

Eco-Literacy and Life Sciences Integration in English Language Curricula: Lived Experiences of Selected Basic Education and Junior High School Teachers

Annalyn J. Decena, PhD

Marinduque State University

mogie.decena@yahoo.com

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Abstract

The increasing urgency of environmental degradation, biodiversity loss, and climate change has intensified the call for integrating sustainability concepts across educational disciplines. While eco-literacy has traditionally been associated with science education, English Language curriculum offers significant opportunities to cultivate environmental awareness through literary analysis, critical discourse, reflective writing, and contextual communication. Language educators are uniquely positioned to facilitate interdisciplinary learning by embedding life sciences concepts into language instruction, thereby fostering ecological consciousness alongside communicative competence. Despite the growing emphasis on Education for Sustainable Development (ESD), little is known about how language teachers experience the integration of eco-literacy and life sciences into English language contexts. This study explores the lived experiences of selected Basic Education and Junior High School language teachers in Marinduque and Quezon. It investigates how they integrate life sciences into their instructional practices to advance eco-literacy. Employing a qualitative phenomenological design using Interpretative Phenomenological Analysis (IPA), the study purposively selected language teachers actively engaged in teaching English-related subjects. Data were gathered through semi-structured in-depth interviews and analyzed following the systematic procedures of IPA. The study is expected to reveal the pedagogical strategies, enabling factors, instructional challenges, and professional insights that shape interdisciplinary teaching for environmental sustainability. The findings may contribute to strengthening curriculum innovation, interdisciplinary pedagogy, teacher professional development, and sustainable education policies aligned with the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 13 (Climate Action), and SDG 15 (Life on Land).

Introduction

Environmental sustainability has become one of the defining educational priorities of the twenty-first century. Climate change, environmental degradation, biodiversity loss, deforestation, pollution, and declining ecological resilience continue to threaten both human well-being and global development. These environmental challenges have highlighted the necessity of cultivating environmentally responsible citizens through education. Consequently, educational institutions are increasingly expected to integrate sustainability principles

into teaching and learning across disciplines rather than confining environmental education solely to science subjects.

The concept of eco-literacy has emerged as an essential educational outcome that equips learners with the knowledge, values, skills, and attitudes necessary to understand ecological systems and make environmentally responsible decisions. Eco-literate individuals recognize the interconnectedness between humans and nature, appreciate biodiversity, and actively

participate in promoting environmental sustainability. UNESCO (2023) emphasizes that Education for Sustainable Development (ESD) enables learners to acquire competencies that empower them to address complex environmental issues through critical thinking, systems thinking, collaboration, and responsible action. These competencies extend beyond scientific understanding and require interdisciplinary educational approaches that integrate sustainability across all areas of learning.

Although environmental education has traditionally been associated with science instruction, English Language curricula provide equally meaningful opportunities for fostering eco-literacy. Language classrooms encourage learners to read, analyze, interpret, discuss, and produce texts that address contemporary environmental concerns. Literary works, informational texts, persuasive essays, speeches, debates, and reflective writing activities provide authentic contexts through which environmental concepts can be explored while simultaneously strengthening language proficiency. Through critical discourse, students examine ecological issues, evaluate multiple perspectives, develop environmental ethics, and communicate solutions to sustainability challenges.

Integrating life sciences into English language instruction represents an interdisciplinary pedagogical approach that enriches both environmental understanding and language learning. Topics such as ecosystems, biodiversity, conservation, climate change, sustainable agriculture, environmental health, and ecological

stewardship can serve as authentic language content that develops reading comprehension, vocabulary acquisition, oral communication, critical analysis, and academic writing. Such interdisciplinary integration aligns with constructivist learning principles by connecting language instruction to meaningful real-world issues that are socially relevant and intellectually engaging.

Teacher education institutions and professional development programs play a crucial role in preparing educators capable of implementing interdisciplinary and sustainability-oriented instruction. English language teachers serve not only as language educators but also as facilitators of critical thinking, ethical reflection, and social responsibility. Their experiences in integrating life sciences into English language class provide valuable insights into the practical realities of implementing Education for Sustainable Development within diverse educational contexts. Understanding these experiences contributes to improving curriculum design, instructional innovation, and teacher preparation for sustainability education.

Within the Philippine educational context, the Department of Education has increasingly emphasized environmental education through curriculum reforms and policies promoting climate change awareness, disaster risk reduction, biodiversity conservation, and sustainable development. Nevertheless, the integration of environmental concepts across non-science disciplines remains uneven. While English teachers recognize the educational value of contextualizing language instruction through

environmental issues, they often encounter challenges related to curriculum alignment, instructional resources, interdisciplinary competence, and professional preparation. These realities underscore the need for empirical studies that examine how language educators navigate interdisciplinary teaching in actual classroom practice.

Most existing research on eco-literacy focuses primarily on learners' environmental knowledge, science-based interventions, or quantitative assessments of environmental attitudes. Comparatively fewer studies have explored the lived experiences of English language educators who intentionally integrate life sciences into language instruction. Furthermore, limited qualitative research has examined this phenomenon within the Philippine educational setting, particularly among language teachers in the Schools Division of Quezon. Investigating these lived experiences offers valuable insights into how interdisciplinary teaching contributes to sustainability education while enhancing language learning.

Using Interpretative Phenomenological Analysis (IPA), this study seeks to understand how English language teachers interpret their experiences in integrating life sciences into English Language curriculum to promote eco-literacy. By foregrounding the voices of educators, the study contributes to the growing scholarship on interdisciplinary education, environmental literacy, curriculum innovation, and teacher professional development. Ultimately, the findings are expected to inform educational policies and pedagogical practices that

strengthen the role of language education in achieving sustainable development.

Research Gap

Although numerous studies have investigated environmental education, eco-literacy, and Education for Sustainable Development, the majority have focused on science education, environmental science curricula, or students' environmental attitudes using quantitative approaches. Comparatively little attention has been given to the role of English Language curricula as a vehicle for promoting eco-literacy through interdisciplinary instruction. Existing literature also provides limited understanding of how language teachers experience the integration of life sciences into English language teaching. Furthermore, qualitative phenomenological studies examining the lived experiences of language educators in the Philippine context remain scarce, especially within the research context. This gap limits understanding of the pedagogical practices, challenges, enabling conditions, and professional meanings associated with interdisciplinary sustainability education. Addressing this gap will provide context-specific evidence that can inform curriculum enhancement, teacher training, and policy initiatives supporting interdisciplinary approaches to eco-literacy and Education for Sustainable Development.

Purpose of the Study

This study aims to explore the lived experiences of the selected English language teachers in integrating life sciences into English Language curricula to advance eco-literacy.

Specifically, it sought to:

1. Describe the lived experiences of language teachers in integrating life sciences into English language instruction.
2. Explore the pedagogical strategies employed to promote eco-literacy through English Language Education.
3. Identify the opportunities and challenges encountered during interdisciplinary instruction.
4. Examine the factors that facilitate or hinder the integration of life sciences into language education.
5. Understand the meanings that language faculty attribute to interdisciplinary teaching for environmental sustainability.
6. Offer recommendations for strengthening eco-literacy through English Language curriculum in teacher education and professional development.

Review of Related Literature

Eco-literacy has become an increasingly important educational priority as societies confront complex environmental challenges such as climate change, biodiversity loss, pollution, and ecosystem degradation. The concept extends beyond understanding ecological principles; it encompasses the development of environmental values, systems thinking, critical reflection, and responsible action that enable individuals to contribute to sustainable development. According to UNESCO (2023), Education

for Sustainable Development (ESD) empowers learners with the knowledge, competencies, attitudes, and values needed to address environmental, economic, and social issues through informed decision-making and collective action. Eco-literacy therefore serves as a foundational competency that prepares learners to become environmentally responsible citizens capable of promoting sustainability in their personal and professional lives. As global education systems increasingly align curricula with the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 13 (Climate Action), and SDG 15 (Life on Land), interdisciplinary approaches to environmental education have become essential in fostering holistic learner development.

Scholars have emphasized that language classrooms are uniquely positioned to develop ecological awareness because language serves as the primary medium through which environmental knowledge is communicated, interpreted, negotiated, and transformed into meaningful social action (Stibbe, 2021). Consequently, integrating environmental themes into English language instruction enables students to acquire both linguistic competence and ecological responsibility through authentic and contextualized learning experiences.

The integration of life sciences into English Language curricula represents an interdisciplinary approach that enriches both language acquisition and sustainability education. Life sciences encompass biological systems, biodiversity, ecosystems, conservation, environmental health,

agriculture, and human interactions with natural environments. Embedding these concepts within language instruction enables students to explore authentic scientific issues through reading, writing, speaking, and critical discourse while developing academic literacy and ecological understanding simultaneously. Research has demonstrated that interdisciplinary instruction enhances knowledge transfer, improves student engagement, promotes higher-order thinking, and strengthens learners' ability to apply concepts across disciplines (Drake & Reid, 2020). By using environmental texts, scientific articles, documentaries, literary works, and community-based sustainability projects, English teachers create opportunities for learners to examine real-world environmental problems while improving language proficiency. Such integration aligns with constructivist learning principles that encourage learners to build knowledge through meaningful experiences and interdisciplinary connections.

Teacher education plays a pivotal role in advancing eco-literacy because educators serve as facilitators of transformative learning experiences that influence students' environmental values and behaviors. Language teachers, in particular, contribute to sustainable education by selecting environmentally relevant instructional materials, designing interdisciplinary learning activities, encouraging reflective dialogue, and promoting critical literacy regarding environmental issues. Effective integration of life sciences into English Language curriculum requires teachers to possess not only pedagogical competence but also interdisciplinary knowledge, curriculum

flexibility, and confidence in addressing sustainability concepts beyond their traditional disciplinary boundaries. However, several studies indicate that teachers often encounter challenges such as insufficient professional preparation, limited interdisciplinary collaboration, inadequate instructional resources, time constraints, and curriculum overload when implementing sustainability-oriented instruction (Evans et al., 2022). These barriers highlight the importance of continuous professional development, collaborative curriculum planning, and institutional support in strengthening interdisciplinary teaching practices.

Within the Philippine educational context, environmental education has gained increasing attention through curriculum reforms and national policies promoting climate change adaptation, disaster risk reduction, biodiversity conservation, and sustainable development. The Department of Education encourages the integration of environmental concepts across learning areas through contextualized instruction and learner-centered pedagogies. Nevertheless, implementation remains uneven, particularly within non-science disciplines where teachers often receive limited training in interdisciplinary environmental education. English language educators may recognize the value of incorporating environmental themes into reading selections, writing activities, oral communication tasks, and literary analyses; however, they frequently face challenges related to instructional materials, assessment practices, curriculum alignment, and interdisciplinary competence. These realities suggest that successful eco-

literacy integration depends not only on curriculum mandates but also on teachers' professional experiences, pedagogical beliefs, institutional support, and collaborative practices within educational communities.

Despite the expanding body of literature on eco-literacy and ESD, significant research gaps remain. Existing studies predominantly examine environmental knowledge, ecological attitudes, or sustainability competencies among students using quantitative methodologies. Comparatively fewer investigations explore the lived experiences of educators responsible for implementing interdisciplinary sustainability education, particularly within English Language Education. Moreover, qualitative phenomenological studies examining how language teachers integrate life sciences into language instruction remain scarce, especially within the Philippine educational system. Understanding teachers' lived experiences is essential because educators' perceptions, instructional decisions, challenges, and professional reflections directly influence the effectiveness of interdisciplinary teaching. Exploring these experiences contributes valuable context-specific evidence that may inform curriculum enhancement, teacher professional development, interdisciplinary collaboration, and educational policies supporting eco-literacy through language education. Ultimately, this study seeks to address this gap by providing an in-depth understanding of how English language teachers experience the integration of life sciences in advancing eco-literacy, thereby contributing to the

broader discourse on sustainable education and interdisciplinary pedagogy.

Theoretical Framework

This study is anchored on Ecopedagogy Theory proposed by Paulo Freire (1970) and further developed by Richard Kahn (2010), which views education as a transformative process that develops ecological consciousness, critical reflection, and social responsibility toward environmental sustainability. Ecopedagogy emphasizes that learners should critically examine the interconnected relationships among humans, society, and nature while becoming active participants in addressing environmental challenges. The theory supports integrating environmental concepts across disciplines, including English Language Education, where critical reading, reflective writing, dialogue, and discourse can cultivate eco-literacy and environmental stewardship.

The study is likewise grounded in Vygotsky's Social Constructivist Theory (1978), which explains that learning occurs through social interaction, collaboration, and meaningful engagement with authentic contexts. Integrating life sciences into English Language Education provides learners with opportunities to construct knowledge through discussions, literary analysis, collaborative inquiry, and problem-solving activities centered on environmental issues. Such interdisciplinary learning experiences promote deeper conceptual understanding while strengthening both language competence and ecological awareness.

Methodologically, the study is guided by Interpretative Phenomenological Analysis

(IPA) developed by Smith, Flowers, and Larkin (2022). IPA seeks to understand how individuals interpret and assign meaning to significant lived experiences. In this study, IPA provides an appropriate framework for exploring how English language faculty experience the integration of life sciences into language instruction, the challenges and opportunities they encounter, and the meanings they attach to promoting eco-literacy through interdisciplinary teaching.

Methodology

Research Design

This study employed a qualitative research design utilizing Interpretative Phenomenological Analysis (IPA) to explore the lived experiences of English language teachers in integrating life sciences into English Language curricula to advance eco-literacy. Qualitative phenomenology is appropriate when the objective is to understand how individuals perceive, interpret, and make meaning of a particular phenomenon based on their personal and professional experiences. IPA specifically focuses on examining participants' subjective interpretations of their experiences while recognizing the researcher's role in making sense of these interpretations. The design enabled an in-depth exploration of the instructional practices, pedagogical beliefs, opportunities, challenges, and professional reflections of language teachers as they integrate life sciences into their English language teaching. Through this approach, the study sought to generate rich, contextualized descriptions that contribute to understanding interdisciplinary teaching for sustainable education.

Research Locale

The study was conducted in Marinduque and Quezon, Philippines. These divisions continuously implement contextualized teaching and learning programs that encourage interdisciplinary instructional approaches aligned with the Department of Education's commitment to Education for Sustainable Development. Both divisions comprise diverse public elementary and secondary schools where English language educators actively implement curriculum innovations that integrate real-world issues, including environmental sustainability, into classroom instructions. The educational contexts of Marinduque and Quezon provide appropriate settings for examining how language teachers integrate life sciences into English Language curricula while responding to local environmental realities and community needs.

Participants of the Study

The participants consisted of 15 basic education and Junior High School teachers who handle English subjects in public schools in Marinduque and Quezon. Participants were chosen through purposive sampling, a non-probability sampling technique commonly employed in phenomenological research to identify individuals who possess direct and meaningful experiences relevant to the phenomenon under investigation. Eligible participants met the following criteria: (1) currently teaching English Language subjects in public schools; (2) have at least three years of teaching experience; (3) have intentionally integrated life sciences or environmental concepts into English language instruction;

and (4) expressed willingness to participate voluntarily in the study. The selected participants were expected to provide rich narratives that would facilitate a deeper understanding of interdisciplinary teaching experiences related to eco-literacy.

Research Instrument

The primary instrument for data collection was a researcher-developed semi-structured interview guide. Semi-structured interviews allowed participants to narrate their experiences openly while ensuring that all major aspects of the research questions were explored systematically. The interview guide consisted of broad, open-ended questions focusing on participants' experiences in integrating life sciences into English Language curricula, instructional strategies employed, challenges encountered, facilitating factors, perceived impacts on learners, and recommendations for improving interdisciplinary sustainability education. Follow-up probing questions were used whenever necessary to clarify responses and encourage deeper reflection. Prior to data collection, the interview guide underwent expert validation by specialists in qualitative research, English Language curricula, curriculum studies, and environmental education to ensure its clarity, relevance, and alignment with the study objectives.

Data Collection Procedure

Upon securing consent from the participants, the researcher explained the purpose of the study, voluntary nature of participation, confidentiality measures, and ethical safeguards. After obtaining written informed consent, individual virtual interviews were

scheduled based on participants' availability. Each interview lasted approximately 45 to 60 minutes and was audio-recorded with participants' permission. Field notes were simultaneously maintained to capture non-verbal cues, contextual observations, and researcher reflections. All interviews were transcribed verbatim immediately after data collection. Participants were subsequently provided copies of their interview transcripts for member checking, allowing them to verify the accuracy of their responses and clarify any ambiguities before data analysis commenced.

Data Analysis

The collected data were analyzed using the systematic procedures of Interpretative Phenomenological Analysis (IPA) as proposed by Smith, Flowers, and Larkin (2022). The analysis began with repeated reading of each transcript to facilitate immersion in the participants' narratives. Initial descriptive, linguistic, and conceptual notes were generated to identify significant statements and emerging meanings. These initial codes were then clustered into emergent themes within individual cases before conducting cross-case comparisons to identify shared patterns and unique experiences across participants. Superordinate themes were subsequently developed through interpretative synthesis while preserving the richness and individuality of participants' accounts. Throughout the analysis, reflexive journaling and peer debriefing were employed to strengthen interpretative rigor and minimize researcher bias. Direct participant quotations were incorporated to support thematic

interpretations and enhance the credibility of the findings.

Trustworthiness of the Study

To ensure the rigor of qualitative inquiry, the study adhered to Lincoln and Guba's (1985) criteria for trustworthiness, namely credibility, transferability, dependability, and confirmability. Credibility was established through prolonged engagement with participants, member checking, peer debriefing, and triangulation of interview data with field notes. Transferability was enhanced through rich, thick descriptions of the research context, participants, and instructional experiences, allowing readers to determine the applicability of the findings to similar educational settings. Dependability was maintained through detailed documentation of the research procedures, methodological decisions, and audit trails. Confirmability was achieved through reflexive journaling, audit documentation, and maintaining transparency throughout the research process to ensure that interpretations remained grounded in participants' narratives rather than researcher assumptions.

Ethical Considerations

Ethical principles were strictly observed throughout the conduct of the study. Participants were fully informed of the study's objectives, procedures, potential risks, and expected benefits before signing an informed consent form. Participation was entirely voluntary, and participants retained the right to withdraw from the study at any stage without consequence. Confidentiality and anonymity were protected using pseudonyms and the removal of personally

identifiable information from transcripts and reports. Digital recordings, interview transcripts, and research documents were securely stored in password-protected files accessible only to the researcher. The study likewise adhered to the principles of beneficence, non-maleficence, respect for persons, and justice in accordance with internationally accepted ethical standards for educational research.

Results and Discussion

Using Interpretative Phenomenological Analysis (IPA), four superordinate themes emerged from the lived experiences of English language teachers regarding the integration of life sciences into English Language curricula to advance eco-literacy. These themes reveal how teachers experience interdisciplinary instruction, the pedagogical practices they employ, the challenges they encounter, and the professional transformations that arise from integrating sustainability into language education.

Theme 1: Bridging Language Learning and Environmental Understanding Through Interdisciplinary Instruction

Participants described integrating life sciences into English Language curricula as an opportunity to transform traditional language lessons into meaningful learning experiences connected to real-world environmental issues. Rather than teaching language skills in isolation, they incorporated topics such as biodiversity, climate change, waste management, conservation, and ecosystem protection into reading comprehension, essay writing, oral communication, literary analysis, and

classroom discussions. This interdisciplinary approach enabled students to develop linguistic competence while simultaneously deepening their understanding of environmental sustainability.

English language teachers believed that contextualizing lessons using authentic environmental issues increased students' motivation, comprehension, and classroom participation. Learners became more engaged because instructional materials reflected contemporary societal concerns that directly affected their communities. Participants viewed language learning as a powerful avenue for cultivating environmental awareness through critical reading, reflective writing, persuasive communication, and collaborative dialogue.

One participant explained:

"Learners become more interested when we discuss environmental issues because they can relate them to what they experience in their communities. They are learning English while becoming more aware of protecting nature."

Another participant shared:

"Language is not only about grammar and vocabulary. It is also about communicating ideas that matter, and environmental sustainability is one of those important issues."

These experiences suggest that English Language curriculum provides authentic opportunities for interdisciplinary learning where language acquisition and environmental literacy reinforce one another.

Theme 2: Employing Innovative Pedagogical Strategies to Foster Eco-Literacy

Participants reported utilizing various learner-centered instructional strategies to integrate life sciences into English instruction. These included environmental storytelling, ecological literature analysis, reflective journals, persuasive essay writing, debates on environmental issues, project-based learning, multimedia presentations, documentary viewing, community-based environmental projects, and collaborative research activities. These pedagogical approaches encouraged students to analyze environmental problems critically while practicing essential language skills.

Teachers emphasized that inquiry-based discussions and authentic performance tasks enabled students to connect scientific knowledge with personal experiences and community realities. Instead of relying solely on textbook-based instruction, participants deliberately selected literary texts, newspaper articles, scientific reports, speeches, and documentaries addressing environmental themes to stimulate meaningful classroom discourse.

One participant remarked:

"I encourage students to write essays proposing solutions to environmental problems in our locality. They become more confident in expressing their ideas while realizing that they also have responsibilities toward the environment."

Another participant explained:

"Our debates on climate change allow students to practice speaking English while developing critical thinking about environmental issues and real-world context."

These findings demonstrate that integrating life sciences into English instruction enriches language learning by providing authentic communicative contexts that simultaneously promote environmental responsibility.

Theme 3: Navigating Instructional Challenges in Interdisciplinary Teaching

Although participants recognized the educational value of interdisciplinary instruction, they also encountered several challenges in integrating life sciences into English Language curricula. The most frequently reported barriers included limited instructional materials, curriculum constraints, and varying levels of student environmental knowledge.

Teachers expressed uncertainty regarding their scientific expertise when discussing complex environmental concepts. While they were comfortable facilitating language instruction, some felt inadequately prepared to explain scientific content comprehensively. Participants also noted that existing English curricula provide limited explicit guidance regarding interdisciplinary sustainability integration, requiring teachers to independently develop instructional materials and adapt learning resources.

One participant reflected:

"Sometimes I worry whether the scientific information I discuss is accurate because my specialization is English, not Science."

Another participant stated:

"Preparing interdisciplinary lessons requires much more time because I need to search for reliable environmental resources that also fit our language objectives."

Despite these constraints, participants remained committed to incorporating environmental topics into their instruction because they recognized their relevance to learners' holistic development.

Theme 4: Transforming Teacher Identity Through Sustainability-Oriented Language Education

Beyond improving classroom instruction, participants described how integrating life sciences into English Language curricula transformed their own professional identities. Many reported becoming more environmentally conscious, reflective, and committed to promoting sustainable practices within their schools and communities. Teaching environmental issues encouraged them to continuously update their knowledge, collaborate with science teachers, participate in environmental programs, and model environmentally responsible behaviors for their students.

Teachers viewed themselves not only as language educators but also as advocates of sustainability and responsible citizenship. They believed that integrating eco-literacy into English instruction expanded the social relevance of language education by preparing learners to become informed citizens capable of addressing environmental challenges through effective communication and critical thinking.

One participant shared:

"Teaching environmental topics has changed me as a teacher. I now realize that English classes can inspire students to care for the environment while improving their communication skills."

Another participant expressed:

"We are no longer simply teaching grammar. We are helping students become responsible citizens who can communicate solutions to environmental problems."

These narratives demonstrate that interdisciplinary sustainability education contributes to both teacher professional growth and the broader educational mission of fostering socially responsible learners.

Discussion

The findings indicate that integrating life sciences into English Language curricula extends the role of language instruction beyond the development of communication skills toward promoting environmental literacy, critical thinking, and sustainable citizenship. Participants consistently viewed eco-literacy as an educational responsibility that can be effectively cultivated through authentic language-learning experiences. Their lived experiences demonstrate that interdisciplinary teaching enhances learner engagement by connecting language instruction with contemporary environmental realities.

The study further reveals that successful integration depends largely on teachers' pedagogical creativity, interdisciplinary collaboration, institutional support, and professional preparedness. Although faculty

encountered challenges related to curriculum limitations, instructional resources, and interdisciplinary competence, these barriers did not diminish their commitment to sustainability education. Instead, they developed innovative teaching strategies that allowed environmental concepts to become meaningful contexts for reading, writing, speaking, and critical discourse.

Finally, the findings affirm that English language educators play a significant role in advancing **Education for Sustainable Development (ESD)**. By embedding life sciences into language instruction, they contribute not only to improved language proficiency but also to the formation of environmentally responsible citizens capable of addressing complex ecological challenges through informed communication, ethical reflection, and collaborative action. These insights underscore the importance of strengthening teacher professional development, interdisciplinary curriculum design, and institutional policies that support eco-literacy across all learning areas.

Conclusion

This phenomenological study explored the lived experiences of selected basic education and JHS English language teachers from Marinduque and Quezon regarding the integration of life sciences into English Language curricula to advance eco-literacy. The findings revealed that language educators perceive interdisciplinary teaching as a meaningful and transformative approach that enriches language learning while fostering environmental awareness, critical thinking, and sustainable citizenship. By embedding life sciences concepts into

reading, writing, speaking, and literary activities, teachers created authentic learning experiences that connected language instruction with real-world environmental issues. Such practices enabled learners to develop communication competencies alongside ecological consciousness, demonstrating that English Language curricula can significantly contribute to Education for Sustainable Development (ESD).

The study likewise found that language teachers employed diverse learner-centered pedagogical strategies, including environmental literature, reflective writing, debates, inquiry-based discussions, project-based learning, and collaborative classroom activities. These instructional approaches strengthened learner engagement by situating language acquisition within relevant environmental contexts. Participants emphasized that authentic environmental issues motivated students to communicate more meaningfully while developing a deeper appreciation of environmental stewardship and social responsibility.

Despite these positive experiences, participants also encountered several challenges that influenced the implementation of interdisciplinary instruction. Limited professional preparation in life sciences, insufficient instructional materials, curriculum constraints, and limited opportunities for interdisciplinary collaboration emerged as common barriers. These findings indicate that successful integration of eco-literacy requires continuous institutional support through professional development, curriculum

innovation, collaborative planning, and adequate instructional resources.

Moreover, the study demonstrated that integrating life sciences into English Language curricula transformed teachers' professional identities. Participants viewed themselves not only as language educators but also as facilitators of environmental awareness, ethical reflection, and sustainable development. Their lived experiences illustrate that interdisciplinary teaching strengthens both teacher professionalism and learner development by expanding the educational role of English Language teachers beyond language proficiency toward cultivating environmentally responsible citizens.

Overall, the findings affirm that eco-literacy can be effectively advanced through English Language curricula when life sciences are intentionally integrated into language instruction. The study contributes to the growing body of knowledge on interdisciplinary education by providing empirical evidence that language classrooms can serve as powerful venues for promoting sustainability, environmental literacy, and responsible global citizenship. Consequently, integrating life sciences into English Language curricula represents a promising educational strategy that supports curriculum innovation, teacher development, and the realization of sustainable education in the Philippine context.

Recommendations

Based on the findings of the study, the following recommendations are offered:

1. **Curriculum developers** may strengthen the integration of eco-literacy within English Language curricula by incorporating environmental themes, sustainability concepts, and interdisciplinary learning activities into curriculum guides, instructional materials, and assessment practices.
2. **Teacher education institutions** may consider enhancing pre-service and in-service training programs by providing English language educators with interdisciplinary competencies related to life sciences, environmental communication, sustainability education, and Education for Sustainable Development.
3. **School administrators** may encourage interdisciplinary collaboration between language teachers, science educators, environmental practitioners, and curriculum specialists to develop contextualized instructional materials and innovative classroom practices that promote eco-literacy.
4. **The Department of Education** may formulate policies and professional development initiatives that support interdisciplinary sustainability education across learning areas while providing adequate instructional resources, environmental learning materials, and institutional support for teachers.
5. **English language teachers** are encouraged to continuously integrate

authentic environmental issues into reading, writing, speaking, and literary instruction to cultivate students' communication skills, critical thinking, environmental awareness, and civic responsibility.

6. **Future researchers** may replicate this study in other educational settings using larger participant groups, comparative qualitative designs, mixed-method approaches, or longitudinal studies to further examine the long-term impact of interdisciplinary eco-literacy initiatives on teachers and learners across different educational contexts.

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