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Education for Sustainable Development in Pacific Higher Education: An Exploratory Mixed-Methods Study of Lecturer's Readiness in Vanuatu

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***Abstract*: Education for Sustainable Development (ESD) has become a strategic priority for higher education institutions seeking to equip graduates with the knowledge, skills, and values required to address increasingly complex environmental, social, and economic challenges. In Small Island Developing States (SIDS) such as Vanuatu, where communities are highly vulnerable to climate change and natural hazards, higher education plays a critical role in developing national resilience and supporting sustainable development. Despite growing policy commitments to sustainability, little empirical evidence exists regarding the readiness of higher education lecturers to integrate ESD into their teaching. This study was conducted to investigate lecturers' readiness to integrate Education for Sustainable Development into higher education in Vanuatu. The study adopted an exploratory mixed-methods design using a structured questionnaire comprising Likert-scale and open-ended questions. Invitations were sent to lecturers across three higher education institutions; responses were received from the National University of Vanuatu (NUV), the Vanuatu Agriculture College (VAC), and the University of the South Pacific (USP) - Vanuatu Campus. The final sample comprised seventeen lecturers. The data were analysed quantitative data using descriptive statistics and Cronbach's alpha for reliability, while the study examined qualitative responses through thematic analysis. The findings indicate that lecturers generally recognise the importance of ESD and demonstrate positive attitudes towards embedding sustainability within higher education curricula. Participants acknowledged the relevance of sustainability across disciplines and expressed willingness to incorporate ESD principles into their teaching. However, the study found that readiness was constrained by several interrelated challenges, including limited professional development opportunities, insufficient teaching resources, curriculum rigidity, competing academic priorities, and inconsistent institutional support. Respondents also highlighted the importance of integrating indigenous knowledge (kastom), community engagement, and locally relevant sustainability issues into curriculum design, reflecting the unique environmental and cultural context of Vanuatu. The study concludes that strengthening lecturer readiness requires coordinated institutional leadership, continuous professional learning, curriculum reform, and enhanced investment in sustainability education. By providing one of the first empirical investigations of lecturer readiness for ESD in Vanuatu's higher education sector, this research contributes context-specific evidence to the growing body of literature on sustainability education in Small Island Developing States and offers practical recommendations for higher education institutions seeking to advance the United Nations Sustainable Development Goals, particularly Sustainable Development Goal 4 on quality education.**

***Keywords*: Education for Sustainable Development, Higher Education, Lecturer Readiness, Sustainability Education, Vanuatu, Small Island Developing States, Climate Change Education, Indigenous Knowledge.**

1. Introduction

Sustainable development has emerged as one of the defining policy and educational priorities of the twenty-first century. Accelerating climate change, biodiversity loss, environmental degradation and growing social inequalities have intensified demands for education systems to prepare graduates capable of addressing complex sustainability challenges. The escalating impacts of climate change, biodiversity loss, environmental degradation, resource scarcity and widening social inequalities have intensified the need for education systems to prepare graduates capable of addressing complex sustainability challenges. Graduates today require more than just technical proficiency; they need interdisciplinary knowledge, critical thinking, and a capacity for responsible decision-making. Recognising this imperative, the United Nations identified Education for Sustainable Development (ESD) as a key mechanism for achieving the Sustainable Development Goals (SDGs), particularly Sustainable Development Goal 4.7, which emphasises equipping learners with the knowledge, skills, values, and attitudes necessary to promote sustainable development (United Nations, 2015; UNESCO, 2020).

Higher education institutions occupy a central position in advancing sustainable development. We educate future professionals, generate research, and engage with communities to address local and global challenges. Universities are increasingly expected to move beyond teaching sustainability as a specialised discipline and instead embed sustainability principles across curricula, institutional governance, research, and community engagement (Leal Filho, Shiel and Paço, 2018). This whole-institution approach recognises that graduates from all disciplines including agriculture, business, education, health, engineering, and social sciences require sustainability competencies to contribute effectively to national and global

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development.

Within the Pacific region, higher education institutions play an increasingly important role in supporting climate adaptation, sustainable livelihoods and community resilience. Sustainability initiatives should be contextualised within Melanesian leadership traditions and local educational realities rather than relying solely on imported educational models (Sanga and Reynolds, 2019). Furthermore, indigenous and local knowledge systems provide valuable foundations for sustainability education and natural resource management across Pacific Island communities (McMillen et al., 2017). Our countries experience disproportionate impacts from climate change despite contributing minimally to global greenhouse gas emissions. Rising sea levels, tropical cyclones, coastal erosion, food insecurity, freshwater scarcity, and biodiversity loss threaten economic development and community wellbeing across the Pacific region (IPCC, 2023; SPREP, 2023). Consequently, higher education institutions in Pacific Island countries have an important responsibility to prepare graduates capable of strengthening climate resilience, promoting sustainable resource management and supporting evidence-informed policy development.

Vanuatu represents one of the world's most environmentally vulnerable nations. Frequently ranked among the countries at highest risk of natural hazards, it is exposed to tropical cyclones, earthquakes, volcanic activity, tsunamis, flooding, and the long-term impacts of climate change. The agriculture, fisheries, tourism, and coastal livelihoods remain highly dependent on healthy ecosystems, making sustainable development a national priorityof Vanuatu. It is noted that the Government of Vanuatu has demonstrated a strong commitment to sustainability through the National Sustainable Development Plan (2016–2030), the Vanuatu Climate Change and Disaster Risk Reduction Policy (2016–2030), and the Vanuatu Education and Training Sector Strategy, all of which recognise education as a fundamental driver of climate resilience and sustainable development.

Despite these national commitments, it has been observed that embedding Education for Sustainable Development within higher education remains a complex undertaking. Successful implementation depends not only on institutional policies but also on the readiness of lecturers who design curricula, facilitate learning, assess students, and influence graduate competencies. In this study, lecturer readiness is conceptualised as comprising five interrelated dimensions: knowledge of sustainability concepts, pedagogical confidence in delivering Education for Sustainable Development (ESD), attitudes towards sustainability education, perceptions of institutional support, and the capacity to embed sustainability principles across diverse disciplinary contexts (Du, Li and Yang, 2022; Yang, Li and Du, 2024). However, while institutional policies may provide an enabling framework for sustainability integration, their effectiveness can be constrained by several practical challenges, including limited opportunities for professional development, inadequate teaching and learning resources, curriculum rigidity, and competing academic responsibilities. These factors may influence lecturers' ability and confidence to translate sustainability commitments into meaningful educational practices.

Although there has been considerable research examining sustainability education in universities across Europe, Australia, and parts of Asia, empirical evidence from Pacific Small Island Developing States remains limited. Existing studies have largely focused on institutional sustainability initiatives, climate change education, or curriculum development, with comparatively little attention given to the preparedness of university lecturers responsible for delivering sustainability education. In the Vanuatu context, where higher education institutions operate within a unique environment characterised by climate vulnerability, limited resources, and pressing sustainable development challenges, the absence of context-specific evidence creates a significant knowledge gap. Without empirical understanding of lecturers' current readiness and perceived barriers, higher education institutions and policymakers face challenges in designing targeted professional learning programmes, developing appropriate institutional support mechanisms, and implementing effective curriculum reforms aligned with Education for Sustainable Development and the Sustainable Development Goals. Therefore, this study seeks to address this gap by investigating the readiness of lecturers at the National University of Vanuatu (NUV) to integrate Education for Sustainable Development into teaching and learning practices, generating context-specific evidence to inform institutional strategies, professional development initiatives, and sustainability-oriented curriculum transformation.

Using an exploratory mixed-methods approach, to the authors' knowledge, this is among the first empirical studies to examine lecturers' readiness to integrate Education for Sustainable Development across multiple higher education institutions in Vanuatu. By focusing on a Pacific Small Island Developing State (SIDS), the study contributes context-specific evidence to an area of sustainability education research that remains comparatively underexplored. This study draws on survey data collected from lecturers at the National University of Vanuatu (NUV), the Vanuatu Agriculture College (VAC), and the University of the South Pacific (USP) - Vanuatu Campus. It examines lecturers' knowledge, attitudes, teaching practices, perceived barriers, and recommendations for strengthening the integration of Education for Sustainable Development (ESD) within higher education. By generating empirical evidence from an underrepresented Pacific Small Island Developing State (SIDS) context, the study contributes to the growing international scholarship on ESD implementation while providing context-specific insights for higher education institutions seeking to enhance sustainability-oriented teaching and learning practices.

A. Research Questions and Contribution of the Study

The study was guided by the following research questions:

RQ1: What is the level of lecturers' readiness to integrate Education for Sustainable Development (ESD) into higher education teaching and learning in Vanuatu?

RQ2: What individual and institutional factors influence

lecturers' readiness to implement Education for Sustainable Development within higher education institutions?

RQ3: What barriers and enabling conditions affect the integration of sustainability education within Vanuatu's higher education sector?

RQ4: What strategies do lecturers identify as necessary to strengthen the implementation of Education for Sustainable Development in Vanuatu?

By addressing these questions, this study seeks to address this gap by investigating lecturers' readiness to integrate Education for Sustainable Development across three higher education institutions in Vanuatu: the National University of Vanuatu (NUV), the Vanuatu Agriculture College (VAC), and the University of the South Pacific (USP) – Vanuatu Campus.. Theoretically, it contributes to the expanding body of scholarship on educator readiness for Education for Sustainable Development by providing empirical insights from a Small Island Developing State (SIDS) context that remains underrepresented in international research. The study extends current understanding of how individual competencies, institutional conditions, and contextual realities shape ESD implementation within resource-constrained higher education environments.

Practically, the findings aim to inform evidence-based strategies for curriculum enhancement, lecturer professional development, institutional policy development, and sustainability-oriented strategic planning. The study provides relevant insights for higher education institutions in Vanuatu and other Pacific Island nations seeking to strengthen their contribution to sustainable development, climate resilience, and the achievement of the Sustainable Development Goals (SDGs). The findings may also inform regional policy discussions on sustainability education across Pacific Island higher education systems, where empirical evidence on lecturers' readiness remains limited

2. Literature Review

A. Education for Sustainable Development in Higher Education

Education for Sustainable Development (ESD) has emerged as a transformative approach that enables learners to acquire the knowledge, competencies, values, and behaviours necessary to contribute to sustainable societies. Education for Sustainable Development differs from traditional environmental education by integrating environmental integrity, social equity, cultural diversity and economic sustainability into teaching, research, institutional governance and community engagement (UNESCO, 2020). ESD integrates environmental integrity, social equity, cultural diversity, and economic sustainability within teaching, research, institutional governance, and community engagement (UNESCO, 2020). Education for Sustainable Development requires transformative learning approaches that promote critical thinking, systems thinking and action competence (Tilbury, 2011). The objective is not only to increase awareness of sustainability challenges but also to develop graduates capable of critical thinking, systems thinking, ethical reasoning, collaboration, and informed decision-making in addressing complex local and global issues.

I recognise that higher education institutions have a unique responsibility in achieving the Sustainable Development Goals (SDGs). Universities educate future leaders, professionals, policymakers, researchers, and educators whose decisions influence sustainable development across multiple sectors. Consequently, I see international frameworks increasingly advocating a whole-institution approach, whereby sustainability is embedded not only within individual courses but also throughout institutional policies, campus operations, research agendas, and partnerships with local communities (Leal Filho, Shiel and Paço, 2018; Žalėnienė and Pereira, 2021). This shift requires universities to move beyond isolated environmental programmes and integrate sustainability competencies across all academic disciplines.

My review of the literature indicates that universities adopting institution-wide sustainability strategies produce graduates who are better equipped to address interdisciplinary sustainability challenges (Lozano, Ceulemans and D'hondt, 2015). Nevertheless, I have noted that implementation remains uneven across countries and institutions, particularly in developing nations where financial, human, and institutional resources are limited. Consequently, the evidence suggests that translating sustainability policies into effective classroom practice continues to represent one of the major challenges facing higher education worldwide. Despite growing international endorsement of the whole-institution approach, implementation remains uneven, particularly in resource-constrained higher education systems where financial limitations, competing institutional priorities and limited staff capacity restrict the mainstreaming of sustainability across teaching, research and governance.

B. Lecturer Readiness for Education for Sustainable Development

Successful implementation of Education for Sustainable Development depends largely on lecturers who design curricula, facilitate learning, assess student outcomes and model sustainable practices. Lecturer readiness, as I define it in this study, extends beyond subject knowledge to include attitudes towards sustainability, pedagogical competence, confidence, self-efficacy, institutional support, and the willingness to adopt interdisciplinary teaching approaches (Du, Li and Yang, 2022; Yang, Li and Du, 2024)

Previous research I have reviewed consistently reports that lecturers generally recognise the importance of sustainability education and express positive attitudes towards integrating ESD into their teaching. However, I have also found that positive attitudes do not necessarily translate into effective classroom implementation. Numerous studies identify barriers including limited professional development, insufficient pedagogical training, curriculum overload, lack of institutional incentives, inadequate teaching resources, and uncertainty regarding how sustainability can be embedded within non-environmental disciplines (Evans, White and King, 2017; Yang, Li and Du, 2024).

Self-efficacy has emerged as a particularly important determinant of lecturer readiness in my analysis. Bandura's (1997) theory suggests that educators with stronger self-efficacy are more likely to adopt innovative pedagogical practices, persist when encountering challenges and successfully implement curriculum reforms. Within the context of ESD, self-efficacy therefore provides an appropriate theoretical lens for understanding lecturers' readiness to integrate sustainability into teaching practice. Conversely, it is observed that lecturers who lack confidence often rely on conventional lecture-based instruction and may perceive sustainability as peripheral to their disciplinary expertise.

Continuous professional development plays a critical role in strengthening lecturer readiness. Professional learning programmes focusing on sustainability competencies, curriculum integration, assessment strategies and interdisciplinary collaboration have been shown to improve both educator confidence and student learning outcomes. Consequently, institutional investment in lecturer development is increasingly recognised as essential for advancing Education for Sustainable Development within higher education.

Although studies conducted in Europe (Leal Filho, Shiel and Paço, 2018), China (Du, Li and Yang, 2022) and international reviews (Yang, Li and Du, 2024) consistently report positive lecturer attitudes towards Education for Sustainable Development, they also identify persistent institutional barriers that limit implementation. Similar challenges appear particularly relevant within Small Island Developing States, where limited resources, competing institutional priorities and limited organisational capacity may further constrain the effective integration of sustainability into higher education teaching and learning. This gap highlights the need for context-specific research that examines lecturer readiness within Pacific Island higher education institutions, including those in Vanuatu.

C. Education for Sustainable Development in Small Island Developing States

The implementation of Education for Sustainable Development presents distinct challenges and opportunities within Small Island Developing States (SIDS). These countries possess unique ecological, economic, and cultural characteristics that influence higher education systems. I have identified limited financial resources, relatively small academic communities, geographical isolation, vulnerability to natural hazards, and dependence on climate-sensitive sectors such as agriculture, fisheries, and tourism as factors that shape the context in which universities operate (Dakaica, 2005).

For Pacific Island countries, the evidence suggests that Education for Sustainable Development assumes even greater significance given our extreme vulnerability to climate change and natural disasters. I have observed that rising sea levels, coastal erosion, and tropical cyclones directly threaten the livelihoods and wellbeing of communities across the region. Consequently, the study suggests that higher education institutions in the Pacific have a fundamental responsibility to prepare graduates capable of strengthening national resilience and supporting sustainable resource management. Sustainability initiatives in Pacific higher education should be contextualised within Melanesian leadership traditions and local educational realities rather than relying solely on imported educational models (Sanga and Reynolds, 2019).

Regional collaboration has also emerged as a critical strategy for advancing ESD in the Pacific. I have noted that the University of the South Pacific (USP), as a regional institution, has been a leader in climate change education and sustainability initiatives. However, the evidence suggests that national universities and colleges also play a vital role in addressing context-specific sustainability challenges and preparing graduates for local development needs.

I also place significant importance on the integration of indigenous knowledge and community engagement in my conceptualisation of ESD in SIDS. Traditional ecological knowledge and customary resource management practices provide valuable insights for addressing sustainability challenges within Pacific Island contexts (McMillen et al., 2017). The study suggests that Education for Sustainable Development should therefore move beyond international frameworks and incorporate locally relevant knowledge systems and community perspectives. Recent United Nations reports continue to emphasise that higher education institutions in Small Island Developing States play a strategic role in strengthening resilience, sustainable development and climate adaptation (UN-OHRLLS, 2024).

D. Conceptual Framework

The conceptual framework adopted in this study recognises that lecturers' readiness to integrate Education for Sustainable Development is shaped by the interaction of individual and institutional factors. These characteristics influence lecturers' willingness and capacity to incorporate sustainability into curriculum design, teaching practices, assessment, and student engagement.

At the institutional level, the study suggests that readiness is influenced by organisational leadership, curriculum flexibility, institutional policies, access to teaching resources, opportunities for professional development, interdisciplinary collaboration, and organisational support for sustainability initiatives.

The evidence suggests the interaction between these individual and institutional dimensions ultimately determines the extent to which Education for Sustainable Development is embedded within higher education teaching and learning. Accordingly, the conceptual framework I have developed for this study positions lecturer readiness as the central construct, influenced by:

- *Individual factors:* sustainability knowledge, attitudes, self-efficacy, teaching experience, and professional learning.
- *Institutional factors:* leadership support, curriculum integration, policy environment, teaching resources, interdisciplinary collaboration, and professional development.
- *Outcome:* effective integration of Education for Sustainable Development into higher education

teaching and learning.

The conceptual framework proposes that lecturers possessing strong sustainability knowledge, positive attitudes, high self-efficacy and access to supportive institutional environments are more likely to integrate Education for Sustainable Development effectively into teaching practice. Conversely, limited institutional support, insufficient professional development and curriculum constraints may reduce lecturers' readiness despite positive attitudes towards sustainability.

3. Methodology

A. Research Philosophy

In conducting this study, I was guided by the pragmatist research philosophy. I recognise that understanding complex educational issues benefits from the integration of quantitative and qualitative evidence. Pragmatism, as I apply it, places emphasis on addressing practical research problems by selecting methods that best answer the research questions rather than adhering to a single philosophical tradition (Creswell and Creswell, 2023). Given that lecturer readiness for Education for Sustainable Development (ESD) encompasses measurable attitudes and perceptions as well as personal experiences and contextual factors, I considered a pragmatic approach to be the most appropriate.

B. Research Design

An exploratory mixed-methods research design was employed. Data were collected quantitative data using structured Likert-scale questions to assess lecturers' knowledge, attitudes, confidence, current practices, and perceived institutional support regarding ESD. I gathered qualitative data through open-ended questions that enabled participants to elaborate on perceived barriers, opportunities, and recommendations for strengthening sustainability education.

The evidence suggests the combination of quantitative and qualitative methods provided a richer understanding of lecturer readiness than either approach alone. My quantitative findings identified overall patterns, while the qualitative responses provided contextual explanations relevant to the Vanuatu higher education setting.

C. Study Context

The researcher conducted the study within Vanuatu's higher education sector, focusing on institutions involved in teaching programmes related to education, agriculture, environmental management, and other tertiary disciplines.

Invitations were distributed electronically to academic staff at three higher education institutions:

- National University of Vanuatu (NUV)
- Vanuatu Agriculture College (VAC)
- University of the South Pacific (USP) -- Emalus Campus

Invitations were distributed electronically to academic staff at the National University of Vanuatu (NUV), the Vanuatu Agriculture College (VAC), and the University of the South Pacific (USP) – Vanuatu Campus. Responses were received from all three institutions, with one completed questionnaire submitted by a lecturer from USP. Although the number of USP respondents was limited, its inclusion broadened the institutional perspective of the study.

D. Participants and Sampling

The study adopted a purposive sampling strategy because I specifically targeted lecturers involved in tertiary teaching who were considered most likely to engage with sustainability-related education.

The final sample consisted of 17 lecturers representing three higher education institutions in Vanuatu, including 10 lecturers (58.8%) from the Vanuatu Agriculture College, six lecturers (35.3%) from the National University of Vanuatu, and one lecturer (5.9%) from the University of the South Pacific (USP) – Vanuatu Campus.

Although the sample size is modest, the evidence suggests it represents an important exploratory dataset within the context of Vanuatu's relatively small higher education sector. I intended for the findings to provide context-specific insights rather than statistical generalisations to all higher education institutions.

E. Research Instrument

Data were collected data using a structured online questionnaire I developed from the literature on Education for Sustainable Development, teacher readiness, sustainability competencies, and higher education curriculum integration.

The questionnaire I designed consisted of five sections:

- Demographic information.
- Knowledge and awareness of Education for Sustainable Development.
- Attitudes and perceptions towards integrating ESD.
- Current teaching practices and institutional support.
- Open-ended questions exploring perceived barriers, opportunities, and recommendations.

I measured most closed-ended items using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). I designed the questionnaire to measure multiple dimensions of lecturer readiness, including sustainability knowledge, pedagogical confidence, institutional support, and current implementation practices.

F. Data Collection

Data were collected data electronically during the study period using an online questionnaire. Participation was voluntary, and I informed respondents of the purpose of the research before they completed the survey.

To maximise participation, I distributed invitations through institutional communication channels. Despite my follow-up reminders, I received 1 completed questionnaire from lecturers at the University of the South Pacific (USP).

G. Data Analysis

The data were analysed quantitative data using descriptive statistical techniques. I calculated frequencies, percentages, means, and standard deviations to summarise respondents' characteristics and perceptions regarding Education for Sustainable Development.

Where appropriate, I developed a composite lecturer

readiness index by combining related questionnaire items to provide an overall indication of readiness for ESD integration. I assessed the internal consistency of the multi-item scales using Cronbach's alpha, considering values of 0.70 or above indicative of acceptable reliability.

The data were analysed qualitative responses using thematic analysis following the six-stage approach proposed by Braun and Clarke (Braun and Clarke, 2021). I read responses repeatedly to ensure familiarity with the data before I generated initial codes. I then grouped similar codes into broader themes describing lecturers' experiences, perceived barriers, enabling factors, and recommendations for strengthening Education for Sustainable Development in higher education.

The evidence suggests the integration of quantitative and qualitative findings enabled triangulation of the results, enhancing the credibility and interpretive depth of my study.

H. Trustworthiness and Rigour

The study adopted several measures to enhance the quality of my research. I informed the questionnaire with internationally recognised literature on Education for Sustainable Development and lecturer readiness, thereby supporting content validity. I used standardised survey procedures for all participants to ensure consistency in data collection.

The evidence suggests the inclusion of both quantitative and qualitative data strengthened methodological triangulation by enabling the interpretation of statistical trends alongside participants' personal perspectives. I evaluated the reliability of the quantitative scales using Cronbach's alpha, while I developed qualitative findings through systematic coding and theme refinement to enhance credibility and dependability.

I. Ethical Considerations

Ethical principles guided all stages of my research. Participation was voluntary and respondents were informed about the purpose of the study before they completed the questionnaire. Participants provided informed consent and assured them that their responses would remain confidential and anonymous.

I report no identifying information in this paper, and I present all findings in aggregated form to protect participants and their institutions. I used data exclusively for academic research purposes and stored it securely in accordance with accepted research ethics principles.

J. Study Limitations

This study has several limitations. First, my sample size was relatively small, reflecting both the size of Vanuatu's higher education sector and the voluntary nature of participation. Second, although I invited lecturers from three higher education institutions to participate, I obtained responses only from the National University of Vanuatu and the Vanuatu Agriculture College. Consequently, my findings may not fully represent the perspectives of lecturers across all higher education institutions in Vanuatu.

Third, I relied on self-reported perceptions, which may be influenced by social desirability bias or respondents' interpretations of Education for Sustainable Development. Nevertheless, The evidence suggests the integration of quantitative and qualitative data provides valuable exploratory evidence regarding lecturer readiness in a national context where empirical research remains limited.

4. Results

A. Respondent Profile

Respondents represented three higher education institutions in Vanuatu. The Vanuatu Agriculture College contributed ten respondents (58.8%), the National University of Vanuatu contributed six respondents (35.3%), and the University of the South Pacific (USP) – Vanuatu Campus contributed one respondent (5.9%).

Table 1
Distribution of respondents by institution

Institution	Frequency	Percentage(%)
VAC	10	58.8
NUV	6	35.3
USP	1	2
Total	17	100

The evidence suggests this respondent profile provides an exploratory representation of lecturers currently teaching within two of Vanuatu's higher education institutions. Although the sample is relatively small, it reflects the realities of our country's higher education sector and offers valuable context-specific evidence.

B. Lecturer Readiness Dimensions

The quantitative data were analysed using descriptive statistics to examine lecturers' readiness across four primary dimensions: knowledge, attitudes, practices, and perceived barriers. Mean scores and standard deviations were calculated for each dimension using a five-point Likert scale. The internal consistency of each scale was assessed using Cronbach's alpha coefficient to evaluate the reliability of the measurement instrument.

Table 2
Summary of readiness dimensions and reliability

Dimension	Mean Score (1-5)	Standard Deviation	Cronbach's Alpha (α)
Knowledge	3.44	0.84	0.829
Attitudes	3.60	0.84	0.943
Practices	3.62	1.16	0.946
Barriers	3.38	1.11	0.843

All four scales demonstrated good to excellent internal consistency (Cronbach's α = 0.829–0.946), indicating satisfactory reliability of the measurement instrument.

Respondents demonstrated a moderate to high level of knowledge regarding Education for Sustainable Development (M = 3.44, SD = 0.84). Most lecturers recognised the relevance of sustainability to higher education and acknowledged its importance in preparing graduates to address environmental, social and economic challenges. However, several respondents indicated that additional professional development would strengthen their understanding of contemporary ESD pedagogies and curriculum integration strategies.

Lecturers reported positive attitudes towards Education for Sustainable Development (M = 3.60, SD = 0.84). Respondents generally agreed that higher education institutions should play a leading role in promoting sustainable development and that sustainability should be embedded across academic programmes rather than being confined to environmentally focused disciplines. These findings indicate strong conceptual support for ESD among participants.

Although respondents expressed positive attitudes towards ESD, the integration of sustainability into teaching practices was more variable (M = 3.62, SD = 1.16). Several lecturers reported incorporating sustainability through case studies, fieldwork, community engagement and problem-based learning activities. Others indicated that sustainability was addressed only occasionally because of curriculum constraints, limited teaching resources and competing teaching responsibilities. These findings suggest that positive attitudes alone are insufficient to ensure consistent implementation of ESD across programmes.

C. Perceived Barriers to ESD Integration

My quantitative and qualitative findings identified several recurring barriers that influence lecturer readiness.

The most frequently reported challenges I identified included:

- Time for curriculum redesign (M = 3.94)
- Curriculum overload (M = 3.38)
- Limited teaching and learning resources (M = 3.31)
- Inadequate institutional support (M = 3.50)
- Insufficient professional development (M = 2.75)

Overall, the findings indicate that lecturer readiness is influenced not only by individual knowledge and attitudes but also by institutional conditions. Time required for curriculum redesign (M = 3.94) emerged as the most significant barrier, followed by inadequate institutional support (M = 3.50), curriculum overload (M = 3.38) and limited teaching and learning resources (M = 3.31). Although insufficient professional development received a comparatively lower mean score (M = 2.75), qualitative responses suggested that lecturers still viewed additional training as essential for strengthening ESD implementation.

D. Relationship between Attitudes and Practices

To examine whether lecturers' attitudes towards Education for Sustainable Development (ESD) were associated with their implementation of sustainability-related teaching practices, a Pearson correlation analysis was conducted. As illustrated in Figure 4, a very weak positive correlation was observed between attitudes and teaching practices ($r = 0.116$, $p = 0.657$; $n = 17$). The relationship was not statistically significant, indicating that lecturers with more positive attitudes towards ESD were not necessarily more likely to integrate sustainability into their teaching practices.

Although respondents generally expressed favourable attitudes towards Education for Sustainable Development, these attitudes did not consistently translate into classroom implementation. This finding suggests that factors beyond individual attitudes such as institutional support, curriculum flexibility, access to teaching resources, workload, and opportunities for professional development may play a more influential role in determining whether lecturers integrate sustainability into their teaching. These findings support the conceptual framework adopted in this study, which proposes that lecturer readiness is shaped by the interaction between individual and institutional factors rather than by attitudes alone.

The relationship between lecturers' attitudes and implementation practices indicated that positive attitudes were generally associated with greater integration of sustainability into teaching. However, considerable variability remained, suggesting that favourable attitudes alone do not guarantee implementation. These findings support the conceptual framework adopted in this study, which proposes that institutional conditions mediate the relationship between individual readiness and classroom practice.

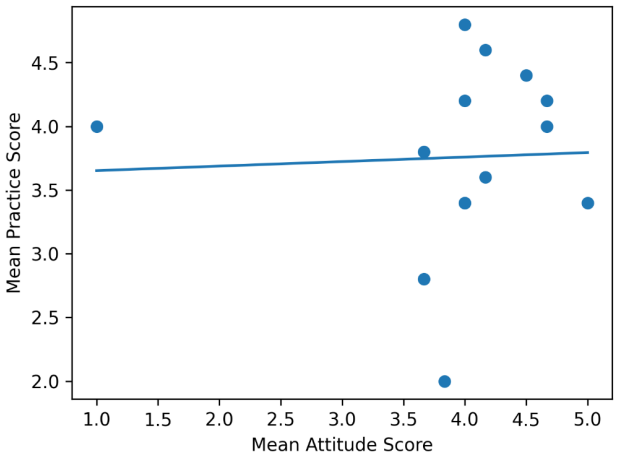

Fig. 1. Relationship between lecturers' attitudes towards Education for Sustainable Development (ESD) and sustainability teaching practices

The scatter plot illustrates the association between mean attitude scores and mean teaching practice scores among respondents. The fitted trend line indicates a weak positive relationship, suggesting that favourable attitudes towards ESD do not necessarily translate into greater implementation of sustainability practices in teaching.

Note: Only respondents with complete responses for all attitude and teaching practice items were included in the correlation analysis.

E. Qualitative Findings

Thematic analysis of the open-ended responses identified three dominant themes: (1) professional development and capacity building, (2) institutional support and resources, and (3) integration of indigenous knowledge within sustainability education. These themes complement the quantitative findings by providing greater insight into lecturers' experiences and perceived needs.

Professional Development and Capacity Building: Respondents expressed a clear desire for training. One lecturer noted:

"I would benefit from practical training on Education for Sustainable Development (ESD), climate-smart agriculture, sustainable farming practices, curriculum integration, and project-based learning. Workshops that include hands-on field activities, teaching resources, and assessment strategies would help me effectively integrate sustainability into my lessons."

Another emphasised the need for staying current:

"I would like more training on teaching to support my professional development, given opportunities to attend agricultural conferences and workshops to stay up to date with current agricultural interventions happening in Vanuatu in real time."

These responses demonstrate that lecturers are motivated to strengthen their ESD competencies but require structured opportunities for professional learning that combine theoretical understanding with practical classroom application.

Institutional Support and Resources: The study found that institutional support emerged as one of the most influential dimensions. One respondent stated:

"Institutional support through curriculum reform, increased funding for practical resources, and clear sustainability policies would make it easier to teach sustainability effectively."

The findings indicate that institutional commitment remains an essential enabling factor. Participants consistently emphasised that curriculum reform, leadership support and investment in teaching resources are necessary to facilitate meaningful integration of sustainability within higher education.

Indigenous Knowledge and Contextualisation: A strong theme in my data was the importance of kastom. Respondents consistently argued for its integration:

"Traditional Ni-Vanuatu knowledge (kastom) should be systematically integrated into higher education curricula by combining indigenous practices, cultural values, and community-based knowledge with scientific approaches to sustainability and climate resilience..."

Another suggested:

"Embed Kastom Knowledge into the Curriculum Instead of teaching kastom as a side topic, it should be part of core subjects, For example, Include traditional practices in modules like: Soil management (traditional fallow systems)"

The prominence of indigenous knowledge within participants' responses highlights the importance of contextualising Education for Sustainable Development within Pacific cultural traditions. Rather than viewing kastom as supplementary knowledge, respondents advocated integrating indigenous environmental knowledge alongside scientific approaches to create locally relevant and culturally responsive sustainability education. These findings support previous research highlighting the value of indigenous knowledge systems in advancing sustainable resource management within Pacific Island contexts (McMillen et al., 2017; Sanga and Reynolds, 2019).

F. Institutional Perspectives

Although only one respondent participated from the University of the South Pacific (USP) – Vanuatu Campus, the response provided an additional regional perspective on Education for Sustainable Development. The respondent emphasised the importance of curriculum review, laboratory infrastructure, collaboration with international partners and the careful integration of traditional Ni-Vanuatu knowledge into higher education curricula. These observations reinforce the broader findings of the study by highlighting the need for institution-wide support and contextually relevant approaches to sustainability education across Vanuatu's higher education sector.

5. Discussion

This study examined lecturers' readiness to integrate Education for Sustainable Development (ESD) within higher education institutions in Vanuatu. The findings indicate that lecturers generally recognise the importance of sustainability education and demonstrate positive attitudes towards embedding ESD in teaching. However, positive attitudes alone did not consistently translate into classroom implementation, as institutional, pedagogical and resource-related barriers constrained practice. These findings reinforce international evidence that successful ESD implementation depends on both individual commitment and supportive institutional environments. Furthermore, sustainability initiatives should be contextualised within Melanesian leadership traditions and local educational realities rather than relying solely on imported educational models (Sanga and Reynolds, 2019).

A. Lecturer Readiness for Education for Sustainable Development

The findings indicate that lecturers demonstrated a generally positive level of readiness to integrate Education for Sustainable Development (ESD) into higher education. Respondents demonstrated awareness of sustainability concepts and acknowledged the importance of preparing graduates capable of addressing environmental, social, and economic challenges. The generally positive level of lecturer readiness observed in this study aligns with UNESCO's (2020) conceptualisation of Education for Sustainable Development (ESD) as an educational approach that equips learners with the knowledge, competencies, values and behaviours necessary to contribute to sustainable development. This suggests that lecturers recognise the broader educational purpose of ESD beyond environmental awareness, encompassing social, economic and cultural dimensions of sustainability.

The positive attitudes demonstrated by lecturers are consistent with previous studies conducted in Australia, Europe

and Asia, which have reported that university educators generally support sustainability education despite recognising limitations in their own preparedness to implement Education for Sustainable Development (Du, Li and Yang, 2022). These findings indicate that a positive foundation for ESD already exists within Vanuatu's higher education sector. However, the weak relationship observed between lecturers' attitudes and their reported teaching practices suggests that positive attitudes alone are insufficient to ensure effective implementation. Institutional support, curriculum flexibility, access to teaching resources and professional development appear to be equally important in translating positive attitudes into meaningful classroom practice.

Although lecturers reported positive attitudes towards ESD, the quantitative analysis identified only a very weak, non-significant relationship between attitudes and teaching practices ($r = 0.116$, $p = 0.657$). This finding suggests that favourable attitudes alone are insufficient to ensure the effective integration of sustainability into classroom practice. Instead, institutional support, curriculum flexibility, professional development opportunities and access to teaching resources appear to play more influential roles in determining implementation. Similar observations have been reported by Du, Li and Yang (2022) and Yang, Li and Du (2024), who concluded that institutional conditions frequently moderate the relationship between educators' attitudes and their teaching practices.

Nevertheless, the study suggests that readiness should not be interpreted solely as positive attitudes. Social Cognitive Theory emphasises that self-efficacy influences whether individuals translate positive beliefs into practice (Bandura, 1997). Although my respondents recognised the value of ESD, qualitative responses indicated that many required additional professional learning, curriculum guidance, and practical teaching resources before feeling fully confident in embedding sustainability across their courses. This finding reinforces my view of the multidimensional nature of lecturer readiness, encompassing knowledge, confidence, skills, and institutional support.

B. Institutional Support as a Critical Enabler

Within the context of Vanuatu, strengthening institutional capacity is particularly important given the resource constraints faced by many higher education institutions. Strategic investment in lecturer development, curriculum reform and institutional leadership could therefore play a pivotal role in embedding sustainability across teaching, research and community engagement while supporting national sustainable development priorities.

These findings align with the Whole-Institution Approach advocated by UNESCO and other international organisations, which the evidence suggests argues that sustainability should be embedded throughout institutional governance, curriculum design, research, campus operations, and community engagement rather than relying solely on individual lecturers (Leal Filho, Shiel and Paço, 2018; UNESCO, 2020).

The findings indicate that institutional commitment must extend beyond policy statements to include practical mechanisms that enable lecturers to implement Education for Sustainable Development (ESD) effectively. Professional learning programmes, interdisciplinary collaboration, curriculum review processes and institutional recognition of sustainability teaching emerged as key institutional enablers. These findings reinforce the argument that successful ESD implementation requires coordinated organisational support rather than relying solely on individual lecturers' motivation. This interpretation is consistent with previous studies highlighting the importance of institutional leadership, supportive policies and capacity-building initiatives in embedding sustainability within higher education (Leal Filho, Shiel and Paço, 2018; Yang, Li and Du, 2024).

The inclusion of a respondent from the University of the South Pacific (USP) – Vanuatu Campus further reinforced the importance of institutional support. The respondent highlighted the need for curriculum review, enhanced laboratory infrastructure, collaboration with international partners and the careful integration of indigenous knowledge into higher education programmes. Although only one USP lecturer participated, these observations complemented the broader findings across the participating institutions and underscored the value of institution-wide approaches to sustainability education.

C. Professional Development and Capacity Building

Professional development emerged as one of the strongest themes across both my quantitative and qualitative findings. Respondents expressed a clear desire for training that would enhance their understanding of sustainability concepts, interdisciplinary pedagogy, assessment approaches, and curriculum integration.

The evidence suggests this finding reflects broader international research demonstrating that professional learning is one of the strongest predictors of successful ESD implementation (Evans, White and King, 2017; Du, Li and Yang, 2022). Lecturers may recognise the importance of sustainability while remaining uncertain about how to integrate complex sustainability issues within existing disciplinary content. I therefore argue that continuous professional development represents a strategic investment rather than an optional activity.

Within the Vanuatu context, the evidence suggests professional learning should be locally relevant and responsive to national development priorities. The study recommends that training programmes should incorporate climate resilience, sustainable agriculture, biodiversity conservation, disaster risk reduction, and community engagement while recognising the cultural and environmental realities of Pacific Island societies.

D. Indigenous Knowledge and Contextualised Sustainability Education

Indigenous knowledge systems remain critical for sustainability education in Pacific Island contexts (McMillen et al., 2017). I consider a distinctive contribution of this study to be the strong emphasis respondents placed on indigenous

knowledge and community engagement. Unlike many studies undertaken in larger higher education systems that I have reviewed, my respondents consistently recognised that sustainability education in Vanuatu should integrate customary knowledge, traditional environmental management practices, and local experiences alongside scientific perspectives.

This finding reflects my own increasing recognition that indigenous knowledge contributes significantly to climate adaptation, biodiversity conservation, and sustainable resource management within Pacific Island communities. The study suggests that integrating Ni-Vanuatu kastom into higher education not only strengthens cultural relevance but also promotes educational approaches that are responsive to local contexts and community needs.

Rather than viewing indigenous knowledge and scientific knowledge as competing systems, my respondents viewed them as complementary sources of learning that together strengthen sustainability education. The evidence suggests this perspective aligns with UNESCO's emphasis on culturally responsive Education for Sustainable Development and reinforces the importance of contextualising international sustainability frameworks within local realities.

These findings also support the argument that sustainability education within Pacific Island higher education should be grounded in local cultural knowledge and community practices. Integrating kastom alongside scientific knowledge creates opportunities for culturally responsive teaching while strengthening the relevance of sustainability education for Pacific learners (McMillen et al., 2017; Sanga and Reynolds, 2019).

E. Implications for Higher Education Policy and Practice

The findings have several important implications for higher education institutions and policymakers in Vanuatu.

First, curriculum review processes should ensure that sustainability competencies are progressively embedded across academic programmes rather than being confined to environment-related disciplines. Graduates in education, agriculture, business, tourism, health and other fields require sustainability competencies that are relevant to their respective professions. Embedding ESD across disciplines will help prepare graduates to address complex environmental, social and economic challenges within Vanuatu and the wider Pacific region.

Second, higher education institutions should establish structured professional development programmes that equip lecturers with practical strategies for integrating Education for Sustainable Development (ESD) into curriculum design, teaching, assessment and community engagement. Such programmes should promote interdisciplinary collaboration, strengthen pedagogical confidence and provide opportunities for lecturers to share good practice in sustainability education.

Third, institutional leadership should develop clear sustainability strategies supported by adequate resources, interdisciplinary collaboration and robust mechanisms for monitoring and evaluating progress. Institutional commitment should extend beyond policy development to include practical initiatives that strengthen lecturers' confidence and promote the consistent integration of Education for Sustainable Development (ESD) across teaching, research and community engagement.

Beyond Vanuatu, these findings have broader implications for higher education institutions across Pacific Small Island Developing States (SIDS). Many institutions operate under similar constraints, including limited financial resources, small academic communities and high vulnerability to climate change. Consequently, strategies that strengthen lecturer capacity, institutional leadership and locally contextualised sustainability education may also be relevant to other Pacific Island nations seeking to advance the Sustainable Development Goals. Sustainability initiatives should also be contextualised within Melanesian leadership traditions and local educational realities to ensure that institutional reforms remain culturally relevant and responsive to Pacific contexts (Sanga and Reynolds, 2019).

Finally, partnerships between universities, government agencies, local communities, non-governmental organisations and regional institutions should be strengthened to support sustainability education through collaborative research, field-based learning and the integration of indigenous knowledge into academic programmes. Such partnerships can enhance institutional capacity, promote knowledge exchange and ensure that Education for Sustainable Development reflects both international sustainability frameworks and the cultural, environmental and socio-economic realities of Pacific Island communities (McMillen et al., 2017).

F. Contribution to Knowledge

This study makes three principal contributions to the literature on Education for Sustainable Development (ESD) in higher education. They are as follows:

1. It provides one of the earliest empirical examinations of lecturers' readiness to integrate Education for Sustainable Development across multiple higher education institutions in Vanuatu, thereby addressing an important gap in the literature on Pacific Small Island Developing States (SIDS). Given the limited empirical research on ESD implementation within Pacific higher education, the study contributes valuable context-specific evidence from an underrepresented region.
2. The integration of quantitative and qualitative evidence demonstrates that lecturer readiness is shaped by the interaction between individual competencies and institutional conditions. The findings indicate that while lecturers generally possess positive attitudes towards ESD, successful implementation also depends on institutional leadership, professional development opportunities, curriculum flexibility and access to teaching resources. These findings support the conceptual framework adopted in this study by highlighting the complementary roles of educator self-efficacy and organisational support in advancing sustainability

education.

3. The study highlights the importance of contextualising sustainability education within Pacific Island higher education through the meaningful incorporation of indigenous knowledge, community engagement and Melanesian educational perspectives. Rather than relying solely on international policy frameworks, the findings demonstrate that locally grounded approaches can strengthen the relevance, cultural responsiveness and long-term sustainability of ESD implementation. Sustainability initiatives should therefore be contextualised within Melanesian leadership traditions and local educational realities to ensure that institutional reforms remain culturally appropriate and responsive to Pacific contexts (Sanga and Reynolds, 2019).

The findings demonstrate that lecturers across the participating higher education institutions in Vanuatu possess positive attitudes towards Education for Sustainable Development and recognise its importance in preparing graduates for sustainable futures. However, achieving meaningful and sustained implementation requires coordinated institutional leadership, targeted professional development, curriculum reform, adequate teaching resources and the meaningful integration of indigenous knowledge. Strengthening these dimensions will enhance the capacity of higher education institutions to contribute to national sustainable development priorities and the achievement of the Sustainable Development Goals within Vanuatu and across the wider Pacific region.

6. Implications, Limitations and Conclusion

A. Implications of the Study

The findings have important implications for higher education policy, institutional leadership, curriculum development and professional practice in Vanuatu. As the country continues to strengthen its commitment to sustainable development and climate resilience, higher education institutions have a critical responsibility to equip graduates with the knowledge, competencies and values required to address increasingly complex environmental, economic and social challenges. Achieving this objective requires institutional commitment that extends beyond policy statements to sustained investment in curriculum reform, lecturer capacity building and organisational support.

1) Policy Implications

The findings highlight the need for stronger national coordination in embedding Education for Sustainable Development (ESD) across Vanuatu's higher education sector. National education policies should explicitly recognise ESD as a cross-cutting educational priority aligned with the National Sustainable Development Plan (2016–2030), the Vanuatu Climate Change and Disaster Risk Reduction Policy and Sustainable Development Goal 4.7.

The Ministry responsible for higher education, together with the National University of Vanuatu (NUV), the Vanuatu Agriculture College (VAC), the University of the South Pacific (USP) – Vanuatu Campus and other tertiary providers, should collaborate to develop national guidelines for integrating sustainability competencies into higher education curricula. Such guidance would promote consistency while allowing institutions the flexibility to respond to local priorities and disciplinary needs.

2) Institutional Implications

The findings demonstrate that lecturer readiness depends not only on individual motivation but also on institutional conditions. Universities and colleges should therefore adopt a whole-institution approach to sustainability by embedding ESD within strategic planning, quality assurance processes, curriculum review, research priorities, campus operations and community engagement.

Institutional leadership should establish clear sustainability policies, allocate appropriate resources and create opportunities for interdisciplinary collaboration among academic staff. Formal recognition of sustainability-related teaching and research within academic performance and promotion processes may also encourage greater engagement with ESD initiatives.

3) Curriculum and Teaching Implications

The study recommends that curriculum development move beyond treating sustainability as a specialised topic within environmental programmes. Instead, the study suggests that sustainability competencies should be integrated progressively across all academic disciplines, including education, agriculture, business, health, tourism, engineering, and the social sciences.

Participants' strong emphasis on indigenous knowledge highlights the importance of designing curricula that combine internationally recognised sustainability principles with Ni-Vanuatu kastom, traditional ecological knowledge and community-based learning. Such an approach would strengthen the cultural relevance of higher education while supporting locally appropriate responses to climate change, biodiversity conservation, food security and disaster risk reduction. These findings reinforce the importance of contextualising sustainability initiatives within Melanesian leadership traditions and local educational realities (Sanga and Reynolds, 2019).

4) Professional Development Implications

Professional learning emerged as one of the strongest recommendations identified by participants. Higher education institutions should establish structured professional development programmes that enhance lecturers' knowledge of Education for Sustainable Development (ESD), innovative pedagogical approaches, interdisciplinary curriculum design, authentic assessment strategies and community-engaged learning.

Professional development should be continuous rather than one-off and should encourage collaboration among lecturers from different disciplines to facilitate the exchange of good practice and strengthen institutional capacity for sustainability education.

B. Limitations of the Study

The study involved a relatively small sample of seventeen lecturers drawn from three higher education institutions in Vanuatu. Although the sample reflects the scale of the participating institutions and provides valuable exploratory evidence, the findings should not be considered statistically representative of all higher education providers in Vanuatu or the wider Pacific region.

Although lecturers from three higher education institutions participated, only one completed questionnaire was received from the University of the South Pacific (USP) – Vanuatu Campus. Consequently, the findings primarily reflect the perspectives of lecturers from the National University of Vanuatu and the Vanuatu Agriculture College, with the USP response providing an additional institutional perspective rather than a representative view of that institution.

Another limitation is that the study relied on self-reported survey responses. Although participant anonymity was maintained to encourage honest responses, the findings may have been influenced by social desirability bias and differences in respondents' interpretations of Education for Sustainable Development.

Additionally, cross-sectional design captured lecturers' perceptions at a single point in time. As institutional priorities, policies and professional development opportunities evolve, lecturer readiness may also change. Longitudinal research would therefore provide valuable insights into how readiness for Education for Sustainable Development develops over time.

Finally, the study focused on lecturers' perceptions of readiness rather than direct observations of classroom practice or assessments of student learning outcomes. Future research incorporating classroom observations and student perspectives would provide a more comprehensive understanding of ESD implementation within Vanuatu's higher education sector.

C. Recommendations for Future Research

Based on the findings, the study suggests several directions for future research.

First, the study recommends larger-scale studies involving a broader range of higher education institutions in Vanuatu and other Pacific Island countries. Such research would provide a more representative understanding of lecturer readiness across the region and enable comparative analysis of sustainability education initiatives.

Second, the study suggests longitudinal research to examine how lecturer readiness evolves over time, particularly in response to institutional policies and professional development programmes. This would provide evidence regarding the effectiveness of different strategies for strengthening Education for Sustainable Development.

Third, the study recommends research that incorporates classroom observations and student assessments to examine the relationship between lecturer readiness, teaching practice, and student sustainability competencies. This would provide valuable insights into the impact of Education for Sustainable Development on graduate outcomes.

Finally, the study suggests further investigation into the integration of indigenous knowledge and community engagement within higher education curricula. The evidence suggests research examining successful examples of contextualised sustainability education would provide practical guidance for institutions seeking to strengthen the cultural relevance of their academic programmes.

D. Conclusion

This study examined lecturers' readiness to integrate Education for Sustainable Development (ESD) within higher education institutions in Vanuatu. The findings indicate that lecturers generally recognise the importance of sustainability and demonstrate positive attitudes towards embedding ESD within teaching and learning. However, readiness is constrained by several interrelated challenges, including limited professional development opportunities, insufficient teaching resources, curriculum rigidity, competing academic priorities and inconsistent institutional support.

The findings further demonstrate that successful implementation of Education for Sustainable Development requires coordinated institutional leadership, continuous professional learning, curriculum reform and sustained investment in sustainability education. Equally important is the meaningful integration of indigenous knowledge, kastom and community engagement within higher education curricula to ensure that sustainability education remains culturally relevant and responsive to the environmental and social realities of Vanuatu and the wider Pacific region.

By providing one of the earliest empirical investigations of lecturers' readiness for Education for Sustainable Development across multiple higher education institutions in Vanuatu, this study contributes valuable context-specific evidence to the growing body of literature on sustainability education in Pacific Small Island Developing States. The findings offer practical guidance for higher education institutions and policymakers seeking to strengthen lecturer capacity, embed sustainability across curricula and support the achievement of the Sustainable Development Goals through transformative higher education.

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