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From Fragmentation to Integration: Rethinking Strategic Leadership and Institutional Innovation in the Transition toward Sustainable Education Systems

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Abstract

This study critically examines the persistent fragmentation in the implementation of Education for Sustainable Development and advances a rethinking perspective on how sustainable education systems can be achieved through greater integration. Despite the growing global emphasis on sustainability, many educational institutions continue to adopt programmatic and isolated approaches, resulting in limited systemic impact. Addressing this gap, the study investigates how strategic leadership and institutional innovation can be reconceptualized to support the transition from fragmentation to integration.

Using a qualitative embedded case study design, this research draws on secondary data and employs thematic analysis combined with PESTEL Analysis to examine both internal institutional dynamics and external environmental influences. The findings reveal that institutions operate within a transitional sustainability model, characterized by incremental innovation, adaptive yet centralized leadership, and fragmented sustainability practices. This condition reflects a broader structural misalignment between sustainability goals and institutional capabilities.

The study argues that achieving sustainable education systems requires a fundamental shift from fragmented interventions toward systemic integration, where leadership and innovation are not treated as separate dimensions but as mutually reinforcing processes. In this context, strategic leadership must evolve into a more systemic and participatory form, while institutional innovation must be embedded, coordinated, and aligned with long-term sustainability objectives.

A key contribution of this research lies in rethinking the relationship between leadership and innovation as an integrated nexus that drives sustainability transformation within dynamic environmental contexts. By emphasizing the transition from fragmentation to integration, this study offers a novel conceptual framework for understanding and advancing sustainable education systems. The findings provide important implications for theory, practice, and policy, particularly in developing and resource-constrained contexts.

Keywords: *Sustainable Education Systems, Education for Sustainable Development (ESD), Strategic Leadership, Institutional Innovation, Sustainability Transition, Systemic Integration.*

1. Introduction

The escalating global challenges of environmental degradation, social inequality, and economic instability have intensified the urgency for transforming education systems toward sustainability. In response, the United Nations has articulated the *Sustainable Development Goals* (SDGs) as a comprehensive global agenda, positioning education as a central driver for achieving sustainable development (United Nations, 2015). Within this

framework, Education for Sustainable Development has emerged as a transformative paradigm that seeks to equip learners with the knowledge, skills, values, and attitudes necessary to address complex global challenges (UNESCO, 2020). However, despite its growing prominence in policy discourse, the effective integration of ESD into educational systems remains uneven and fragmented across different contexts.

A growing body of literature highlights that the implementation of ESD is often constrained by systemic and institutional barriers, particularly in developing countries. While national policies frequently endorse sustainability-oriented education, their translation into practice at the institutional level is limited (Filho et al., 2019; Tilbury, 2011). This gap between policy aspirations and practical implementation reflects deeper structural issues, including limited institutional capacity, rigid governance structures, and insufficient alignment between leadership practices and sustainability goals. Consequently, education systems continue to operate within traditional paradigms that prioritize standardized outcomes over transformative learning, thereby undermining the broader objectives of sustainability.

In this context, strategic leadership has been increasingly recognized as a critical factor in advancing ESD within educational institutions. Strategic leadership goes beyond administrative management by emphasizing vision-building, adaptive decision-making, and the capacity to navigate complex and uncertain environments (Davies & Davies, 2006; Hargreaves & Fink, 2006). Empirical studies suggest that leadership practices play a pivotal role in shaping organizational culture, fostering innovation, and facilitating the integration of sustainability principles into educational processes (Hallinger & Heck, 2010). However, the existing literature often treats leadership as a standalone variable, without integration into broader systemic frameworks that incorporate innovation and environmental dynamics.

Parallel to leadership, institutional innovation has also been identified as a key driver in transforming education systems toward sustainability. Innovation in education encompasses not only technological advancements but also pedagogical reforms, curriculum redesign, and organizational restructuring (Fullan, 2015). In the context of ESD, innovation is essential for developing interdisciplinary approaches, promoting experiential learning, and embedding sustainability across institutional practices (Wals, 2015). Nevertheless, innovation efforts frequently encounter resistance due to entrenched institutional norms, resource constraints, and misalignment with external environmental conditions. This underscores the need for a more holistic understanding of how innovation interacts with leadership and contextual factors in shaping sustainable education systems.

Despite the growing body of research on sustainability in education, the literature remains inherently fragmented, with limited integration between strategic leadership, institutional innovation, and Education for Sustainable Development as a coherent and systemic framework. Existing studies often examine these dimensions in isolation or adopt either a macro-level perspective focused on policy frameworks or a micro-level approach centered on localized institutional practices. As a result, there is insufficient understanding of how these elements interact dynamically to shape sustainability outcomes, particularly in terms of how educational institutions navigate the transition from fragmented and programmatic initiatives toward systemic and integrated approaches. This gap is especially pronounced in developing and resource-constrained contexts, where empirical evidence remains limited despite the heightened complexity of sustainability challenges. Consequently, the absence of integrative and context-sensitive frameworks restricts the ability of current research to fully explain the mechanisms through which leadership and innovation can be aligned within broader environmental conditions to enable meaningful and sustained transformation in education systems. This gap highlights the need for a more integrative and system-oriented framework that can explain the transition from fragmentation to integration in sustainable education systems.

To address this gap, this study adopts a comprehensive approach that integrates strategic leadership, institutional innovation, and environmental analysis within the framework of ESD. Specifically, the study draws on the PESTEL Analysis to examine how political, economic, social, technological, environmental, and legal factors shape the capacity of educational institutions to implement sustainability-oriented practices. By situating leadership and innovation within a broader environmental context, this approach provides a more nuanced understanding of the systemic conditions that enable or constrain the transformation of education systems.

Empirically, this study is grounded in a case study of a secondary-level educational institution in a developing country context. The case is used not merely as a descriptive account but as an analytical lens to explore how strategic leadership and institutional innovation are enacted in practice, and how they interact with external environmental pressures. This approach allows for the generation of contextually grounded insights while maintaining broader theoretical relevance. By abstracting from the specific institutional setting, the study aims to

contribute to a more generalizable understanding of sustainable education systems.

Theoretically, this research contributes to the literature by proposing an integrative framework that links strategic leadership and institutional innovation to the implementation of ESD within complex institutional environments. Unlike prior studies that treat these elements in isolation, this study emphasizes their interdependence and highlights the importance of contextual factors in shaping their effectiveness. This integrative perspective not only enriches the conceptual understanding of ESD but also responds to recent calls for more holistic and system-oriented approaches in sustainability research (Sterling, 2010; Lozano et al., 2015).

Practically, the findings of this study offer important implications for educational leaders, policymakers, and practitioners seeking to advance sustainability in education. By identifying the key drivers and barriers associated with leadership and innovation, the study provides actionable insights for designing strategies that align institutional practices with sustainability goals. Furthermore, the focus on a developing country context adds value by highlighting the unique challenges and opportunities faced by education systems in resource-constrained environments.

In summary, this study seeks to bridge the gap between theory and practice in the field of ESD by integrating strategic leadership, institutional innovation, and environmental analysis within a unified framework. Through a combination of conceptual development and empirical analysis, the research aims to advance both scholarly understanding and practical application of sustainable education systems in a rapidly changing global landscape.

2. Literature Review and Theoretical Framework

2.1 Education for Sustainable Development (ESD)

The concept of Education for Sustainable Development has emerged as a central pillar in global efforts to achieve sustainable development. Rooted in the agenda of the United Nations and operationalized through frameworks developed by UNESCO, ESD aims to transform education systems by integrating sustainability principles into all aspects of learning. Rather than focusing solely on knowledge transmission, ESD emphasizes transformative learning processes that enable individuals to critically engage with complex socio-ecological challenges (UNESCO, 2020).

Recent studies suggest that ESD requires a systemic approach that goes beyond curriculum reform and encompasses institutional culture, governance structures, and stakeholder engagement (Filho et al., 2019; Lozano-Díaz & Fernández-Prados, 2020). This perspective aligns with the notion of the *whole-institution approach*, which advocates for embedding sustainability across teaching, research, operations, and community outreach. However, despite its conceptual appeal, the implementation of ESD remains uneven, particularly in developing countries where institutional capacities are often constrained (Andriyanto & Senoaji, 2025).

Empirical evidence indicates that many educational institutions struggle to translate ESD policies into practice due to limited resources, lack of trained personnel, and insufficient alignment between national policies and institutional strategies (Lozano et al., 2015). Furthermore, ESD initiatives are frequently implemented in a fragmented manner, lacking coherence and long-term strategic direction. This highlights the need for integrative frameworks that can bridge the gap between policy and practice.

2.2 Strategic Leadership in Education

Strategic leadership has been widely recognized as a critical factor in driving educational transformation. Unlike traditional administrative leadership, strategic leadership focuses on long-term vision, adaptability, and the ability to respond to complex and dynamic environments (Hallinger, 2011). In the context of ESD, strategic leadership plays a pivotal role in aligning institutional goals with sustainability principles and fostering a culture of innovation.

Research shows that effective educational leaders act as change agents who facilitate organizational learning, empower stakeholders, and promote collaborative decision-making (Leithwood et al., 2020). These leadership practices are particularly important in advancing ESD, which requires interdisciplinary collaboration and systemic change. Moreover, strategic leadership is closely linked to the development of institutional capacity, which is essential for sustaining innovation and implementing long-term sustainability initiatives (Bahtiar & Qasabandiyah, 2025).

In developing country contexts, the role of leadership becomes even more critical due to the presence of structural constraints such as limited funding, bureaucratic rigidity, and socio-cultural barriers (Andriyanto & Senoaji, 2025). Leaders must therefore adopt adaptive strategies that balance global sustainability agendas with local realities. This requires not only technical expertise but also the ability to navigate complex institutional environments.

2.3 Institutional Innovation in Education

Institutional innovation refers to the processes through which educational organizations develop and implement

new ideas, practices, and structures to improve performance and respond to changing environments. In the context of sustainability, innovation is essential for rethinking traditional educational models and promoting transformative learning (Fullan, 2015).

Recent literature emphasizes that innovation in education is multidimensional, encompassing pedagogical, organizational, and technological aspects (OECD, 2020). Pedagogical innovation involves the adoption of learner-centered approaches, interdisciplinary curricula, and experiential learning methods. Organizational innovation includes changes in governance structures, leadership practices, and resource allocation. Technological innovation, on the other hand, focuses on the integration of digital tools to enhance learning and institutional efficiency.

Studies have shown that innovation is a key driver of ESD implementation, as it enables institutions to adapt to emerging sustainability challenges and develop context-specific solutions (Lozano-Díaz, A & Fernández-Prados, 2020). However, innovation processes are often hindered by institutional inertia, resistance to change, and lack of supportive policies (Lozano et al., 2015). This underscores the importance of leadership in facilitating innovation and creating an enabling environment for change.

2.4 External Environment and PESTEL Analysis

Educational institutions do not operate in isolation but are embedded within broader socio-economic and political contexts. Understanding these external factors is crucial for developing effective strategies to implement ESD. One widely used framework for analyzing the external environment is PESTEL Analysis, which examines political, economic, social, technological, environmental, and legal factors.

Political factors include government policies, regulatory frameworks, and national education agendas that influence institutional priorities. Economic factors relate to funding availability, resource allocation, and financial sustainability. Social factors encompass cultural values, demographic trends, and societal expectations. Technological factors involve the availability and adoption of digital tools. Environmental factors refer to ecological challenges and sustainability awareness, while legal factors include laws and regulations governing education systems (Yüksel, 2012).

In the context of ESD, PESTEL analysis provides a comprehensive framework for understanding the external constraints and opportunities that shape institutional practices. For example, supportive government policies can facilitate the integration of sustainability into education, while limited funding can hinder innovation efforts. Similarly, cultural attitudes toward sustainability can influence the acceptance and effectiveness of ESD initiatives.

2.5 Integrating Leadership, Innovation, and ESD

While the literature on ESD, leadership, and innovation has grown significantly, these elements are often studied in isolation. There is a lack of integrative frameworks that capture their interrelationships and combined impact on educational transformation. This represents a critical gap in the literature, particularly in the context of developing countries.

This study addresses this gap by proposing an integrative framework that links strategic leadership, institutional innovation, and ESD within a dynamic environmental context. In this framework, strategic leadership serves as the driving force that shapes institutional vision and facilitates change. Institutional innovation acts as the mechanism through which sustainability principles are operationalized. The external environment, analyzed through PESTEL, provides the contextual conditions that enable or constrain these processes.

The integration of these elements allows for a more holistic understanding of how education systems can transition toward sustainability. It highlights the importance of aligning internal capabilities with external conditions and emphasizes the need for adaptive strategies that respond to complex and evolving challenges.

2.6 Conceptual Framework and Propositions

Based on the literature, this study proposes the following conceptual relationships:

1. Strategic leadership positively influences the implementation of ESD by shaping institutional vision and fostering a culture of sustainability.
2. Institutional innovation mediates the relationship between leadership and ESD, enabling the translation of strategic goals into practical actions.
3. External environmental factors (PESTEL) moderate the effectiveness of leadership and innovation, influencing the extent to which ESD can be implemented.

This framework contributes to the literature by providing a comprehensive model that integrates multiple dimensions of educational transformation. It also offers a basis for empirical analysis, allowing for the examination of how these relationships manifest in real-world contexts.

3. Methodology

3.1 Research Design

This study employs a qualitative research approach using an embedded case study design to explore the interplay between strategic leadership, institutional innovation, and

the implementation of Education for Sustainable Development within a real-world educational setting. A case study approach is particularly appropriate for investigating complex social phenomena within their natural contexts, especially when the boundaries between the phenomenon and context are not clearly evident (Yin, 2018).

The choice of an embedded case study design allows for a more nuanced analysis by examining multiple dimensions within a single institutional context. Rather than focusing solely on outcomes, this approach facilitates an in-depth understanding of processes, interactions, and contextual dynamics that shape the implementation of sustainability-oriented practices. This is consistent with recent calls for more context-sensitive and system-oriented research in the field of ESD (Rosenberg, 2020).

3.2 Case Selection and Contextual Framing

This study adopts a purposive case selection strategy to examine the dynamics of strategic leadership and institutional innovation in advancing Education for Sustainable Development within a real-world educational setting. In qualitative research, purposive sampling is widely used to select information-rich cases that provide meaningful insights into the phenomenon under investigation (Yin, 2018).

The selected case represents a private secondary-level educational institution situated within a developing country context. Rather than treating the case as an isolated entity, this study positions it as an illustrative example of broader institutional conditions commonly found in resource-constrained educational environments. These conditions include limited access to financial and technological resources, evolving governance structures, and increasing pressure to align institutional practices with global sustainability agendas.

To avoid over-contextualization and enhance analytical generalizability, the case is deliberately anonymized and abstracted. This approach allows the study to focus on underlying mechanisms and patterns rather than context-specific details. Such abstraction is consistent with the principle of theoretical generalization, where findings are intended to contribute to broader conceptual understanding rather than statistical inference (Yin, 2018).

Furthermore, the contextual framing of this study emphasizes the interaction between internal institutional dynamics and external environmental pressures. By situating the case within a developing country context, the study captures the complexities and constraints that shape the implementation of sustainability-oriented practices. This includes challenges related to policy alignment, resource availability, and socio-cultural factors, which are critical in understanding the feasibility and effectiveness of ESD initiatives (Rosenberg, 2020).

Overall, the case is not presented as a unique or exceptional instance but as a representative context that reflects broader systemic issues in education systems undergoing sustainability transitions. This positioning strengthens the relevance of the findings and enhances their applicability to similar institutional settings.

3.3 Data Sources and Collection

This study relies primarily on qualitative secondary data derived from institutional documents, policy reports, and publicly available records related to the selected case. Secondary data analysis is particularly useful when examining organizational practices and policy implementation, as it allows researchers to access longitudinal and contextual information that may not be readily captured through primary data collection (Johnston, 2017).

The data sources include:

1. Institutional profiles and historical records
2. Strategic plans and policy documents
3. Reports on educational practices and programs
4. Relevant regulatory and policy frameworks

These data were selected based on their relevance to the research objectives and their ability to provide insights into leadership practices, innovation processes, and sustainability initiatives within the institution. The use of multiple data sources enhances the credibility and robustness of the analysis through data triangulation (Bowen, 2009).

3.4 Analytical Framework

To systematically analyze the data, this study adopts a dual analytical approach that integrates thematic analysis with PESTEL Analysis.

3.4.1 Thematic Analysis

Thematic analysis is used to identify, analyze, and interpret patterns within the data. This method is widely employed in qualitative research due to its flexibility and ability to provide rich, detailed insights into complex phenomena (Braun & Clarke, 2006). In this study, thematic analysis is applied to examine how strategic leadership and institutional innovation are manifested in the context of ESD.

The analysis follows a systematic process:

1. Data familiarization
2. Initial coding
3. Theme identification
4. Theme review and refinement
5. Interpretation and synthesis

This process enables the identification of key themes related to leadership practices, innovation strategies, and sustainability initiatives.

3.4.2 PESTEL Analysis

In addition to thematic analysis, this study employs PESTEL analysis to examine the external environment influencing the institution. PESTEL provides a structured framework for analyzing political, economic, social, technological, environmental, and legal factors that shape organizational behavior (Yüksel, 2012).

The integration of PESTEL analysis allows for a more comprehensive understanding of how external conditions interact with internal processes. For example:

1. Political factors may influence policy alignment with ESD
2. Economic conditions may affect resource availability
3. Social dynamics may shape stakeholder engagement
4. Technological developments may enable or constrain innovation

By combining thematic and PESTEL analyses, the study captures both internal dynamics and external influences, thereby providing a holistic perspective on the implementation of ESD.

3.5 Validity and Reliability

Ensuring the rigor of qualitative research is essential for producing credible and trustworthy findings. This study adopts several strategies to strengthen both validity and reliability through methodological transparency and analytical rigor. First, data triangulation is employed by drawing on multiple sources of secondary data, including institutional documents, policy reports, and relevant scholarly literature. This approach enables cross-verification of evidence and reduces the risk of bias associated with reliance on a single data source (Bowen, 2009). By comparing and corroborating insights across different types of data, the study enhances the credibility and consistency of its findings.

Second, the study maintains a clear and systematic analytical procedure, supported by a well-documented **audit trail**. This includes detailed documentation of data selection, coding processes, theme development, and analytical decisions throughout the research process. The audit trail ensures transparency and allows other researchers to trace the progression of the analysis, thereby strengthening the dependability and confirmability of the study (Yin, 2018). In addition, the use of established analytical approaches, namely thematic analysis and PESTEL Analysis, provides a structured and theoretically grounded basis for interpreting the data.

Finally, this study emphasizes analytical generalization rather than statistical generalization. The findings are not intended to be universally representative but are instead aimed at contributing to theory development and offering transferable insights for similar institutional contexts. By situating the findings within a broader conceptual framework, the study enhances its relevance and applicability beyond the immediate case while maintaining methodological rigor.

3.6 Ethical Considerations

Although this study relies on secondary data, ethical rigor is maintained by ensuring that all data sources are publicly accessible or properly cited, thereby upholding academic integrity and intellectual property rights. In addition, the study applies anonymization of the case institution to protect organizational confidentiality while preserving analytical validity. The research process also adheres to principles of transparency and responsible data use, ensuring that interpretations are conducted objectively and without misrepresentation.

3.7 Limitations of the Study

Despite its contributions, this study has several limitations. First, the reliance on secondary data may limit the depth of insights compared to primary data collection methods such as interviews or observations. Second, the use of a single case study may constrain the generalizability of the findings.

However, this limitation is mitigated by the study's focus on theoretical generalization and its integration of a robust conceptual framework. Future research could address these limitations by incorporating multiple case studies, employing mixed-method approaches, or conducting longitudinal analyses to capture changes over time.

4. Findings

4.1 Institutional Characteristics and Strategic Orientation

The findings indicate that the selected institution demonstrates a transitional orientation toward sustainability, characterized by a gradual alignment between institutional practices and the principles of Education for Sustainable Development. Rather than adopting a fully institutionalized sustainability framework, the institution exhibits a hybrid model in which conventional educational practices coexist with emerging sustainability-oriented initiatives.

This transitional condition reflects a broader pattern commonly observed in developing country contexts, where educational institutions are simultaneously influenced by global policy pressures and local structural constraints. The analysis reveals that sustainability is not yet embedded as a

core institutional value but is instead integrated in a fragmented and programmatic manner. For instance, sustainability-related activities are often implemented as discrete initiatives rather than as part of a coherent institutional strategy.

Despite these limitations, the institution demonstrates a clear strategic intent to adapt to evolving educational demands. This is evident in the gradual incorporation of sustainability themes into institutional discourse, as well as in efforts to modernize governance and instructional practices. However, the absence of a formalized sustainability framework limits the depth and consistency of these efforts

4.2 External Environment Analysis (PESTEL)

The external environment plays a significant role in shaping the institution's capacity to implement sustainability-oriented practices. Using PESTEL Analysis, the findings reveal a complex interplay of enabling and constraining factors.

Politically, the existence of a national education policy emphasizing character education and sustainability provides a framework supporting institutional transformation. However, policy implementation remains inconsistent, creating a gap between regulatory expectations and practical realities.

Economically, limited financial resources emerge as a critical constraint. Institutions operate in a resource-constrained environment, impacting their ability to invest in the infrastructure, technology, and capacity-building initiatives necessary for implementing Education for Sustainable Development (ESD).

Socially, institutions benefit from strong community engagement and cultural cohesion, which can serve as a foundation for promoting sustainability values. However, traditional mindsets and resistance to change can hinder the adoption of innovative practices. Meanwhile, technologically, institutions are showing moderate progress in adopting digital tools, although infrastructure limitations and uneven digital literacy levels remain challenges.

Environmentally, there is increasing awareness of sustainability issues, but this awareness has not yet translated into systematic institutional practices. When viewed legally, regulatory compliance requirements provide guidance and constraints, shaping institutional priorities and operational flexibility.

Table 1. Summary of PESTEL Analysis

Dimension	Key Findings	Implications for ESD Implementation
Political	Supportive policies but weak implementation	Opportunity with execution gaps
Economic	Limited funding and resource constraints	Major barrier to innovation
Social	Strong community values but resistance to change	Mixed impact
Technological	Moderate adoption of digital tools	Partial support for innovation
Environmental	Increasing awareness but low institutional integration	Untapped potential
Legal	Regulatory pressures and compliance requirements	Structural influence

4.3 Strategic Leadership Practices

The analysis reveals that leadership within the institution plays a pivotal role in driving incremental changes toward sustainability. Leadership practices are characterized by a combination of adaptive and participatory approaches, reflecting an effort to balance institutional constraints with the need for innovation.

Leaders within the institution demonstrate an awareness of global educational trends, including the importance of sustainability and innovation. This awareness is reflected in their strategic decisions, such as the introduction of new programs, efforts to improve educational quality, and attempts to foster a more dynamic learning environment. However, these initiatives are often reactive rather than proactive, indicating a limited capacity for long-term strategic planning.

Moreover, leadership practices tend to be centralized, with decision-making concentrated at the top level. While this structure allows for efficient coordination, it may limit broader stakeholder participation, which is essential for the successful implementation of ESD. The findings suggest that a more distributed leadership model could enhance institutional capacity and foster greater ownership of sustainability initiatives.

4.4 Institutional Innovation Dynamics

Institutional innovation within the case organization is evident but remains uneven and constrained by structural factors. Innovation efforts are primarily focused on incremental improvements rather than transformative changes. These include:

1. Modifications in teaching methods
2. Introduction of new extracurricular programs
3. Gradual integration of digital tools

While these initiatives indicate a willingness to innovate, they lack systemic integration and long-term strategic direction. Innovation is often driven by individual actors rather than institutionalized processes, making it vulnerable to discontinuity.

The findings also highlight the presence of institutional inertia, where existing routines and practices hinder the adoption of new approaches. This is particularly evident in areas such as curriculum design and organizational governance, where traditional models continue to dominate.

Table 2. Typology of Institutional Innovation

Type of Innovation	Examples Identified	Level of Impact	Key Constraints
Pedagogical	Interactive learning methods	Moderate	Limited teacher capacity
Organizational	Adjustments in management practices	Low–Moderate	Bureaucratic rigidity
Technological	Use of digital learning tools	Moderate	Infrastructure limitations
Programmatic	Sustainability-related activities/programs	Low	Lack of integration

4.5 Integration of Leadership, Innovation, and ESD

A key finding of this study is the partial and uneven integration of strategic leadership, institutional innovation, and ESD. While each element is present within the institution, their interaction is not yet fully optimized.

Leadership plays a facilitative role in initiating innovation, but the absence of a coherent strategic framework limits its effectiveness. Similarly, innovation efforts contribute to the advancement of sustainability goals but remain fragmented and insufficiently institutionalized. The external environment further shapes these dynamics by imposing both constraints and opportunities.

This fragmented integration results in a "transitional sustainability model," where institutions are in the process of adapting to sustainability demands but have not yet achieved systemic transformation. This finding underscores the importance of developing integrated strategies that align leadership, innovation, and environmental conditions.

Table 3. Integrated Findings: Leadership–Innovation–ESD Nexus

Dimension	Current Condition	Key Issue	Strategic Implication
Leadership	Adaptive but centralized	Limited participation	Need for distributed leadership
Innovation	Incremental and fragmented	Lack of systemic integration	Need for institutionalization
ESD Implementation	Partial and programmatic	Absence of holistic framework	Need for whole-institution approach
External Environment	Mixed opportunities and constraints	Resource and policy gaps	Need for adaptive strategies

5. Discussion

5.1 Reframing ESD Implementation: From Fragmentation to Systemic Integration

The findings of this study reveal that the implementation of Education for Sustainable Development within the observed institutional context remains fragmented and programmatic rather than systemic. This aligns with prior research indicating that many educational institutions struggle to move beyond symbolic or isolated sustainability initiatives toward holistic transformation (Lozano et al., 2015; Filho et al., 2019). While sustainability is increasingly recognized as a strategic priority, its integration into institutional structures, cultures, and practices remains incomplete.

From a theoretical perspective, this fragmentation can be understood as a manifestation of the "implementation gap" between policy and practice. Although global frameworks promoted by the United Nations and UNESCO emphasize the importance of a whole-institution approach, the translation of these frameworks into actionable strategies at the institutional level is often constrained by contextual

limitations. The findings reinforce the argument that ESD should not be treated as an add-on component but rather as a transformative paradigm that requires systemic integration across all institutional dimensions (Wals, 2025).

This study contributes to the literature by conceptualizing the observed condition as a **"transitional sustainability model"**, in which institutions are neither fully traditional nor fully transformed. This intermediate state is characterized by partial adoption, fragmented innovation, and evolving strategic intent. Recognizing this transitional phase is critical, as it highlights the non-linear and iterative nature of sustainability transformation in education.

The persistence of fragmented and programmatic implementation of Education for Sustainable Development, as identified in this study, reflects deeper structural and epistemic challenges within contemporary education systems. Rather than functioning as an integrated paradigm, ESD is often operationalized through isolated activities that are detached from the core institutional architecture. This condition suggests that sustainability has not yet been internalized as an organizing principle of educational systems but remains positioned at the periphery of institutional priorities. In many cases, sustainability initiatives are driven by external pressures, such as global policy frameworks promoted by the United Nations and UNESCO, rather than emerging organically from within institutional cultures. As a result, institutions tend to adopt a compliance-oriented approach, where sustainability is framed as a requirement to be fulfilled rather than a transformative agenda to be embedded. This reinforces the "implementation gap" not merely as a technical issue, but as a manifestation of misalignment between normative commitments and institutional capacities. Moreover, this gap is exacerbated by the persistence of traditional educational paradigms that prioritize standardized outcomes, rigid curricula, and hierarchical governance structures, all of which are inherently incompatible with the interdisciplinary, participatory, and adaptive nature of ESD.

Building on this analysis, the conceptualization of a **"transitional sustainability model"** provides a critical lens for understanding the evolutionary trajectory of educational institutions in navigating sustainability transformation. This model captures the inherent tension between continuity and change, where institutions simultaneously reproduce established practices while experimenting with new sustainability-oriented approaches. Importantly, this transitional state should not be interpreted as a failure, but rather as an inevitable phase in the process of systemic transformation. It reflects the reality that institutional change is path-dependent, shaped by historical legacies, resource constraints, and contextual dynamics. Within this framework, fragmentation and partial adoption can be seen as early indicators of transformation, signaling the emergence of new logics and practices that have yet to be fully consolidated. However, the risk lies in the possibility of stagnation, where institutions remain trapped in a cycle of incremental adaptation without achieving deeper structural change. To move beyond this transitional phase, it is essential to reframe ESD as a systemic intervention that requires alignment across multiple levels, including leadership, governance, pedagogy, and external engagement. This implies a shift from short-term, project-based initiatives toward long-term, strategic integration, where sustainability becomes embedded in the institutional DNA. Such a transformation demands not only technical adjustments but also a reconfiguration of values, power relations, and organizational cultures, thereby positioning ESD as a catalyst for profound and enduring change in education systems.

5.2 Strategic Leadership as a Catalyst for Sustainability Transformation

The findings underscore the central role of strategic leadership in shaping the trajectory of sustainability implementation. Consistent with existing literature, leadership is found to function as a key enabler of change by articulating vision, mobilizing resources, and fostering organizational learning (Hallinger, 2011; Leithwood et al., 2020). However, this study extends previous research by demonstrating that the effectiveness of leadership is contingent upon its ability to move beyond centralized control toward more distributed and participatory models.

In the observed case, leadership practices are adaptive but remain largely centralized, which limits the extent to which sustainability initiatives can be institutionalized. This finding resonates with the argument that hierarchical leadership structures may hinder innovation and reduce stakeholder engagement, particularly in complex and dynamic environments (Bush, 2020). ESD, by its very nature, requires collaborative and interdisciplinary approaches, which cannot be fully realized within rigid organizational structures.

Importantly, this study highlights the need to reconceptualize leadership in the context of sustainability as **"systemic leadership"** rather than merely strategic or transformational leadership. Systemic leadership emphasizes the ability to navigate complexity, integrate multiple perspectives, and align institutional practices with broader socio-ecological goals. This perspective contributes to the growing body of literature that calls for more holistic and adaptive leadership models in education.

Beyond its structural characteristics, the effectiveness of strategic leadership in advancing sustainability

transformation is also closely tied to its capacity to cultivate a shared institutional vision. The findings suggest that while leadership within the observed institution demonstrates awareness of sustainability imperatives, this awareness has not yet been fully translated into a collectively owned vision across organizational levels. This condition reflects a common challenge in implementing Education for Sustainable Development, where leadership vision remains concentrated at the top rather than diffused throughout the institution. From a theoretical standpoint, this highlights the importance of sensemaking processes in leadership, where leaders are not only responsible for setting direction but also for enabling stakeholders to interpret, internalize, and enact sustainability goals within their respective roles. Without such shared understanding, sustainability initiatives risk being perceived as externally imposed agendas rather than integral components of institutional identity.

Furthermore, the findings indicate that leadership effectiveness is influenced by its ability to foster organizational learning and reflexivity. In the context of sustainability, educational institutions are required to continuously adapt to evolving environmental, social, and technological challenges. This necessitates a learning-oriented leadership approach that encourages experimentation, critical reflection, and knowledge sharing. However, the persistence of centralized decision-making structures may limit opportunities for such learning processes to emerge organically. As a result, innovation remains episodic rather than continuous, and institutional responses to sustainability challenges tend to be reactive rather than anticipatory. This reinforces the argument that leadership for sustainability must extend beyond strategic planning to include the creation of enabling conditions for ongoing institutional learning and adaptation.

Finally, the transition toward what this study conceptualizes as "systemic leadership" requires a reconfiguration of power relations within educational institutions. Traditional leadership models often rely on formal authority and hierarchical control, which can constrain participation and inhibit collaborative problem-solving. In contrast, systemic leadership emphasizes distributed agency, where multiple actors contribute to decision-making and implementation processes. This shift is particularly important in advancing sustainability, as the complexity of socio-ecological challenges demands diverse perspectives and collective action. By redistributing leadership functions and empowering stakeholders, institutions can enhance their capacity to integrate sustainability across organizational boundaries. In this sense, systemic leadership is not merely an extension of existing leadership models but represents a paradigmatic shift toward more inclusive, adaptive, and networked forms of governance that are better suited to the demands of sustainable education systems.

5.3 Institutional Innovation: Between Incremental Change and Transformative Potential

Institutional innovation emerges as a critical mechanism through which sustainability principles are operationalized. However, the findings reveal that innovation within the observed institution is predominantly incremental rather than transformative. This is consistent with prior studies suggesting that educational innovation often occurs in small-scale, localized forms due to institutional inertia and resource constraints (OECD, 2020).

While incremental innovation can generate short-term improvements, it may be insufficient to address the complex and systemic challenges associated with sustainability. Transformative innovation, in contrast, requires fundamental changes in pedagogical approaches, organizational structures, and institutional cultures (Fullan, 2015). The limited presence of such transformative innovation in the findings suggests that institutions may be "trapped" in a cycle of partial adaptation, where change occurs but does not lead to systemic transformation.

This study contributes to the literature by identifying the conditions under which innovation can move from incremental to transformative. Specifically, it highlights the importance of:

1. Strong and adaptive leadership
2. Alignment with external environmental conditions
3. Institutionalization of innovation processes

Without these conditions, innovation remains fragmented and vulnerable to discontinuity.

Building on these findings, it is important to recognize that the persistence of incremental innovation is not merely a limitation, but also a reflection of the adaptive strategies employed by institutions operating under constrained conditions. In many cases, incremental innovation functions as a pragmatic response to limited resources, institutional rigidity, and risk aversion. Small-scale changes, such as adjustments in teaching practices or the introduction of new programs, allow institutions to experiment without disrupting existing structures. However, while such an approach may enhance short-term resilience, it often lacks the coherence and scalability required for long-term sustainability transformation. This creates a paradox in which institutions continue to innovate, yet remain structurally unchanged. From this perspective, incremental innovation can be seen as both an enabler and a constraint: it initiates change but may simultaneously delay deeper transformation by reinforcing existing institutional logics.

Moreover, the transition from incremental to transformative innovation requires a shift from isolated initiatives toward system-level integration. Transformative innovation is not simply a matter of increasing the intensity of change, but of reconfiguring the relationships between different components of the institution, including curriculum, governance, and stakeholder engagement. This process involves redefining institutional priorities, redistributing resources, and fostering a culture that supports experimentation and long-term thinking. Crucially, such transformation depends on the alignment between internal innovation processes and external environmental dynamics, including policy frameworks, technological developments, and societal expectations. Without this alignment, even well-designed innovations may fail to achieve meaningful impact. Therefore, advancing sustainability in education requires not only the generation of innovative practices but also their integration into a coherent institutional strategy, ensuring that innovation becomes a continuous and embedded process rather than a sporadic or fragmented activity.

5.4 The Role of External Environment: A PESTEL Perspective

The application of PESTEL Analysis provides important insights into how external environmental factors shape the implementation of ESD. The findings demonstrate that sustainability transformation is not solely an internal process but is deeply influenced by political, economic, social, technological, environmental, and legal conditions.

For instance, supportive policy frameworks create opportunities for institutional change, but inconsistent implementation limits their effectiveness. Similarly, economic constraints significantly restrict the institution's capacity to invest in innovation and infrastructure. These findings align with previous research emphasizing the importance of contextual factors in shaping educational outcomes (Yüksel, 2012).

One of the key contributions of this study is the integration of PESTEL analysis into the study of ESD, which has been relatively underexplored in the literature. By incorporating external environmental analysis, this study provides a more comprehensive understanding of the systemic conditions that enable or constrain sustainability transformation.

Building on these findings, the political dimension of the external environment plays a particularly decisive role in shaping the direction and intensity of sustainability transformation within educational institutions. Government policies, national education agendas, and regulatory frameworks often serve as the primary drivers that legitimize and prioritize Education for Sustainable Development initiatives. However, the effectiveness of these policies depends not only on their formulation but also on their consistency, clarity, and enforceability. In many developing contexts, policy discontinuity and fragmented governance structures create uncertainty, which in turn limits institutional commitment to long-term sustainability strategies. As a result, institutions may adopt a cautious or compliance-oriented approach, focusing on meeting minimum requirements rather than pursuing transformative change.

From an economic perspective, resource availability emerges as a fundamental constraint that directly affects the scope and sustainability of innovation efforts. Limited funding restricts investments in infrastructure, professional development, and technological integration, all of which are critical for advancing ESD. This economic constraint often forces institutions to prioritize operational stability over strategic transformation, thereby reinforcing incremental rather than transformative innovation. At the same time, financial limitations can also stimulate creativity and resourcefulness, encouraging institutions to develop low-cost, contextually relevant solutions. This dual role of economic factors highlights the complex relationship between resource constraints and innovation capacity, suggesting that financial challenges, while restrictive, can also act as catalysts for adaptive strategies.

The social and technological dimensions further illustrate the multifaceted nature of external influences on sustainability implementation. Socially, cultural values, community expectations, and stakeholder perceptions significantly shape the acceptance and effectiveness of ESD initiatives. In contexts where sustainability is not yet deeply embedded in societal norms, institutions may encounter resistance or limited engagement from stakeholders. Conversely, strong community support can enhance the legitimacy and impact of sustainability programs. Technologically, the increasing availability of digital tools presents new opportunities for innovation in teaching, learning, and institutional management. However, disparities in access and digital literacy can create uneven adoption, limiting the transformative potential of technology. This underscores the need for institutions to not only adopt technological solutions but also ensure their equitable and effective utilization.

Finally, environmental and legal factors provide both normative direction and structural boundaries for sustainability transformation. Growing global awareness of environmental issues creates a sense of urgency that influences institutional priorities and stakeholder expectations. At the same time, legal frameworks establish the rules and standards that govern institutional behavior, shaping the extent to which sustainability can be integrated into educational practices. However, overly rigid

regulations may constrain innovation, while weak enforcement can reduce policy effectiveness. These findings suggest that the external environment should not be viewed merely as a set of constraints but as a dynamic system of interrelated factors that both enable and limit institutional transformation. By systematically analyzing these dimensions through PESTEL Analysis, this study demonstrates the importance of aligning internal strategies with external conditions to achieve meaningful and sustained progress in ESD implementation.

5.5 Toward an Integrated Framework of Sustainable Education Systems

A central contribution of this study lies in its development of an integrated framework that links strategic leadership, institutional innovation, and ESD within a dynamic environmental context. The findings demonstrate that these elements are deeply interdependent and cannot be effectively understood in isolation.

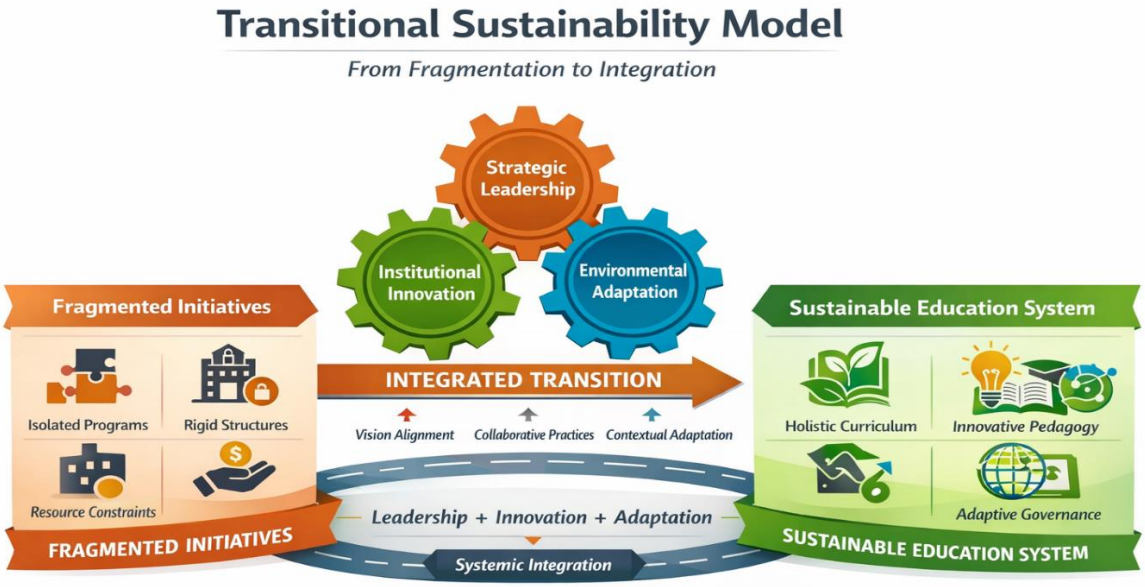

Figure 1. Transitional Sustainability Model: From Fragmentation to Integration

As illustrated in Figure 1, the transitional sustainability model captures the dynamic shift from fragmented institutional practices toward an integrated and systemic approach, mediated by strategic leadership, institutional innovation, and environmental conditions.

The proposed framework suggests that:

1. Strategic leadership provides direction and vision
2. Institutional innovation serves as the operational mechanism
3. The external environment shapes opportunities and constraints

This integrative perspective advances the literature by moving beyond fragmented approaches and offering a more holistic understanding of sustainable education systems. It also responds to recent calls for system-oriented research that captures the complexity of sustainability challenges (Sterling, 2010).

Furthermore, the concept of a **"leadership–innovation–ESD nexus"** introduced in this study provides a useful analytical lens for examining how different elements interact to produce sustainability outcomes. This nexus highlights the importance of alignment and coherence, suggesting that the effectiveness of sustainability initiatives depends not only on individual components but also on their integration.

Building on this integrative perspective, it is important to emphasize that the strength of the proposed framework lies not only in identifying the key components of sustainability transformation but also in explicating the dynamic interactions among them. Strategic leadership, institutional innovation, and Education for Sustainable Development are not linear variables operating in a cause–effect sequence; rather, they form a recursive and mutually reinforcing system. For instance, leadership does not merely initiate innovation but is simultaneously shaped by the outcomes of innovation processes and feedback from the institutional environment. Similarly, innovation is not only a product of leadership direction but can also redefine institutional priorities and reshape leadership practices over time. This recursive interaction underscores the need to conceptualize sustainable education systems as adaptive and evolving entities, where change emerges through continuous feedback loops rather than one-directional interventions.

Moreover, the integrated framework highlights the critical importance of coherence across multiple levels of the institution. In many cases, the failure of sustainability

initiatives can be attributed to misalignment between strategic intentions and operational practices, or between internal capabilities and external expectations. The "leadership–innovation–ESD nexus" proposed in this study addresses this challenge by emphasizing the need for synchronization between vision, implementation, and contextual adaptation. This implies that successful sustainability transformation requires not only strong individual components but also their alignment within a unified strategic architecture. From a practical standpoint, this calls for the development of integrated planning mechanisms, cross-functional collaboration, and continuous monitoring systems that ensure consistency across institutional domains. Ultimately, this framework contributes to a deeper understanding of how educational institutions can move from fragmented and episodic efforts toward a more coherent, systemic, and sustainable mode of operation.

5.6 Implications for Theory and Practice

5.6.1 Theoretical Implications

This study offers several important contributions to the theoretical development of Education for Sustainable Development by advancing a more integrative and context-sensitive understanding of sustainability transformation in education systems. First, the introduction of the **"transitional sustainability model"** provides a nuanced conceptual lens for understanding how educational institutions evolve toward sustainability. Unlike binary perspectives that categorize institutions as either sustainable or non-sustainable, this model captures the intermediate and dynamic nature of institutional change, where elements of traditional practices coexist with emerging sustainability-oriented initiatives. This conceptualization is particularly relevant for developing country contexts, where transformation processes are often gradual, iterative, and constrained by structural limitations.

Second, this study contributes to the literature by developing an integrated framework that connects strategic leadership, institutional innovation, and ESD within a unified analytical structure. While previous studies have examined these elements separately, the present research demonstrates that their effectiveness is inherently interdependent. Strategic leadership alone is insufficient without the operationalization provided by innovation, and innovation efforts are unlikely to be sustained without supportive leadership and conducive environmental conditions. By highlighting this interdependence, the study responds to recent calls for more systemic and holistic approaches in sustainability research.

Third, the incorporation of external environmental analysis through the PESTEL Analysis extends the theoretical scope of ESD studies. Existing literature has often focused on internal institutional dynamics, overlooking the broader contextual forces that shape educational transformation. By integrating PESTEL into the analytical framework, this study provides a more comprehensive perspective that captures the interaction between internal capabilities and external constraints. This approach enriches the theoretical discourse by emphasizing that sustainability in education is not only an institutional challenge but also a systemic one.

5.6.2 Practical Implications

From a practical perspective, the findings of this study offer valuable insights for educational leaders and institutional practitioners seeking to advance sustainability within their organizations. One of the key implications is the need to move beyond fragmented and programmatic approaches toward a more holistic, whole-institution strategy. The findings indicate that isolated sustainability initiatives, while beneficial in the short term, are insufficient to drive long-term transformation. Instead, institutions should aim to embed sustainability principles across all dimensions of their operations, including curriculum design, governance structures, and organizational culture.

Furthermore, the study highlights the critical role of leadership in facilitating this transformation. Educational leaders are encouraged to adopt more distributed and participatory leadership models that actively engage stakeholders at all levels of the institution. Such an approach not only enhances institutional capacity but also fosters a sense of ownership and collective responsibility for sustainability initiatives. In this regard, leadership should be viewed not merely as a positional authority but as a relational and dynamic process that enables collaboration and innovation.

Another important implication relates to the institutionalization of innovation. The findings suggest that innovation efforts often remain fragmented and dependent on individual actors, which limits their sustainability. To address this issue, institutions should develop formal mechanisms and structures that support continuous innovation, such as dedicated innovation units, professional development programs, and systematic evaluation processes. By embedding innovation into the institutional fabric, organizations can ensure that sustainability initiatives are not only initiated but also sustained over time.

5.6.3 Policy Implications

At the policy level, this study underscores the importance of aligning national and institutional efforts to achieve sustainability in education. One of the key challenges identified in the findings is the gap between policy formulation and implementation. While many governments

have adopted policies that promote sustainability and ESD, these policies are often not effectively translated into practice at the institutional level. This suggests the need for more coherent and coordinated policy frameworks that provide clear guidance, adequate resources, and consistent support for educational institutions.

In addition, policymakers should consider the diverse contextual conditions faced by institutions, particularly in developing countries. Standardized policy approaches may not be effective in environments characterized by resource constraints and structural limitations. Therefore, policies should be flexible and adaptive, allowing institutions to tailor sustainability strategies to their specific contexts. This includes providing financial support, capacity-building programs, and incentives for innovation.

Moreover, the study highlights the importance of creating enabling environments that foster collaboration between different stakeholders, including government agencies, educational institutions, and local communities. Such collaboration is essential for addressing the complex and multidimensional challenges associated with sustainability. By promoting partnerships and knowledge-sharing, policymakers can enhance the overall effectiveness of ESD initiatives and contribute to the development of more resilient and sustainable education systems.

6. Conclusion

This study set out to examine how strategic leadership, institutional innovation, and external environmental factors interact in shaping the implementation of Education for Sustainable Development within a developing country context. The findings reveal that while there is a growing recognition of sustainability as a strategic priority, its implementation remains largely fragmented, programmatic, and insufficiently institutionalized. This condition reflects a broader "implementation gap" between global sustainability frameworks and local educational practices.

A key contribution of this study is the identification of a **"transitional sustainability model"**, which characterizes institutions that are in the process of moving toward sustainability but have not yet achieved systemic transformation. Within this model, elements of strategic leadership and institutional innovation are present but remain only partially integrated. Leadership tends to be adaptive yet centralized, limiting stakeholder participation and long-term institutionalization. Similarly, innovation is evident but largely incremental, lacking the coherence and scale necessary to drive transformative change.

The study further demonstrates that sustainability transformation is not solely determined by internal institutional dynamics but is significantly shaped by external environmental conditions. By incorporating PESTEL Analysis, the research highlights how political, economic, social, technological, environmental, and legal factors create both opportunities and constraints for ESD implementation. This underscores the importance of aligning internal strategies with external contexts to achieve meaningful and sustainable outcomes.

Importantly, this study advances the literature by proposing an integrated framework that links strategic leadership, institutional innovation, and ESD within a dynamic environmental context. The concept of a **"leadership–innovation–ESD nexus"** provides a novel analytical lens for understanding how these elements interact to produce sustainability outcomes. This integrative approach moves beyond fragmented analyses and offers a more holistic perspective on sustainable education systems.

From a practical standpoint, the findings suggest that educational institutions need to adopt a whole-institution approach, promote distributed leadership, and institutionalize innovation processes to achieve sustainability transformation. At the policy level, there is a need for more coherent and context-sensitive frameworks that bridge the gap between policy and practice.

Despite its contributions, this study is not without limitations. The reliance on a single case study and secondary data may limit the generalizability of the findings. Future research is therefore encouraged to employ comparative and mixed-method approaches to further validate and extend the proposed framework.

In conclusion, this study highlights that achieving sustainable education systems requires not only incremental improvements but also systemic transformation driven by the alignment of leadership, innovation, and environmental conditions. Such transformation is inherently complex and iterative, requiring sustained commitment and adaptive strategies across multiple levels of the education system.

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