

Bridging Education and Community Evaluation: Assessing the Effectiveness of Initao College's Environmental Education Initiatives for Sustainability

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ABSTRACT

This study examines the effectiveness of Initao College's environmental education initiatives through the perspectives of both students and community members. Anchored on a quantitative correlational-comparative research design, the study investigates how environmental programs are implemented via curriculum-based activities, community engagement projects, and institutional support, as well as how these initiatives are perceived in terms of environmental impact, community satisfaction, and sustainability. Data were collected from 120 third-year students—30 from each of the four programs—and 30 community members from areas where the initiatives were conducted, selected through random sampling. The study highlights the local context of Purok 3, Barangay Apas, and the coastal road of Poblacion, emphasizing community-specific ecological challenges such as plastic pollution, tree survival, and coastal degradation. Findings are expected to reveal differences in perception between students and community members, identify program strengths and areas for improvement, and provide insights into how school-led initiatives can effectively foster environmental awareness, sustainable practices, and active participation. In response to these findings, the study proposes the LIMPYO Program (Learn, Implement, Maintain, Protect, Yields Outcomes), a student-led, RDES-facilitated initiative integrating plastic collection, tree planting, and community education. Students are required to monitor and care for the trees they plant from entry until graduation, while recycled plastics fund tree maintenance and coastal cleaning. By linking education, action, and long-term sustainability, the LIMPYO Program strengthens Initao College's environmental initiatives, fosters ecological responsibility, and empowers students and community members to actively engage in local environmental stewardship and sustainable development.

Keywords: Environmental Education, Community Engagement, Student-Led Initiatives, Sustainability, LIMPYO Program

Introduction

Environmental education (EE) has emerged as a critical strategy for fostering sustainability, ecological literacy, and responsible citizenship among learners. In the Philippines, the government has demonstrated a strong commitment to environmental education through Republic Act No. 9512, also known as the Environmental Awareness and Education Act of 2008, which mandates the integration of environmental concepts at all levels of education to promote environmental literacy and sustainable practices [1]. These mandates align with global efforts, particularly the United Nations Sustainable Development Goals (SDGs), such as SDG 4 (Quality Education) and SDG 13 (Climate Action), emphasizing the role of education in preparing students to respond effectively to environmental challenges.

Recent research highlights the positive impact of EE on

students' understanding, attitudes, and sustainability practices. For example, sustainability-integrated ecology lessons for Grade 11 students have been shown to meaningfully improve both conceptual understanding of ecological issues and attitudes toward sustainable development [2]. In higher education, student leaders demonstrate very high environmental ethics awareness, though their participation in environmental citizenship activities is moderate [3]. In Philippine secondary schools, experiential-reflective instruction has been found to enhance knowledge retention and engagement in sustainability topics [4]. Furthermore, integrating sustainability competencies—or "green skills"—into teacher education shows promise, with cooperating teachers exhibiting higher engagement in fostering these competencies than trainee student teachers [5].

Theoretical perspectives on meaningful learning further reinforce the importance of effective EE. According to Ausubel (1968), learning is most enduring when new knowledge connects with learners' existing cognitive structures. Contemporary

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interpretations emphasize that prior knowledge and structured, experiential pedagogies enhance comprehension and long-term retention [6]. Complementing these ideas, Mezirow's Transformative Learning Theory argues that learning becomes deeper and more impactful when individuals critically reflect on their assumptions and engage in experiences that challenge existing perspectives [7]. In the context of sustainability education, this suggests that EE initiatives produce stronger outcomes when they not only connect with students' prior experiences but also provide reflective, community-centered activities that promote shifts in attitudes, values, and environmental behaviors.

Despite these advances, there is a lack of research evaluating the effectiveness of environmental education initiatives at Initao College, particularly regarding how these programs translate into student outcomes and community impact. Bridging education with community evaluation is essential to determine whether EE initiatives foster meaningful sustainability practices, ecological responsibility, and active participation in local environmental projects. This study, therefore, seeks to assess the effectiveness of Initao College's environmental education initiatives for sustainability, providing insights into both student learning outcomes and broader community engagement.

To address this research gap, the study seeks to answer the following questions:

1. How are Initao College's environmental education initiatives implemented in terms of:
 - a. Curriculum-based environmental programs,
 - b. Community engagement activities, and
 - c. Institutional support and partnerships?
2. How do members of the community evaluate the effectiveness of these initiatives in terms of:
 - a. Perceived environmental impact,
 - b. Community satisfaction and appreciation, and
 - c. Perceived sustainability and continuity?
3. Is there a significant relationship between the implementation of environmental education initiatives and community evaluation of their effectiveness?
4. Is there a significant difference in the perception of students and community members regarding the implementation of Initao College's environmental education initiatives?
5. Is there a significant difference in how students and community members evaluate the effectiveness of these initiatives in terms of perceived impact, satisfaction, and sustainability?

The purpose of this research is to systematically evaluate Initao College's environmental initiatives from both educational and community perspectives. The findings aim to provide a framework for enhancing environmental education strategies within higher education institutions, particularly those in rural settings. By identifying strengths and areas for improvement, this study will help educators and policymakers design more impactful, inclusive, and community-centered sustainability programs. Ultimately, it underscores the vital role of education as a catalyst for long-term environmental stewardship and sustainable development.

To further situate this study within the Philippine context, recent research highlights how teachers' attitudes, institutional support,

community engagement, and student participation influence the effectiveness of environmental education initiatives.

Recent Philippine studies show how teachers' attitudes and institutional support shape the integration of sustainability in higher education curricula. Duran and Mariñas demonstrate, through Structural Equation Modeling, that teachers' attitudes toward sustainability strongly predict their intention to embed environmental concepts, while institutional support plays a crucial enabling role [8]. Quirino finds that faculty members consistently engage in environmental mitigation actions, indicating that their personal values reinforce their professional commitment to environmental education [9]. These findings suggest that the effectiveness of curriculum-based environmental programs depends not only on program design but also on educators' intrinsic motivation and institutional backing.

Community engagement and extension initiatives play a key role in translating environmental education into tangible local impact. Galorio uses grounded theory to explore sustainability in community extension programs, emphasizing the importance of long-term partnerships and clear implementation strategies [10]. Domasian et al. evaluate a solid-waste management program and find that hands-on workshops significantly improve community knowledge, attitudes, and behaviors [11]. Garcia and Uy Jr. highlight that extension implementers are driven by a strong sense of social responsibility and passion for service, yet they also encounter constraints such as limited funding, scheduling conflicts, and varying levels of community engagement; they respond to these challenges through resourcefulness, clear communication, goal-setting, and maintaining work-life balance [12]. Collectively, these studies underscore the importance of structured, community-centered approaches in environmental education.

Teacher preparation and student engagement in sustainability education further reinforce environmental outcomes. Pecson and Zabala report that cooperating teachers actively promote sustainability competencies, leading to greater student involvement in ecological activities [5]. Likewise, Ramadani et al. emphasize that pre-service teachers are emerging partners in climate and health education, though many still require more experiential and practice-based training to effectively engage learners [13]. Furthermore, Treviño and Carrasco highlight that school-level practices—such as open discussion and action-oriented learning—significantly influence students' willingness to act pro-environmentally in the future [14]. Together, these studies show that strong teacher preparation and participatory learning environments enhance environmental knowledge, attitudes, and sustainable behaviors among students.

Recent research emphasizes the crucial role of higher education institutions in fostering environmental sustainability through curriculum, student engagement, and institutional frameworks. Baniaga found that Philippine HEIs face significant challenges in achieving meaningful sustainability outcomes due to limited institutional support, inconsistent collaboration with external partners, and gaps in stakeholder engagement. His study showed that partnerships with LGUs, NGOs, and community organizations often struggle with misaligned expectations, weak coordination, and insufficient resource-sharing—issues that reduce the impact

of sustainability initiatives [15]. At the student level, Masongsong found that environmental awareness and participation are significantly shaped by visible and well-structured sustainability initiatives on campus, showing that student engagement increases when programs are accessible and actively promoted [16]. Building on institutional strategies, Carungay et al. proposed a sustainability framework that underscores the need for coherent planning, governance alignment, and collaborative partnerships to strengthen the overall impact of sustainability practices within universities [17].

Beyond structural models, other scholars have explored how sustainability involvement influences competencies and engagement across campus communities. Noor et al. demonstrated that participating in campus sustainability activities develops essential competencies such as leadership, collaboration, and problem-solving, positioning sustainability efforts as vital learning experiences rather than isolated environmental actions [18]. Complementing this, Manalo and Manalo examined faculty engagement and reported that supportive policies, institutional encouragement, and access to resources are critical factors in promoting active faculty involvement in environmental programs [19]. Together, these studies illustrate that sustainability in higher education thrives when curriculum, student initiatives, faculty participation, and institutional structures are aligned toward a common environmental vision.

Methodology

This study employed a quantitative correlational-comparative design to examine the implementation and effectiveness of Initao College's environmental education initiatives from both student and community perspectives. The correlational component explored the relationship between the implementation of environmental initiatives and community evaluation of their effectiveness, while the comparative component investigated whether significant differences existed between the perceptions of students and community members regarding both the implementation and perceived effectiveness of these initiatives. This design was chosen because it allows researchers to identify relationships between variables without manipulation while also comparing responses across independent groups.

The study was conducted among third-year students of Initao College enrolled during the academic year 2024–2025, along with members of the local community who actively participated in the college's environmental programs. A total of 120 students were selected using random sampling to ensure fair representation across different academic programs, while 30 community members were purposively selected to include those with direct experience in the initiatives. All respondents were fully informed of the study's purpose and participated voluntarily after giving their consent.

Data were collected using a researcher-designed questionnaire consisting of six major constructs: Curriculum-Based Environmental Programs, Community Engagement Activities, Institutional Support and Partnerships, Perceived Environmental Impact, Community Satisfaction and Appreciation, and Perceived Sustainability and Continuity. Each construct contained five items, designed to be answered by both students and community

members. Items were rated on a 4-point Likert scale ranging from Less Effective to Very Effective, enabling quantifiable assessment of perceptions. The instrument underwent content validation by three experts from the Research and Extension Services Department of Initao College (IC-OVPRDES) to ensure clarity, relevance, and appropriateness. Recommendations from the experts were incorporated prior to finalizing the questionnaire. A pilot test was administered to a small group of students not included in the main sample to assess the instrument's reliability. The items in Part I are grouped into three constructs: curriculum-based environmental programs (5 items, reliability index = .948, excellent), community engagement activities (5 items, reliability index = .933, excellent), and institutional support and partnerships (5 items, reliability index = .929, excellent). This section has an overall reliability index of .960, indicating excellent consistency. Part II measures the community's evaluation of the effectiveness of the college's environmental initiatives through three constructs: perceived environmental impact (5 items, reliability index = .953, excellent), community satisfaction and appreciation (5 items, reliability index = .949, excellent), and perceived sustainability and continuity (5 items, reliability index = .961, excellent). The total reliability index for this section is .969, considered excellent. Overall, the entire instrument has a reliability index of .981, signifying excellent internal consistency and confirming that the tool is highly reliable for measuring the constructs in the study.

Data collection commenced after securing approval from the Research Office of Initao College and coordination with local community leaders. The following official documents were prepared and obtained prior to data collection: IC-OVPRDES: 006 Consent Form for Conducting Survey, IC-OVPRDES: 007 Communication Letter to Business Owner/Barangay Captain/Principal, and IC-OVPRDES: 008 Informed Consent Form for Survey. Questionnaires were distributed via printed copies for community respondents and Google Forms for students to ensure accessibility and convenience. Respondents were given sufficient time to complete the questionnaires. Upon collection, all responses were carefully checked for completeness and accuracy, then securely encoded and organized. Respondent anonymity and confidentiality were strictly maintained throughout the process.

For data analysis, descriptive statistics, specifically the weighted mean, were used to summarize the perceptions of students and community members regarding the implementation and effectiveness of the environmental initiatives. To determine the relationship between the implementation of initiatives and community evaluation of their effectiveness, Spearman's Rank-Order Correlation Coefficient was employed, as the data were ordinal and did not assume normal distribution. To examine differences in perceptions between students and community members, Independent t-tests were applied for data meeting parametric assumptions, while the Mann-Whitney U test was used as a non-parametric alternative when assumptions were not met. All statistical analyses were conducted using Jamovi, with results interpreted at a 0.05 level of significance, ensuring a standard threshold for determining statistical reliability.

This approach allowed the study to thoroughly assess both the implementation and perceived effectiveness of environmental

education initiatives, providing insights into the relationship between program execution and community evaluation, as well as highlighting potential differences between student and community perceptions.

Results

This study examines the implementation and effectiveness of environmental education initiatives at Initao College. It investigates how curriculum-based programs, community engagement activities, and institutional support and partnerships are carried out, as well as how the community evaluates

these initiatives in terms of perceived environmental impact, satisfaction and appreciation, and sustainability. By analyzing these aspects, the study aims to understand the role of these initiatives in fostering students' environmental awareness and responsibility while providing insights to guide the institution in improving and planning future programs.

Problem 1: How are Initao College's environmental education initiatives implemented in terms of Curriculum-based environmental programs, Community engagement activities, and Institutional support and partnership?

Table 1: Initao College's Environmental Education Initiatives Implemented in Terms of Curriculum-Based Environmental Programs

Indicator	Respondents	Mean	SD	Description	Interpretation
The environmental programs of Initao College are effective in increasing awareness about sustainability.	Student Community	2.92 1.57	0.60 0.57	Effective Slightly Effective	High Low
The activities promote understanding of sustainability and conservation.	Student Community	3.00 1.50	0.54 0.51	Effective Slightly Effective	High Low
The programs are effective in relating environmental concepts to real-life community issues.	Student Community	2.97 1.57	0.65 0.50	Effective Slightly Effective	High Low
The initiatives effectively encourage participation in environmental conservation.	Student Community	3.06 1.47	0.54 0.51	Effective Less Effective	High Very Low
The environmental education programs are effective in developing responsible attitudes toward nature.	Student Community	3.13 1.50	0.57 0.56	Effective Slightly Effective	High Low
Total Mean Score	Student Community	3.02 1.52	0.45 0.33	Effective Slightly Effective	High Low

Legend: 1.00 - 1.49 = Less Effective; 1.50 - 2.49 = Slightly Effective; 2.50 - 3.49 = Effective; 3.50 - 4.00 = Very Effective

The results indicated a substantial difference in how students and community members evaluated the effectiveness of Initao College's curriculum-based environmental programs. The students reported a High level of effectiveness across all indicators, with a total mean score of 3.02 (SD 0.45), which was described as "Effective." The highest mean score for students was 3.13 for "developing responsible attitudes toward nature." Conversely, the community reported a Low level of effectiveness overall, with a total mean score of 1.52 (SD 0.33), described as "Slightly Effective." The lowest mean score reported by the community was 1.47 for the indicator concerning "encouraging participation in environmental conservation," which was interpreted as Very Low.

Table 2: Initao College's Environmental Education Initiatives Implemented in Terms of Community Engagement Activities

Indicator	Respondents	Mean	SD	Description	Interpretation
The environmental activities are effectively planned and organized.	Student Community	3.08 1.40	0.59 0.50	Effective Less Effective	High Very Low
The activities effectively promote cooperation between students and community members.	Student Community	2.98 1.53	0.61 0.57	Effective Slightly Effective	High Low
The programs are effective in improving the cleanliness and beauty of the community.	Student Community	3.02 1.40	0.57 0.50	Effective Less Effective	High Very Low
The initiatives effectively build partnerships between the school and the community.	Student Community	3.02 1.50	0.61 0.51	Effective Slightly Effective	High Low
The environmental activities are effective in encouraging active involvement of participants.	Student Community	3.06 1.23	0.56 0.43	Effective Less Effective	High Very Low
Total Mean Score	Student Community	3.03 1.41	0.45 0.28	Effective Less Effective	High Very Low

Legend: 1.00 - 1.49 = Less Effective; 1.50 - 2.49 = Slightly Effective; 2.50 - 3.49 = Effective; 3.50 - 4.00 = Very Effective

The results indicated a substantial difference in how students and community members evaluated the effectiveness of Initao College's community engagement activities. The total Mean Score for students was 3.03 (SD 0.45), indicating an "Effective" description and a High interpretation of the program's implementation and community relations. The students' Highest Mean Score was 3.08 for the programs being "effectively planned and organized." In contrast, the community reported a Total Mean Score of 1.41 (SD 0.28), interpreted as "Very Low" and described as "Less Effective." The community gave the lowest rating 1.23 to the indicator that activities were "effective in encouraging active involvement of participants," which was interpreted as "Very Low." The community also rated the effectiveness of planning/organization and improving community cleanliness as 1.40 (Very Low).

Table 3: Initao College's Environmental Education Initiatives Implemented in Terms of Institutional Support and Partnerships

Indicator	Respondents	Mean	SD	Description	Interpretation
Initao College is effective in providing adequate resources to support environmental programs.	Student Community	3.02 1.33	0.59 0.48	Effective Less Effective	High Very Low
The administration is effective in demonstrating leadership in promoting sustainability.	Student Community	2.96 1.30	0.57 0.47	Effective Less Effective	High Very Low
The partnerships between the school and local organizations are effective in achieving program goals.	Student Community	3.04 1.43	0.63 0.50	Effective Less Effective	High Very Low
The institution is effective in ensuring community participation in environmental projects.	Student Community	3.03 1.43	0.55 0.50	Effective Less Effective	High Very Low
The school's overall support system is effective in maintaining successful environmental initiatives.	Student Community	2.98 1.47	0.66 0.51	Effective Less Effective	High Very Low
Total Mean Score	Student Community	3.01 1.39	0.51 0.28	Effective Less Effective	High Very Low

Legend: 1.00 - 1.49 = Less Effective; 1.50 - 2.49 = Slightly Effective; 2.50 - 3.49 = Effective; 3.50 - 4.00 = Very Effective

The results indicated a substantial difference in how students and community members perceived the effectiveness of Initao College's institutional support and partnerships. The students reported a high level of effectiveness across all indicators, with a Total Mean Score of 3.01 (SD 0.51), which was described as "Effective." The highest mean score for students was 3.04 for the effectiveness of the partnership between the college and local organizations in achieving program goals. In contrast, the community reported a Very Low level of effectiveness overall, with a Total Mean Score of 1.39 (SD 0.28), described as "Less Effective." The lowest mean score reported by the community was 1.33 for the indicator concerning Initao College providing adequate resources to support environmental programs, which was interpreted as Very Low.

Problem 2: How do members of the community evaluate the effectiveness of these initiatives in terms of Perceived environmental impact, Community satisfaction and appreciation, and Perceived sustainability and continuity?

Table 4: Community Evaluation of the Initiatives' Effectiveness in Terms of Perceived Environmental Impact

Indicator	Respondents	Mean	SD	Description	Interpretation
The initiatives are effective in improving the community's environmental condition.	Student Community	3.08 1.40	0.57 0.50	Effective Less Effective	High Very Low
The programs are effective in reducing waste and pollution in the area.	Student Community	3.05 1.53	0.57 0.56	Effective Slightly Effective	High Low
The initiatives are effective in raising environmental awareness among community members.	Student Community	3.00 1.47	0.57 0.51	Effective Less Effective	High Very Low
The projects are effective in restoring greenery and promoting environmental cleanliness.	Student Community	2.99 1.23	0.54 0.43	Effective Less Effective	High Very Low
The environmental initiatives are effective in protecting natural resources.	Student Community	3.06 1.47	0.56 0.68	Effective Less Effective	High Very Low
Total Mean Score	Student Community	3.04 1.42	0.46 0.30	Effective Less Effective	High Very Low

Legend: 1.00 - 1.49 = Less Effective; 1.50 - 2.49 = Slightly Effective; 2.50 - 3.49 = Effective; 3.50 - 4.00 = Very Effective

The findings demonstrated a notable difference in how students and community members evaluated the perceived environmental impact of Initao College's initiatives. The students reported a high level of effectiveness across all indicators, with a Total Mean Score of 3.04 (SD 0.46), which was described as "Effective." The highest mean score for students was 3.08 for the initiatives being effective in improving the community's environmental condition. However, the community reported a Very Low level of effectiveness overall, with a Total Mean Score of 1.42 (SD 0.30), described as "Less Effective." The lowest mean score reported by the community was 1.23 for the indicator concerning the projects restoring greenery and promoting environmental cleanliness, which was interpreted as Very Low.

Table 5: Community Evaluation of the Initiatives' Effectiveness in Terms of Community Satisfaction and Appreciation

Indicator	Respondents	Mean	SD	Description	Interpretation
The community finds the initiatives effective in addressing local environmental needs.	Student Community	3.08 1.40	0.54 0.50	Effective Less Effective	High Very Low
The programs are effective in showing the college's commitment to environmental care.	Student Community	3.05 1.50	0.55 0.51	Effective Slightly Effective	High Low
The initiatives are effective in building goodwill between the college and the community.	Student Community	3.00 1.50	0.55 0.51	Effective Slightly Effective	High Low
The activities are effective in earning appreciation and support from community members.	Student Community	3.05 1.47	0.58 0.51	Effective Less Effective	High Very Low
The initiatives are effective in creating a positive image of the college in the community.	Student Community	3.04 1.37	0.54 0.50	Effective Less Effective	High Very Low
Total Mean Score	Student Community	3.04 1.45	0.45 0.28	Effective Less Effective	High Very Low

Legend: 1.00 - 1.49 = Less Effective; 1.50 - 2.49 = Slightly Effective; 2.50 - 3.49 = Effective; 3.50 - 4.00 = Very Effective

The findings revealed a notable difference in how students and community members perceived the effectiveness of the initiatives in terms of community satisfaction and appreciation. The students reported a high level of effectiveness across all indicators, with a Total Mean Score of 3.04 (SD 0.45), which was described as "Effective." The highest mean score for students was 3.08 for the activities being effective in addressing local environmental needs. On the other hand, the community reported a Very Low level of effectiveness overall, with a Total Mean Score of 1.45 (SD 0.28), described as "Less Effective." The lowest mean score reported by the community was 1.37 for the indicator concerning the initiatives creating a positive image of the college in the community, which was interpreted as Very Low.

Table 6: Community Evaluation of the Initiatives' Effectiveness in Terms of Perceived Sustainability and Continuity

Indicator	Respondents	Mean	SD	Description	Interpretation
The environmental initiatives are effective in promoting long-term environmental practices.	Student Community	3.10 1.43	0.54 0.50	Effective Less Effective	High Very Low
The programs are effective in encouraging continued support from the community.	Student Community	2.99 1.47	0.53 0.51	Effective Less Effective	High Very Low
The initiatives are effective in inspiring future environmental projects.	Student Community	3.07 1.37	0.56 0.49	Effective Less Effective	High Very Low
The programs are effective in sustaining positive environmental change over time.	Student Community	2.97 1.43	0.59 0.50	Effective Less Effective	High Very Low
The initiatives are effective in serving as a model for other schools or communities.	Student Community	3.11 1.33	0.56 0.48	Effective Less Effective	High Very Low
Total Mean Score	Student Community	3.05 1.41	0.44 0.27	Effective Less Effective	High Very Low

Legend: 1.00 - 1.49 = Very Low; 1.50-2.49 = Low; 2.50-3.49 = High; 3.50-4.00 = Very High

The results highlighted a clear difference in perceptions between students and community members regarding the effectiveness of the initiatives in promoting sustainability and continuity. The students reported a high level of effectiveness across all indicators, with a Total Mean Score of 3.05 (SD 0.44), which was described as "Effective." The highest mean score for students was 3.11 for

the initiatives being effective in serving as a model for other schools or communities. By contrast, the community reported a Very Low level of effectiveness overall, with a Total Mean Score of 1.41 (SD 0.27), described as “Less Effective.” The lowest mean score reported by the community was 1.33 for the indicator concerning the initiatives serving as a model for other schools or communities, which was interpreted as Very Low.

Problem 3: Is there a significant relationship between the implementation of environmental education initiatives and community evaluation of their effectiveness?

Table 7: Significant relationship Between the Implementation of Environmental Education Initiatives and Community Evaluation of Their Effectiveness

Variables		rs value	df	p-value	Remarks
Curriculum-based Environmental Programs	Perceived Environmental Impact	0.726	148	<.001	Significant
	Community Satisfaction and Appreciation	0.758	148	<.001	Significant
	Perceived Sustainability and Continuity	0.751	148	<.001	Significant
Community Engagement Activities	Perceived Environmental Impact	0.829	148	<.001	Significant
	Community Satisfaction and Appreciation	0.813	148	<.001	Significant
	Perceived Sustainability and Continuity	0.786	148	<.001	Significant
Institutional Support and Partnerships	Perceived Environmental Impact	0.877	148	<.001	Significant
	Community Satisfaction and Appreciation	0.849	148	<.001	Significant
	Perceived Sustainability and Continuity	0.861	148	<.001	Significant
Initao College's Environmental Education Initiatives	Community Evaluation of Initiatives Effectiveness	0.869	148	<.001	Significant

Note: Results are considered statistically significant at a p-value of <0.05

The analysis showed a strong, positive, and statistically significant relationship between the implementation of Initao College's environmental education initiatives and the community's evaluation of their effectiveness ($r_s = 0.869$, $p < .001$). For Curriculum-based Environmental Programs, significant correlations were found with Perceived Environmental Impact ($r_s = 0.726$, $p < .001$), Community Satisfaction and Appreciation ($r_s = 0.758$, $p < .001$), and Perceived Sustainability and Continuity ($r_s = 0.751$, $p < .001$). For Community Engagement Activities, significant correlations were observed with Perceived Environmental Impact ($r_s = 0.829$, $p < .001$), Community Satisfaction and Appreciation ($r_s = 0.813$, $p < .001$), and Perceived Sustainability and Continuity ($r_s = 0.786$, $p < .001$). For Institutional Support and Partnerships, the strongest correlations were found with Perceived Environmental Impact ($r_s = 0.877$, $p < .001$), Community Satisfaction and Appreciation ($r_s = 0.849$, $p < .001$), and Perceived Sustainability and Continuity ($r_s = 0.861$, $p < .001$). These results indicate that higher implementation of all environmental education initiatives was associated with more favorable community evaluations across all effectiveness measures.

Problem 4: Is there a significant difference in the perception of students and community members regarding the implementation of Initao College's environmental education initiatives?

Table 8: Significant Differences in Perceptions of Students and Community Members Regarding the Implementation of Initao College's Environmental Education Initiatives

	Profile	Environmental Education Initiatives		Test Statistic-value	P-value	Remarks
		Mean	QI			
Respondents	Student	3.02	H	2.00	<.001	Significant
	Community	1.44	VL			

Note: Results are considered statistically significant at a p-value of <0.05.

The results demonstrated a statistically significant difference between the students' and community members' perceptions of implementation effectiveness ($p < .001$, Test Statistic = 2.00, Remarks: Significant). Students reported a composite mean score of 3.02, interpreted as High (H). Community members reported a composite mean score of 1.44, interpreted as Very Low (VL).

Problem 5: Is there a significant difference in how students and community members evaluate the effectiveness of these initiatives in terms of perceived impact, satisfaction, and sustainability?

Table 9: Significant Difference in how Differences in How Students and Community Members Evaluate the Effectiveness of Initiatives in Terms of Perceived Impact, Satisfaction, and Sustainability

	Profile	Environmental Education Initiatives		Test Statistic-value	P-value	Remaks
		Mean	QI			
Respondents	Student	3.04	H	1.50	001.≥	Significant
	Community	1.42	VL			

Note: Results are considered statistically significant at a p-value of <0.05.

The results presented the findings on the difference in how students and community members evaluated the effectiveness of the initiatives in terms of Perceived Impact, Satisfaction, and Sustainability. The analysis showed a statistically significant difference between the two respondent groups ($p \leq .001$, Test Statistic = 1.50, Remarks: Significant). Students reported a composite mean score of 3.04, interpreted as High (H). Community members reported a composite mean score of 1.42, interpreted as Very Low (VL).

Discussion

The results in Table 1 reveals a notable disparity between students' high evaluations and the community's comparatively lower assessments of Initao College's environmental programs, indicating a gap between the perceived effectiveness of curricular initiatives and their tangible impact on the surrounding community. This discrepancy suggests that while students may gain awareness and understanding of sustainability through the college's curriculum, the translation of this knowledge into meaningful community engagement remains limited. Supporting this observation, Oe, Yamaoka, and Ochiai emphasized that community-based learning strategies can significantly enhance environmental awareness and foster pro-environmental behavior among local residents, highlighting the importance of linking educational content with real-world application [20]. Similarly, Corpuz et al. noted that despite the integration of environmental education within teacher preparation programs, students often face challenges in applying these competencies to practical initiatives that benefit the community [21]. Taken together, these findings imply that incorporating participatory, community-focused components—such as service-learning projects, collaborative environmental campaigns, or hands-on sustainability activities—into Initao College's programs may help align students' positive attitudes with observable environmental outcomes in the wider community.

Also, Table 2 shows a significant contrast between students' high evaluation and the community's very low evaluation of Initao College's community engagement initiatives. This disparity suggests that while students perceive these programs as effective learning opportunities, the initiatives may not sufficiently incorporate community perspectives or meaningful participatory approaches. The notably low ratings on indicators such as active involvement, planning, and organization indicate that community members feel marginalized in decision-making and implementation processes, which can reduce the programs' practical relevance and social impact. This aligns with the findings of Marzo et al., who argue that sustainable development outcomes are closely tied to robust community participation, and with Prastiwi et al., who show that programs designed through

partnerships and focused on community needs foster higher levels of engagement and social responsibility [22,23]. These results imply that for Initao College's initiatives to achieve both educational and social objectives, it is crucial to integrate co-created planning, collaborative implementation strategies, and formal mechanisms for local input. By doing so, the college can not only enhance the effectiveness of its programs but also ensure that student perceptions of impact are more closely aligned with the lived experiences and expectations of the community.

Additionally, the results in Table 3 reveal a pronounced gap between students' and community members' perceptions of institutional support and partnerships. While students perceive these initiatives as effective, the community rates them very low, highlighting a disconnect between the college's internal assessment and the community's actual experience. The community's low ratings suggest that local stakeholders may feel the college is not providing sufficient resources or fully leveraging its relationships with local organizations, indicating that these partnerships may be largely symbolic rather than substantively collaborative. This concern reflects the observations of Bringle and Hatcher, who argue that campus–community partnerships must move beyond token involvement and toward genuine co-creation to achieve meaningful impact [24]. These findings imply that, despite strong internal efforts, the impact of the college's partnerships is not fully recognized or experienced by the community. To bridge this gap, Initao College should strengthen co-development mechanisms with local organizations, ensuring that planning, resource allocation, and institutional support respond directly to community needs. Strategies such as participatory planning sessions, collaborative projects, and transparent communication channels can foster more equitable and mutually beneficial partnerships. This interpretation aligns with the work of Bowser et al., who emphasize that inclusive governance, cross-sector engagement, and shared decision-making are essential components of effective sustainability partnerships in higher education [25]. Their study demonstrates that when institutions collaborate transparently and meaningfully with diverse external stakeholders, initiatives become more sustainable, impactful, and positively perceived. By addressing this disconnect, Initao College can enhance trust, optimize resource use, and cultivate partnerships that are not merely formal agreements but truly collaborative and beneficial to both the institution and the community.

Moreover, the results in Table 4 highlight a striking discrepancy between students' and community members' perceptions of Initao College's environmental initiatives. While students rate the environmental impact as high, community members perceive it as very low, suggesting that the programs, although

well-intentioned, do not translate into visible or meaningful environmental change such as improved cleanliness, greener surroundings, or tangible sustainability outcomes. This gap points to a misalignment between the college's institutional intentions and the community's lived reality, where outcomes may not be sufficiently visible, participatory, or co-created with local stakeholders. Without stronger engagement and feedback mechanisms, these initiatives risk being seen as symbolic gestures rather than substantive actions. The findings imply that, to enhance impact, Initao College should adopt more participatory approaches that actively involve community members in planning, implementation, and evaluation of environmental programs. Co-creation strategies, such as joint environmental projects, community audits, and iterative feedback sessions, can increase both the relevance and sustainability of initiatives. Leal Filho et al. emphasize that stakeholder engagement and inclusive participation are essential for universities to deliver meaningful sustainability outcomes [26]. Similarly, Martin, Hill, Maples, Baker, and Butsch-Kovacic demonstrate that involving local residents in environmental health projects fosters trust, shared ownership, and sustained impact [27]. Therefore, bridging the perception gap requires more than well-designed programs; it necessitates processes that empower community members as active partners rather than passive beneficiaries. Strengthening co-development mechanisms not only enhances visibility and effectiveness but also cultivates a sense of mutual responsibility and accountability. By integrating these participatory practices, Initao College can transform its environmental initiatives from largely symbolic efforts into genuinely impactful, community-centered sustainability actions.

Notably, the results in Table 5 reveal a clear and concerning gap between students' and community members' perceptions of Initao College's environmental initiatives. While students rated the programs as effective, the community reported very low satisfaction and appreciation, indicating that the initiatives are not fully meeting local needs or creating meaningful impact. This discrepancy suggests that the college's environmental programs may be insufficiently aligned with community priorities, and that the community may perceive these efforts as symbolic rather than substantive. These findings imply that Initao College needs to strengthen engagement mechanisms to foster trust, legitimacy, and shared ownership. Actively involving community members in the planning, implementation, and evaluation of initiatives can ensure that programs are relevant, responsive, and co-created. Transparent feedback systems, participatory decision-making forums, and sustained, long-term partnerships can help the community feel recognized and valued, bridging the gap between institutional intentions and community experience. Evidence from recent studies reinforces this approach. Plummer et al. highlight that university–community partnerships are most effective when institutions employ shared decision-making, continuous feedback, and accountability mechanisms, allowing both the university and the community to assess and improve program performance [28]. Similarly, Biancardi et al. emphasize that sustainability initiatives must move beyond top-down delivery, integrating community participation and co-creation to build trust, relevance, and long-term impact [29]. By adopting these practices, Initao College can transform its environmental initiatives from symbolic gestures into meaningful, community-

centered programs that foster satisfaction, appreciation, and enduring goodwill.

Ultimately, the results in Table 6 reveal a pronounced gap between students' and community members' perceptions regarding the sustainability and continuity of Initao College's environmental initiatives. While students rated the programs as effective, the community rated them very low, indicating skepticism about whether these initiatives will promote long-term environmental practices, sustain positive change over time, or inspire future projects. This discrepancy suggests that the college's programs, although well-intentioned, may not be sufficiently embedded in the community or perceived as lasting and meaningful efforts. These findings imply that Initao College should focus on institutionalizing its sustainability initiatives to foster long-term impact. The college can strengthen partnerships with local stakeholders, establish structures for ongoing monitoring and evaluation, and create mechanisms that promote community co-ownership, such as participatory decision-making forums or community-led environmental hubs. Embedding sustainability practices into curricula, campus operations, and community engagement strategies will further enhance continuity and ensure that environmental practices are integrated into both institutional and community life. The importance of these strategies is supported by recent research. Mancini et al. emphasize that long-term sustainability in university–community partnerships is achieved when programs are embedded institutionally, co-created with stakeholders, and designed to generate lasting community ownership [30]. Similarly, Carmen et al. highlight that the quality of relationships between institutions and community actors—including trust, respect, and shared responsibility—is critical for ensuring the sustainability of environmental initiatives over time [31]. These studies suggest that fostering institutional commitment, participatory engagement, and strong relational networks is essential for Initao College to transform its environmental initiatives from short-term projects into enduring, community-centered programs that achieve meaningful and lasting impact.

In addition, the results in Table 7 show strong and statistically significant correlations between Initao College's environmental education initiatives and community perceptions of their effectiveness. Curriculum-based programs, community engagement activities, and institutional support and partnerships all exhibited high positive correlations with perceived environmental impact, community satisfaction and appreciation, and sustainability and continuity, with r values ranging from 0.726 to 0.877 ($p < .001$). These findings indicate that the scope and quality of program implementation are closely linked to how the community experiences and evaluates these initiatives. These findings suggest that environmental initiatives are most effective when they are integrated into institutional structures and actively co-created with the community. Programs embedded in the curriculum, supported by participatory activities, and reinforced through institutional backing are more likely to produce observable environmental outcomes, foster community satisfaction, and sustain long-term positive change. Facilitating collaboration, shared decision-making, and ongoing feedback can enhance community ownership and ensure initiatives are perceived as meaningful and impactful. Recent studies support

this view. Kusmulyono et al. found that embedding community development into higher education programs strengthens both social and environmental outcomes, while Rodríguez Zurita et al. Mero (2025) emphasize that service-learning and community engagement initiatives are more effective and enduring when they are participatory, experiential, and institutionally supported [32,33]. Together, these findings highlight that the success of environmental education initiatives depends not only on program content but also on institutional support and meaningful community involvement, reflecting the strong relationships observed in Table 7.

The results in Table 8 reveal a statistically significant difference between students' and community members' perceptions regarding the implementation effectiveness of Initao College's environmental education initiatives. Students perceived the initiatives as highly effective, whereas community members rated them very low. This significant difference highlights a clear gap in how the programs are experienced and evaluated by the two groups, suggesting that while students may be directly involved and recognize the benefits of the programs, the broader community does not perceive or experience these benefits to the same extent. These findings imply that environmental education initiatives must be designed and implemented in ways that are both meaningful and visible to the community. Programs should foster participatory planning, co-creation, and sustained engagement with local stakeholders to ensure that community members feel included, recognized, and able to witness tangible outcomes. Strengthening mechanisms for feedback, shared decision-making, and ongoing collaboration can enhance community ownership and trust, bridge the perception gap and ensuring that initiatives are perceived as substantive rather than symbolic. Recent research reinforces this perspective. Iluj' Dhia Hakiki and Saputra emphasize that well-designed environmental education programs in higher education enhance students' knowledge, awareness, and engagement with sustainability practices, illustrating the importance of strong institutional program design [34]. Tuazon similarly highlights the necessity of environmental governance through education, emphasizing community-institution partnerships, experiential learning, and participatory governance as essential for building a culture of sustainability and resilience [35]. Together, these studies support the conclusion that Initao College's initiatives need to be both robust in design and actively co-created with the community to achieve meaningful, long-lasting, and widely recognized impact.

Finally, the results in Table 9 indicate a statistically significant difference between students' and community members' evaluations of the effectiveness of Initao College's environmental education initiatives in terms of perceived impact, satisfaction, and sustainability. While students perceived the initiatives as highly effective, the community rated them very low. This significant gap highlights a disparity in how these programs are experienced and evaluated, suggesting that the broader community may not fully recognize, experience, or engage with the initiatives to the same extent as students who are directly involved. These findings imply that environmental education initiatives must go beyond classroom implementation to actively involve the community in planning, execution, and evaluation. Programs should foster participatory governance, co-creation, and continuous feedback mechanisms to ensure

that community members feel included, valued, and able to witness tangible outcomes. Strengthening these elements can enhance trust, improve perceived legitimacy, and sustain long-term engagement, ultimately bridging the perception gap between students and the community. Recent research supports this perspective. Nanyanzi, Zhu, and Kintu demonstrate that differences in stakeholder expectations and perceptions can reduce the effectiveness of university-community engagement programs, highlighting the need for participatory approaches [36]. Similarly, Amorim et al. show that multi-stakeholder collaboration and community involvement are critical to ensuring that sustainability initiatives in higher education are perceived as impactful and sustainable [37]. Together, these studies reinforce the conclusion that Initao College's environmental education initiatives must combine strong institutional design with inclusive community engagement to achieve meaningful impact, satisfaction, and sustainability for all stakeholders.

In conclusion, the findings of this study expose a profound and urgent disconnect between how students and the community perceive Initao College's environmental initiatives. While students view these programs as effective and transformative, the community—those who should benefit most—sees very little meaningful impact. This gap is not a simple misunderstanding; it is a signal that current efforts, though well-framed academically, are not translating into visible, lived improvements in the community's environment, sense of participation, or trust in the institution. In other words, the college is planting seeds, but the community does not see anything growing. This disconnect underscores a critical truth: environmental education cannot succeed within the walls of the classroom alone. Its success must be measured in cleaner surroundings, empowered citizens, stronger partnerships, and a shared sense of responsibility. Without community ownership, even the most well-designed initiatives risk becoming symbolic—visible on paper but invisible in practice. For Initao College to fulfill its mission, it must transform from an institution that teaches about the environment into an institution that co-builds a sustainable environment with its community. Only then will the college's programs evolve from isolated projects into a shared movement for environmental resilience and lasting social impact.

To address this disconnect, the following recommendations are proposed to strengthen the relevance, visibility, and community impact of Initao College's environmental initiatives. First, the college must prioritize authentic community engagement by actively involving local stakeholders in the planning, implementation, and evaluation of programs. This ensures that initiatives reflect community needs and build trust. Environmental programs should also produce visible and meaningful results—such as cleaner public spaces, expanded green areas, and improved waste management systems—to demonstrate genuine commitment and create a sense of shared achievement. Strengthening long-term partnerships with local government units, civic organizations, and environmental groups will help transform short-term projects into sustained, collaborative efforts. Integrating service-learning and community-based activities into the curriculum will allow students to apply their knowledge in real-world contexts, ensuring that academic lessons lead to practical community benefits. Additionally, the college should establish transparent communication channels,

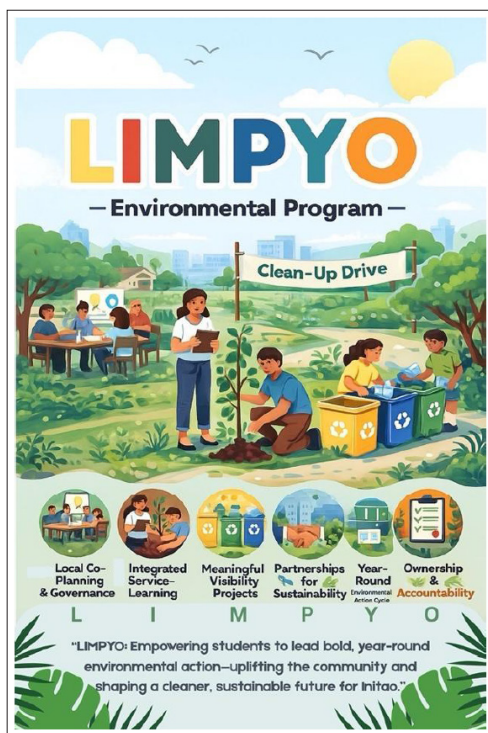
regular community consultations, and continuous feedback mechanisms to promote accountability and shared ownership.

Implementing these recommendations, Initao College can transform its environmental initiatives into genuinely impactful, community-centered programs that foster lasting sustainability, strengthen partnerships, and bridge the perception gap between students and the community.

Proposed Intervention Framework: Limpyo

Program overview

The LIMPYO Program—derived from the Cebuano word ‘limpyo,’ which means clean—is a comprehensive, community-centered environmental initiative designed to directly address the gaps identified between students’ and the community’s perceptions of Initao College’s environmental programs. Developed in response to the study’s findings, LIMPYO strengthens visibility, participation, sustainability, and community ownership of environmental actions. Through co-creation, long-term partnerships, service-learning, recycling initiatives, and sustained youth leadership, the program transforms environmental education from isolated academic activities into meaningful, community-driven stewardship.



Program Goal

To foster a sustainable, collaborative, and community-empowered environmental culture that ensures every initiative of Initao College is visible, meaningful, co-owned, and environmentally impactful.

Specific Objectives

- Strengthen community involvement through participatory planning and shared decision-making.
- Deliver visible, measurable, and long-lasting environmental improvements in partner communities.
- Integrate service-learning and experiential environmental action into the curriculum.

- Build long-term, mutually beneficial partnerships with local government units, organizations, and civic groups.
- Institutionalize a sustainability system that supports year-round environmental programs.
- Promote a culture of responsibility, recycling, and environmental awareness among students and community members.

TABLE: LIMPYO PROGRAM STRUCTURE

Program Component	Description	Purpose / Expected Impact
L – Local Co-Planning and Governance Hub	Creation of a LIMPYO Community Council composed of community representatives, student leaders, NSTP coordinators, faculty, and LGU environmental officers.	Ensures community members are involved in planning, monitoring, and evaluating programs; addresses lack of participation.
I – Integrated Service-Learning Projects	Embedding environmental tasks into course requirements and NSTP activities (clean-ups, environmental mapping, community education).	Connects academic learning with real-world impact, ensuring student efforts create visible benefits in the community.
M – Meaningful Environmental Visibility Projects	Implementation of community gardens, recycling stations, segregation hubs, tree-planting with monitoring, eco-murals, and “Limpyo sa Barangay” monthly drives.	Produces tangible, visible improvements that increase community satisfaction and trust.
P – Partnerships for Sustainability	Establishing formal agreements with LGUs, DENR, NGOs, schools, and civic groups to support environmental initiatives.	Strengthens long-term collaboration and resource sharing; moves initiatives beyond symbolic actions.
Y – Year-Round Environmental Action Cycle	Monthly environmental activities, quarterly reports, bi-annual assessments, and annual sustainability summits.	Ensures continuity of efforts and prevents one-time, short-lived environmental actions.
O – Ownership and Accountability Framework	Includes community scorecards, transparency reports, public updates, and recognition for active barangays and student groups.	Builds trust, shared responsibility, and stronger community–institution relationships.

Oplan LIMPYO Plastiko – Circular Recycling & Tree Sustainability Fund	Students collect plastic bottles; plastics are sold to recycling centers; proceeds go to a fund supporting tree maintenance until student graduation.	Ensures trees planted by students survive long-term; instills recycling culture and environmental responsibility.
NSTP-led Sustainability Seminar Series	NSTP students conduct community seminars on sustainability, waste segregation, recycling, and climate awareness.	Empowers students as environmental ambassadors; inspires community members to adopt sustainable practices.
Clean Home, Clean Initao: Plastic-for-Points Incentive System	Households collect plastic bottles and exchange them for Eco-Points redeemable for seedlings, reusable bags, compost soil, or school supplies.	Encourages continuous cleanliness at home and in public spaces; ensures community-wide participation in waste reduction.

The enhanced LIMPYO Program directly responds to the significant perception gaps revealed in the study. Designed as a student-facilitated initiative and carried out with the guidance and technical support of the Research, Development, and Extension Services (RDES), the program integrates community participation, recycling initiatives, sustained tree stewardship, service-learning components, year-round action, and NSTP-led community education. Through this structure, LIMPYO transforms environmental initiatives into a movement of shared responsibility, continuous engagement, and visible environmental change.

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