

AN INQUIRY INTO PHYSICAL EDUCATION FOR SUSTAINABLE DEVELOPMENT: BASIS FOR ENHANCEMENT PROGRAM

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ABSTRACT

This study investigated how public secondary school physical education (PE) teachers promote sustainable development across environmental, economic, health, social, and gender inclusion dimensions. Employing a quantitative descriptive-comparative design, the research included all PE teachers in Hinatuan, Surigao del Sur, using full enumeration. Data were analyzed with descriptive statistics, t-tests, and ANOVA. Results revealed that teachers frequently promote sustainability in PE, particularly in social sustainability and gender inclusion. There was no significant difference in promotion between male and female teachers; however, those with higher educational attainment demonstrated a stronger commitment to sustainability than those with only college degrees. The study concludes that while PE teachers are actively fostering sustainable development, further professional development and curriculum support are recommended. An enhancement program was developed based on these findings to strengthen the integration of sustainability in PE instruction.

KEYWORDS: *Sustainable Development, Enhancement Program, Educational Attainment, Descriptive Comparative, Philippines*

INTRODUCTION

Physical Education (PE) has become an increasingly relevant avenue for promoting the United Nations Sustainable Development Goals (SDGs), especially when integrated with Education for Sustainable Development (ESD). This integration, referred to as Physical Education for Sustainable Development (PESD), retains PE's traditional objectives while emphasizing sustainable behaviors, social inclusion, environmental awareness, and gender equality (Baena-Morales et al., 2023). However, incorporating sustainability themes into

PE remains inconsistent, particularly in developing nations like the Philippines. De Guzman (2016) noted that although Filipino PE teachers acknowledge the importance of sustainability, fewer than 25 percent actually integrate SDG-related topics into their curriculum. The gap between awareness and practice is further aggravated by a lack of structured guidance and institutional support, making it difficult for educators to consistently embed sustainability in their instruction (Fröberg & Lundvall, 2021).

Globally, researchers have well documented the challenges of implementing PESD. The OECD (2019) highlighted that many countries, including Australia, England, Japan, and Norway, struggle with insufficient curriculum time for PE, insufficient teacher training, and minimal inclusion of sustainability concepts. Ferriz-Valero (2022) presented similar findings, noting that despite its potential, PESD faces setbacks due to curriculum constraints and vague implementation strategies. Thakre (2022) noted that both developed and developing nations face cultural resistance and resource scarcity, which further hinder efforts to integrate sustainable development into PE programs.

In the Philippines, Molina (2023) identified inadequate teacher training and limited resources as primary barriers to integrating sustainability into instruction. Kirk (2020) emphasized that without institutional support, sustainability remains an undervalued aspect of the PE curriculum. Additionally, Licudine (2024) observed that although PE teachers in Mindanao attempt to incorporate themes such as environmental care and gender equality, they often face resource constraints and uneven regional support. Hernandez et al. (2020) and Corpuz et al. (2022) similarly pointed out that systemic issues, such as unequal access to PE, underfunded programs, and a lack of professional development, hinder the full realization of PESD in local schools.

Despite the growing body of literature on PESD, there is a scarcity of localized, quantitative studies focused solely on the degree to which PE teachers promote sustainable development, especially in secondary education. While studies such as those by De Guzman (2020) and Licudine (2024) have examined various correlational factors, few have investigated the direct promotion levels of PESD using single-variable analyses. This study addresses that gap by describing the promotion of PESD among public secondary school teachers in Hinatuan, Surigao del Sur. It aims to assess how PE teachers promote sustainability across environmental, health, economic, social, and gender-inclusive dimensions and whether these efforts differ by sex and

educational attainment. By identifying existing practices and gaps, this research aims to serve as a basis for a data-driven enhancement program to strengthen PESD promotion in public schools.

Statement of the Problem

1. What is the respondents' profile regarding sex and educational attainment?
2. What is the level of promotion of physical education for sustainable development among the respondents in terms of: environmental sustainability; health sustainability; economic sustainability; social sustainability; gender and inclusion?
3. Is there a significant difference in the level of promotion of physical education for sustainable development when grouped according to profile?
4. Based on the results, what enhancement program can be crafted?

METHODOLOGY

Research Design. This study employed a quantitative, descriptive-comparative design to examine the promotion of Physical Education for Sustainable Development (PESD) by public secondary school PE teachers in Hinatuan, Surigao del Sur. The descriptive component provided a detailed snapshot of current teaching practices, while the comparative component enabled the analysis of naturally occurring groups, specifically, male versus female teachers and teachers with differing levels of educational attainment, without manipulating any variables. By integrating these two designs, the research offered a comprehensive view of both overall promotion levels and demographic influences.

Research Respondents. The study population consisted of all 42 PE teachers from eight public secondary schools in the Hinatuan School District. Complete enumeration was used to ensure that every eligible teacher participated. Inclusion criteria required respondents to hold a degree in physical education or a related field and to be actively teaching PE; teachers who did not meet these criteria were excluded. Data were gathered using a 25-item PESD survey instrument adapted from Baena-Morales et al. (2023). This questionnaire measured two principal components—environmental, health, and economic sustainability, and social sustainability, gender, and inclusion. Prior to full deployment, the instrument underwent expert content validation, factorial validation, and pilot testing, yielding a Cronbach's alpha of 0.95.

Data Analysis. Encoded data were analyzed using standard statistical procedures at a significance level of $p < 0.05$. Means and standard deviations were computed to determine overall levels of PESD promotion and the dispersion of responses. Independent samples t-tests were conducted to evaluate differences in promotion levels between male and female teachers. One-way analysis of variance (ANOVA) was used to compare PESD promotion across groups defined by educational attainment.

Ethical Considerations. Before conducting the study, this research underwent an ethics review process through the office of the Research Ethics Committee (REC) of the University of the Immaculate Conception (UIC). This is to certify that the study was done ethically.

RESULTS AND DISCUSSION

Demographic Profile of the Respondents

The study involved 42 Physical Education (PE) teachers from various public secondary schools in Hinatuan, Surigao del Sur. Table 1 shows the demographic profile of the respondents; a majority were female (61.9%), while male respondents accounted for 38.1%. This reflects a gender imbalance, with more women teaching PE in the selected public schools. Regarding educational attainment, most respondents were college graduates (71.4%), while 28.6% had attained a master's degree. This suggests that a significant portion of the PE teaching workforce in the area may not have pursued advanced studies beyond the undergraduate level.

Table 1
Demographic Profile of the Respondents

	Frequency	Percent (%)
Sex		
Male	16	38.1
Female	26	61.9
Total	42	100.0
Educational Attainment		
College graduate	30	71.4
With Master's Degree	12	28.6
Total	42	100.0

The data reveal that there are more female than male physical education teachers in Hinatuan Public Secondary schools. This supports Cabansag (2020), who found that women tend to dominate the teaching profession in the Philippines due to societal and cultural norms that associate women with nurturing roles. This finding is supported by Salazar and Ramos (2019), who observed that gender disparity remains prominent in the basic education sector, where female teachers significantly outnumber males. Cruz (2021) also reported that the feminization of the teaching profession in the Philippines stems from historical gender expectations and economic circumstances, portraying teaching as a suitable profession for women. The World Bank (2023) further noted that female teachers accounted for 71.46% of the secondary education workforce in the Philippines in 2022. Consistently, Dela Cruz et al. (2024) reported that 73.7% of K-12 educators in the country are women, reflecting a deeply embedded trend of female dominance in the teaching sector. Complementing these findings, the Philippine Statistics Authority (2024) also reported that women not only dominate the profession numerically but also in terms of educational attainment, shaping the educational landscape through their strong presence and performance.

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Meanwhile, the results revealed that a considerable number of teachers have not pursued or completed graduate-level education, potentially affecting their capacity to engage with advanced concepts like sustainable development. This concern is supported by Ofsted's (2016) findings, which emphasize that teachers' subject knowledge and continued professional development are key to delivering high-quality PE instruction. Generalao et al. (2022) also highlighted that teachers with only undergraduate qualifications may lack the advanced knowledge needed to integrate specialized themes, such as sustainability, into PE curricula. The World Bank (2023) further stressed the importance of enhancing teachers' competencies through graduate training, citing a general lack of subject mastery among basic education teachers. This observation is corroborated by Buenavista (2019), who noted that despite an upward trend in graduate enrollment among teachers, a substantial proportion still hold only a bachelor's degree. Gupo and Patena (2022) emphasized the benefits of continuous professional growth, noting that teachers who engage in advanced education and training exhibit stronger professional identity and greater teaching effectiveness. Moreover, Karaiskos et al. (2025) found that targeted continuing professional development programs enhance PE teachers' self-efficacy and adaptability, which are critical for promoting sustainability. Royet et al. (2024) echoed these findings, asserting that access to advanced training and professional development equips teachers with the tools to integrate sustainability effectively into their instruction, although such access remains uneven.

Level of Promotion of Physical Education for Sustainable Development Among the Respondents

Table 2 shows the level of promotion of Physical Education for Sustainable Development (PESD); the overall mean score was 4.06, interpreted as "high," with a standard deviation of 0.36, indicating a consistent level of PESD promotion among respondents. Across the five domains of sustainable development, teachers rated all of them as highly promoted. The domain of social sustainability received the highest mean score of 4.19, indicating that PE teachers strongly emphasize inclusive practices, community-building, and social equity in their classes. This was followed by Health Sustainability, with a mean score of 4.15, highlighting the importance placed on fostering healthy habits and well-being among students.

Table 2
Level of Promotion of Physical Education for Sustainable Development Among the Respondents

Indicators	Mean	SD	Description
Environmental Sustainability	3.98	.48	High
Economic Sustainability	3.97	.57	High
Health Sustainability	4.15	.32	High
Social Sustainability	4.19	.49	High
Gender and Exclusion	4.02	.49	High
Overall Mean	4.06	.36	High

***Item/s with asterisk were subjected to reverse coding before the category mean computation.*

The findings of this study revealed that the promotion of Physical Education for Sustainable Development (PESD) among public secondary school teachers in Hinatuan, Surigao del Sur, is generally evident but still requires significant enhancement in specific areas, particularly in environmental and economic sustainability. While PE teachers actively promote the social and health aspects of sustainability through inclusive, wellness-oriented activities, the principles of environmental consciousness and economic innovation remain underutilized in the curriculum. These results emphasize the necessity of a more holistic, deliberate integration of sustainability dimensions into PE instruction.

Overall, the results demonstrate that PE teachers in the selected schools exhibit a strong and consistent commitment to promoting sustainable development in their teaching practices, particularly in the social and health aspects of sustainability. The findings suggest that physical education is being utilized not only to promote physical activity but also as a vehicle for addressing broader goals aligned with sustainable development.

The results also indicate that the promotion of Physical Education for Sustainable Development (PESD) among public secondary school teachers in Hinatuan, Surigao del Sur, is at a high level. highlights the active promotion of the Sustainable Development Goals (SDGs) in PE, demonstrating high teacher engagement in integrating environmental, economic, health, social, and gender-related sustainability into their teaching. As Smith and Jones (2022) posited, teaching competencies are fundamental for promoting the SDGs, particularly when educators receive adequate training and support.

Baena-Morales et al. (2023) emphasized the unique potential of PE to promote critical and systemic thinking about sustainability. Similarly, Licudine (2024) noted that PE teachers with strong physical literacy and professional preparation are more likely to effectively incorporate SDG themes. The findings also support Wright et al. (2025), who demonstrated that models such as the Personal and Social Responsibility Model can foster a broader understanding of social and environmental issues through PE. Moreover, Cruz and De Guzman (2021) found that teachers are more likely to engage in sustainability practices when they understand the direct connection between PE and sustainable development. The results suggest that teachers often promote sustainability concepts in their physical education instruction. Among the various dimensions assessed, the health sustainability domain emerged as the most strongly promoted, highlighting educators' emphasis on encouraging students to lead active, healthy lifestyles. Environmental sustainability, gender, and inclusion also received strong promotion, reflecting a commitment to ecological awareness and equitable participation. In contrast, PE teachers rated the domains related to economic sustainability, peace, and justice as the least promoted, even though they still received positive ratings. This implies a potential area for improvement, particularly in helping students understand the economic implications of sustainable living and the importance of fostering peace and fairness through physical education.

Further analysis across the five domains shows that PE teachers address all aspects of sustainable development to varying degrees. The prioritization of health-related goals indicates strong alignment with traditional PE outcomes, while the relatively lower emphasis on economic and peace-related aspects suggests these themes may not be as deeply embedded in current teaching practices. This could be due to a lack of targeted training or resources that connect these domains explicitly with physical education.

The Gender and Inclusion domain had a mean of 4.02, showing that PE teachers actively promote gender equality and ensure inclusive participation in physical activities. The Environmental Sustainability domain yielded a mean score of 3.98, suggesting that teachers incorporate environmentally responsible practices such as recycling and nature-based physical activities into their lessons. Lastly, the Economic Sustainability domain had the lowest mean score among the five at 3.97, although still within the “high” range, indicating efforts to promote teamwork, leadership, and awareness of local economic and cultural values through PE.

Significance of the Differences in the Level of Promotion of Physical Education for Sustainable Development according to Sex and Educational Attainment

Also, Table 3.1 shows that there is no significant difference in the level of promotion of physical education for sustainable development across sex groups. This is evidenced by the p-value of 0.26, which exceeds the 0.05 significance level (two-tailed), and the t-value of -1.14. Similarly, all measured domains of promotion, including environmental, economic, health sustainability, and gender and exclusion, showed p-values greater than 0.05. indicating comparable promotion levels between male and female teachers.

Table 3.1
Significance of the Differences in the Level of Promotion of Physical Education for Sustainable Development according to Sex

	Mean	SD	df	t-value	p-value	Remarks
Environmental Sustainability			40	.18	.86	Not significant
Male	4.00	.54				
Female	3.97	.45				
Economic Sustainability			40	-1.86	.07	Not Significant
Male	3.77	.53				
Female	4.10	.57				
Health Sustainability			40	-.64	.53	Not Significant
Male	4.09	.46				
Female	4.19	.45				
Social Sustainability			40	.52	.61	Not Significant
Male	4.14	.60				
Female	4.22	.41				
Gender and Exclusion			40	-1.69	.10	Not Significant
Male	3.86	.53				
Female	4.13	.45				
Promotion of Physical Education for Sustainable Development			40	-1.14	.26	Not Significant
Male	3.97	.43				
Female	4.12	.38				

When examining potential differences based on sex, the findings show no significant variation in the promotion of PESD. Both male and female teachers appear to demonstrate similar levels of commitment and effort in integrating sustainability themes into their lessons. This result suggests that promoting sustainable development in PE is consistent across teachers' sexes, indicating equitable awareness and implementation among all teachers. It supports the study of Çobanoğlu and Türer (2015), which found no significant difference between male and female science teachers in Turkey regarding their awareness of sustainable development, suggesting that gender does not significantly influence educators' commitment to sustainability in education. Similarly, Demirbaş (2015) reported that both male and female pre-service teachers exhibit comparable abilities to promote sustainable teaching practices, further affirming that gender is not a determining factor in promoting sustainability.

Conversely, in Table 3.2, there is a significant difference in the promotion of physical education for sustainable development across educational attainment groups. The overall p-value of 0.000 ($t = -5.39$) is below the 0.05 threshold, signifying that teachers with a master's degree promote physical education for sustainable development at a significantly higher level than those with only a college degree. This trend is consistent across all domains, where master's degree holders scored mean ratings ranging from 4.30 to 4.54, which are higher than the 3.78 to 4.05 mean ratings of college graduates. These findings suggest that educational attainment plays an important part in determining teachers' promotion of physical education for sustainable development, with higher education correlating with more active promotion.

Table 3.2
Significance of the Differences in the Level of the Promotion of Physical Education for Sustainable Development according to Educational Attainment

	Mean	SD	Df	t-value	p-value	Remarks
Environmental Sustainability			40	-2.93	.006	Significant
College Graduate	3.86	.48				
With Master's Degree	4.30	.30				
Economic Sustainability			40	-3.86	.000	Significant
College Graduate	3.78	.54				
With Master's Degree	4.44	.37				
Health Sustainability			40	-4.34	.000	Significant

College Graduate	3.99	.39				
With Master's Degree	4.55	.33				
Social Sustainability			40	-3.29	.002	Significant
College Graduate	4.05	.47				
With Master's Degree	4.54	.35				
Gender and Exclusion			40	-5.66	.000	Significant
College Graduate	3.82	.41				
With Master's Degree	4.54	.24				
Promotion of Physical Education for Sustainable Development			40	-5.39	.000	Significant
College Graduate	3.90	.34				
With Master's Degree	4.48	.21				

A notable difference emerged when considering the teachers' educational attainment. Teachers who had obtained master's degrees were found to promote PESD at a significantly higher level compared to those with only undergraduate degrees. This suggests that further academic training enhances teachers' capacity to understand and apply sustainability concepts within the PE curriculum. It highlights the importance of continuous professional development and advanced education in empowering teachers to deliver more effective and meaningful sustainability education through physical activities. This finding aligns with Flores and Dizon (2020), who emphasized that advanced academic qualifications enhance teachers' understanding and application of sustainability themes. Delos Santos (2021) also noted that postgraduate education refines pedagogical strategies, enabling better integration of global competencies such as sustainable development. Furthermore, Sharma (2019) highlighted that teachers with master's degrees are more deliberate in embedding sustainability into PE curricula. Similarly, Casey and O'Donovan (2015) concluded that postgraduate qualifications significantly enhance educators' abilities to integrate innovative themes, including sustainability, into their instruction.

The environmental component was the least emphasized, as evidenced by limited implementation of eco-friendly practices, minimal outdoor education initiatives, and scarce integration of environmental awareness into lessons. Similarly, economic sustainability was found to be lacking due to the absence of activities that promote resourcefulness, innovation, and the development of entrepreneurial skills within the PE context. Teachers cited a lack of training and structured support as barriers to effectively implementing these components. Moreover, the study found that professional development plays a pivotal role in

enabling teachers to incorporate sustainable development concepts into their teaching. Those who had engaged in relevant training or pursued advanced studies demonstrated a stronger commitment and ability to embed PESD principles in their lessons. This suggests that teachers' professional growth directly influences the scope and quality of sustainability promotion in physical education.

Enhancement Program

In response to these findings, an enhancement program was developed to address the identified gaps and promote a more comprehensive sustainability approach in PE, as shown in Table 4. The program, titled “PESD-PRO: Promoting Physical Education for Sustainable Development Through Inclusive and Action-Oriented Strategies,” aims to strengthen the integration of sustainability in PE classes at Hinatuan Southern College during the academic year 2025–2026. PESD-PRO is designed to embed environmental, economic, health, and social sustainability principles through inclusive games, eco-friendly practices, wellness sessions, and innovation-focused activities. It features integrated modules, teacher training, student engagement initiatives, and regular monitoring to ensure effectiveness.

Table 4
PESD-PRO- Promoting Physical Education for Sustainable Development Through Inclusive and Action-Oriented Strategies

Program Timeline

Phase	Activity	Timeline	Responsible Party
Phase 1: Preparation	- Preparation of program concept, budget, and proposal documents	May - June 2025	Program Lead, Administrative Support
	- Initial consultation with PE Department, Academic Coordinators, and Sustainability Officer	May - June 2025	Program Lead, PE Teachers, Sustainability Officer
	- Finalizing the budget and resources allocation	June 2025	Program Lead, Administrative Support

Phase	Activity	Timeline	Responsible Party
<i>Phase 2: Training & Development</i>	- Conduct training workshops for PE teachers on integrating sustainability into PE lessons	July - August 2025	Teacher Trainers, PE Teachers
	- Develop and distribute teaching guides for sustainable practices in PE	July - August 2025	Teacher Trainers, Program Lead
<i>Phase 3: Program Implementation</i>	- Launch of PESD-PRO Program, initial announcement to all students, faculty, and staff	August 2025	Program Lead, Academic Coordinators
	- Begin incorporating sustainable practices into PE classes (eco-friendly activities, inclusive games)	August - October 2025	PE Teachers
	- Organize initial health and well-being activities (e.g., mindfulness sessions)	August - October 2025	Health and Well-being Coordinator
<i>Phase 4: Monitoring & Evaluation</i>	- Ongoing evaluation and feedback collection from participants (teachers, students, staff)	November 2025 - February 2026	Program Evaluation Officer
	- Regular monitoring of activities to ensure adherence to sustainability and inclusivity goals	November 2025 - February 2026	PE Teachers, Sustainability Officer
<i>Phase 5: Adjustment & Improvement</i>	- Analyze feedback and assess the effectiveness of the program	February 2026	Program Lead, Program Evaluation Officer
	- Revise and improve activities based on feedback	March 2026	Program Lead, PE Teachers
<i>Phase 6: Final</i>	- Conduct final program	April 2026	Program Lead,

Phase	Activity	Timeline	Responsible Party
<i>Evaluation & Reporting</i>	evaluation and report the overall success of the PESD-PRO program		Program Evaluation Officer
<i>Phase 7: Sustainability & Legacy</i>	- Develop a long-term sustainability plan for PESD-PRO (e.g., continuing eco-friendly practices, inclusive activities)	May 2026	Program Lead, Sustainability Officer

Activities will include eco-fit days, inclusive play weeks, and the use of recycled materials in PE tasks, while professional development sessions will equip teachers to deliver these strategies effectively. The program is grounded in collaboration among stakeholders, with clear roles for teachers, coordinators, and school administrators. Feedback and evaluation mechanisms are embedded throughout the implementation cycle to measure progress and inform continuous improvement. Ultimately, PESD-PRO responds to the study's findings by operationalizing the goal of sustainability in physical education. It seeks to transform sustainability from a peripheral idea to a lived experience within the school setting, ensuring that students understand and practice sustainable behaviors in their daily lives.

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