sustainability initiatives. The collected data were analyzed using Braun and Clarke's thematic analysis framework, allowing the identification of recurring themes and patterns concerning environmental literacy development, responsible citizenship formation, and sustainability education practices.

Findings and Discussion

Theme 1: Development of Environmental Awareness Through Contextualized Sustainability Education

One of the major themes that emerged from the study was the development of environmental awareness through contextualized sustainability education. Teachers consistently emphasized that learners became more conscious of environmental issues when classroom discussions were connected to actual environmental conditions within their communities. Sustainability lessons were integrated into classroom instruction through discussions on waste management, biodiversity conservation, climate change, coastal protection, and disaster preparedness. Learners demonstrated increased awareness of environmental concerns affecting their immediate surroundings, particularly those related to improper waste disposal, flooding, deforestation, and coastal degradation.

A Grade 4 teacher shared:

"Mas naiintindihan ng mga bata ang kahalagahan ng kalikasan kapag nakikita nila mismo ang epekto ng basura sa kanilang komunidad. Kapag iniuugnay namin ang aralin sa kanilang karanasan, mas nagiging interesado sila."

Another participant explained:

"Hindi lamang nila natututuhan ang konsepto ng environmental protection. Nakikita nila kung paano ito nakakaapekto sa kanilang pamilya at barangay."

Similarly, a learner stated:

"Natutunan ko po na mahalagang huwag magtapon ng basura kung saan-saan kasi nakakasira ito sa ilog at dagat." These responses indicate that contextualized sustainability education strengthened learners' environmental knowledge and awareness by linking environmental concepts with real-life community experiences. Environmental literacy became more meaningful because learners were able to observe and understand environmental issues within their own contexts.

The findings support previous studies which found that environmental literacy develops more effectively when environmental education is connected to learners' lived experiences and local realities. Research has shown that contextualized environmental learning enhances ecological understanding, environmental sensitivity, and awareness among elementary learners.

Theme 2: Experiential Learning as a Catalyst for Environmental Literacy Development

Another significant theme was the role of experiential learning in strengthening environmental literacy. Schools implemented various sustainability-related activities that allowed learners to engage directly with environmental issues. These activities included school gardening, waste segregation projects, coastal clean-up drives, tree planting activities, recycling programs, and environmental awareness campaigns.

One teacher remarked:

"Mas natututo ang mga bata kapag sila mismo ang gumagawa. Kapag nagtatanim sila o naglilinis ng paligid, mas naiintindihan nila ang kahalagahan ng pangangalaga sa kalikasan."

Another participant stated:

"Hindi sapat ang lecture lamang. Kapag may hands-on activities, mas tumatatak sa kanila ang aralin."

Learners similarly expressed:

"Masaya po kapag nagtatanim kami sa school garden kasi nakikita namin kung paano lumalaki ang mga halaman." "Natutunan ko pong mag-segregate ng basura dahil ginagawa namin ito araw-araw sa paaralan."

These experiences demonstrate that sustainability education becomes more effective when learners actively participate in environmental activities rather than merely receiving information. Through direct engagement, learners developed practical environmental skills and stronger ecological understanding.

The findings align with Experiential Learning Theory, which posits that meaningful learning occurs through concrete experiences and active participation. Studies have likewise shown that experiential environmental education significantly improves environmental literacy, scientific attitudes, and ecological responsibility among elementary learners.

Theme 3: Cultivation of Pro-Environmental Behaviors and Ecological Responsibility

The findings further revealed that sustainability education contributed to the development of pro-environmental behaviors and ecological responsibility among learners. Teachers observed noticeable changes in students' environmental practices both inside and outside the classroom. Learners became more conscious about proper waste disposal, resource conservation, recycling, and environmental cleanliness.

One teacher shared:

"Napansin namin na mas naging responsable sila sa pagtatapon ng basura at pag-aalaga ng mga halaman sa

paaralan.”

Another participant explained:

“Kahit sa bahay, sinasabi ng mga magulang na pinapaalalahanan sila ng mga bata tungkol sa segregation at pagtitipid ng tubig.”

A learner stated:

“Kapag may nakikita po akong basura, pinupulot ko na kasi natutunan namin na dapat alagaan ang kalikasan.”

Another learner shared:

“Sinasabihan ko rin po ang mga kapatid ko na huwag magsayang ng tubig.”

These responses indicate that sustainability education influenced not only environmental knowledge but also actual environmental behaviors and attitudes. Learners demonstrated greater personal responsibility toward environmental conservation and exhibited behaviors consistent with environmental stewardship.

The findings support studies emphasizing that environmental literacy extends beyond cognitive understanding and includes behavioral and affective dimensions. Research has shown that environmental education programs significantly improve environmental conservation attitudes, ecological responsibility, and pro-environmental behaviors among elementary learners.

Theme 4: Sustainability Education as a Foundation for Responsible Citizenship

A central theme that emerged was the role of sustainability education in cultivating responsible citizenship. Teachers emphasized that environmental education encouraged learners to recognize their responsibilities not only toward the environment but also toward their communities. Sustainability initiatives promoted cooperation, volunteerism, social responsibility, and civic participation among learners.

One participant explained:

“Hindi lamang tungkol sa kalikasan ang natututuhan nila. Natututo rin silang maging responsable sa komunidad.”

Another teacher stated:

“Kapag may clean-up drive o environmental project, nakikita nila na may ambag sila sa ikabubuti ng kanilang lugar.”

Learners likewise expressed:

“Masaya po kapag tumutulong kami sa paglilinis ng paligid kasi nakakatulong kami sa barangay.”

“Natutunan ko po na kailangan nating magtulungan para mapanatiling malinis ang aming komunidad.”

These responses suggest that sustainability education strengthened learners’ sense of social responsibility and civic engagement. Through participation in environmental projects, learners developed awareness that their actions contribute to community well-being and environmental sustainability.

The findings support emerging perspectives on environmental citizenship, which emphasize the integration of environmental responsibility, civic participation, and social accountability. Educational models for environmental citizenship highlight the importance of engaging learners in participatory environmental actions that promote both ecological stewardship and responsible community involvement.

Theme 5: Challenges in Implementing Sustainability Education Programs

Despite the positive outcomes, participants identified several challenges affecting the implementation of sustainability education initiatives. Teachers reported limited instructional materials, insufficient funding, inadequate environmental learning resources, and time constraints within the curriculum.

One teacher disclosed:

“Minsan kulang ang materials para sa environmental projects kaya kailangan naming maging malikhain.”

Another participant stated:

“May mga programa kami pero limitado ang budget para mas mapalawak pa ang activities.”

Teachers further shared:

“Hindi lahat ng environmental concepts ay madaling maituro dahil kulang ang available na resources.”

“Kailangan pa ng mas maraming training para sa sustainability education.”

These responses indicate that schools continue to face structural and resource-related barriers that affect the sustainability and expansion of environmental education initiatives.

The findings are consistent with previous studies which identified limited resources, inadequate instructional support, and insufficient professional development as common challenges in implementing sustainability education within elementary schools.

Theme 6: School-Community Partnerships and Teacher Innovation as Enabling Factors

The final theme highlighted the importance of school-community partnerships and teacher innovation in sustaining environmental literacy programs. Teachers frequently collaborated with parents, local government units, environmental organizations, and community stakeholders to strengthen sustainability initiatives.

One teacher explained:

“Malaking tulong ang suporta ng barangay at mga magulang sa mga environmental activities namin.”

Another participant stated:

“Kapag may tree planting at clean-up drive, kasama namin ang komunidad kaya mas nagiging matagumpay ang programa.”

A school administrator remarked:

“Nagiging mas makabuluhan ang sustainability education kapag nakikita ng mga bata na sama-samang kumikilos ang paaralan at komunidad.”

Teachers also demonstrated innovation by developing localized environmental learning materials, integrating indigenous ecological knowledge, and utilizing locally available resources in environmental projects.

The findings suggest that strong community involvement and teacher creativity serve as critical enabling factors in promoting environmental literacy and responsible citizenship. Such collaborative approaches strengthen the relevance, sustainability, and impact of environmental education initiatives.

The findings support ecological and community-based educational perspectives which emphasize that learner development is influenced by interactions among schools, families, communities, and environmental contexts. Studies further indicate that community-supported sustainability programs contribute significantly to environmental awareness, environmental responsibility, and long-term ecological engagement among learners.

Conclusion

The study revealed that school-based sustainability education plays a significant role in cultivating environmental literacy and responsible citizenship among Grade 4 learners in selected public elementary schools in Aurora, Philippines. Sustainability-focused educational practices enhanced learners' environmental awareness, ecological understanding, environmental responsibility, and civic engagement through contextualized, experiential, and community-oriented learning experiences. Activities such as school gardening, waste segregation programs, tree planting initiatives, environmental campaigns, and community clean-up projects provided meaningful opportunities for learners to connect environmental concepts with real-life situations. These experiences encouraged the development of pro-environmental behaviors, environmental stewardship, and social responsibility.

Furthermore, sustainability education contributed to the formation of responsible citizenship by promoting cooperation, community participation, volunteerism, and collective responsibility toward environmental protection. While challenges related to limited resources, insufficient instructional materials, and professional development constraints were identified, schools demonstrated resilience through teacher innovation and community collaboration. The findings underscore the importance of integrating sustainability education within elementary curricula as a transformative approach for developing environmentally literate, socially responsible, and civically engaged learners capable of contributing to sustainable community development.

Implications for Practice

The findings suggest several important implications for educational policy, curriculum development, and instructional practice. First, schools should strengthen the integration of sustainability education across learning areas to ensure that environmental literacy becomes a consistent component of elementary education. Second, experiential and community-based environmental learning activities should be institutionalized to provide learners with authentic opportunities to apply environmental knowledge and develop responsible behaviors. Third, professional development programs should be provided to equip teachers with competencies in environmental education, sustainability pedagogy, and contextualized instructional design. Fourth, stronger partnerships among schools, local government units, environmental organizations, and community stakeholders should be established to support sustainability initiatives and environmental literacy programs. Finally, policymakers and educational leaders should allocate adequate resources for environmental education materials, school sustainability projects, and community-based environmental learning experiences to strengthen the development of environmentally responsible citizens within basic education.

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