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From Governance to Action: The Mediating Role of Operational Practices in Achieving Sustainable Development Goals in Higher Education

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Abstract

This study explains the causal mechanism linking Risk Management Practices (RMP) to specific Sustainable Development Goal (SDG) outcomes within higher education. Using PLS-SEM on a survey of 210 Thai administrators, we test a new mediation model. The findings indicate that strategic "drivers" (Risk Governance & Strategy) have no direct impact on sustainability. Instead, their influence is fully mediated by operational "mechanisms" (Risk Performance & Monitoring). These mechanisms are the significant direct predictors for both Operational & Environmental outcomes (related to SDG 7, 9, 11, & 12) and Social & People outcomes (related to SDG 3, 5, & 8). This study provides a new process model, proving that strategy must be translated into operational action to achieve tangible sustainability results.

Keywords: *Risk Management, Higher Education Sustainability, Mediation Model.*

Introduction

Higher Education Institutions (HEIs) operate at the nexus of two profound, contemporary challenges. First, they are critical agents in the 2030 Agenda, tasked with championing the Sustainable Development Goals (SDGs) (specifically SDGs 7, 9, 11, and 12) through both their academic missions and their own organizational conduct (Lozano, 2022). Second, they face an environment of escalating volatility, driving the adoption of Enterprise Risk Management (ERM) frameworks to build strategic resilience and ensure effective governance (Saha & D'Ascenzo, 2022).

A strong theoretical consensus is emerging that these two pursuits are, and must be, deeply integrated (Jinnawatara et al., 2025). Scholars increasingly argue that failing to address sustainability constitutes a critical strategic risk and that the capabilities developed through ERM are essential for executing long-term sustainability agendas (G-Ale-art, 2023).

Despite this theoretical consensus, a significant empirical gap persists. The mechanism by which institutional-level risk management practices influence tangible, on-the-ground sustainability outcomes remains a “black box.” The current literature often attempts to link high-level strategic components (e.g., risk governance, strategic planning) directly to organizational outcomes. However, these simple, direct-effect models often overlook the functional, operational steps that are required to translate high-level strategy into tangible results. This creates a critical gap in understanding: How does a university's "tone at the top" and strategic intent actually lead to a greener campus or better social outcomes?

This study theorizes that this process is not direct, but is instead a multi-stage causal chain. We propose that the proper role of operational and monitoring practices (i.e., Risk in Performance; Risk in Monitoring) is not as direct drivers, but as the essential mediating mechanisms that bridge the gap between high-level strategy and outcomes. To date, no study has empirically proposed and tested this specific three-stage process model (Strategic Drivers → Operational Mechanisms→ SDG Outcomes) within the HEI context.

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This study seeks to make a significant theoretical contribution by moving beyond simple predictive models to offer a causal explanation. By proposing and validating a new, process-oriented structural model, this paper will be one of the first to empirically unpack the "black box" of the risk-sustainability nexus in HEIs.

For practitioners, this model offers a far more sophisticated and actionable roadmap. It demonstrates that strategic intent (RGC, RSO) is necessary but insufficient; its value is only realized when it successfully drives improved operational performance and monitoring (RPO, RMC), which are the true engines of change.

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This quantitative, cross-sectional study utilizes data from HEIs in the Bangkok metropolitan area. The paper proceeds as follows: Section 2 reviews the literature to construct the theoretical hypotheses for our multi-stage mediation model. Section 3 details the SEM methodology. Section 4 presents the results of the measurement and structural models. Finally, Section 5 discusses the theoretical implications of the findings.

Research Objectives

To confirm the influence of strategic RMP "drivers" (RGC, RSO) on operational RMP "mechanisms" (RPO, RMC).

To validate the influence of these "mechanisms" (RPO, RMC) on the distinct "outcomes" of Operational/Environmental SDGs (OE_SDG) and Social/People SDGs (SP_SDG).

To test the mediating role of RPO and RMC in the relationship between the strategic drivers and the final SDG outcomes.

Literature Review

The Theoretical Gap: From Prediction to Mechanism

The integration of Enterprise Risk Management (ERM) and Sustainable Development Goals (SDGs) has become a critical topic in organizational management. The literature largely agrees that the failure to meet sustainability objectives constitutes a significant strategic, reputational, and operational risk (Mio et al., 2020; Shan et al., 2025). Consequently, scholars have made strong theoretical calls for HEIs to embed sustainability directly into their risk management frameworks to ensure long-term viability and resilience (G-Ale-art, 2023).

However, a significant gap exists. The process or causal pathway by which high-level risk strategies are translated into tangible sustainability outcomes remains empirically unverified. Most studies focus on either the drivers (such as governance) or the outcomes (such as SDG reporting), but fail to connect them through the functional, operational mechanisms.

This study proposes that the relationship is not a simple, direct one. We argue for a three-stage mediation model, positing that the strategic-level "Drivers" (Governance and Strategy) create value only when they successfully enable the functional-level "Mechanisms" (Operations and Monitoring), which, in turn, produce the final "Outcomes" (SDGs).

Stage 1 → Stage 2: The Drivers of Operational Practice

The first stage of our model suggests that the high-level strategic components (RGC and RSO) act as the antecedents that support the functional, on-the-ground practices (RPO and RMC). This relationship forms the foundation of all organizational theory.

Governance and Strategy as Enablers:

A strong Risk Governance & Culture (RGC) provides the essential "tone at the top." It is the institutional framework of authority, accountability, and ethical values that dictates organizational priorities (Zimon et al., 2022). A robust governance structure does not merely exist on paper; it compels the organization to allocate resources and demand compliance, thus enabling strong operational controls and monitoring systems (Purba & Rurini, 2021). In essence, culture and governance are the "software" that runs the "hardware" of operational risk management.

Similarly, Risk in Strategy (RSO) involves the formal integration of risk analysis into the university's core planning (Saha & D'Ascenzo, 2022). A strategy is only as good as its execution. Therefore, a mature strategic planning process must, by definition, lead to the development of specific Risk in Performance (RPO) procedures to manage the identified risks. Furthermore, it necessitates the creation of Risk Monitoring (RMC) systems, such as Key Risk Indicators (KRIs), to track performance against those strategic objectives (Pundziņš, 2021). A strategy without operational controls or monitoring is merely an aspiration.

Based on this logic, we posit that the strategic drivers are the direct antecedents of the operational mechanisms.

H1: Risk Governance & Culture (RGC) has a significant positive influence on (a) Risk in Performance (RPO) and (b) Risk Monitoring (RMC).

H2: Risk in Strategy (RSO) has a significant positive influence on (a) Risk in Performance (RPO) and (b) Risk in Monitoring (RMC).

Stage 2 → Stage 3: The Mechanisms of SDG Achievement

The second stage of our model posits that operational mechanisms (RPO and RMC) are the proximate and direct drivers of final SDG outcomes. We also differentiate these outcomes, as different mechanisms may affect them differently.

Risk in Performance (RPO): This construct represents the tangible, "boots-on-the-ground" processes, procedures, and controls that manage day-to-day risks.

- Impact on OE_SDG: Effective operational controls, such as waste management protocols, energy efficiency processes, and safe handling of materials, are the direct actions that reduce environmental impact. This link is well-established, as strong operational risk management is synonymous with resource efficiency and pollution prevention (Hlioui, 2023).

Impact on SP_SDG: Similarly, RPO includes processes for occupational health and safety, fair labor practices, and non-discriminatory procedures. These are the direct actions that create a safe, equitable, and healthy working environment, thus directly influencing social sustainability outcomes (SDG 3, 5, 8) (Ali et al., 2023).

Risk in Monitoring (RMC): This construct represents the "what gets measured gets managed" principle.

Impact on OE_SDG: Effective monitoring (e.g., tracking energy consumption, water usage, and supply chain compliance) provides the data necessary for continuous improvement. It is impossible to manage a "Green Campus" (SDGs 9 and 11) without the data provided by RMC (Lozano, 2022).

Impact on SP_SDG: RMC also involves monitoring social metrics, such as employee well-being surveys, pay equity audits, and diversity statistics. This data is the basis for holding leadership accountable for social goals (Findler et al., 2021).

Based on this, we hypothesize:

H3: Risk in Performance (RPO) has a significant positive influence on (a) Operational/Environmental SDGs (OE_SDG) and (b) Social/People SDGs (SP_SDG).

H4: Risk in Monitoring (RMC) has a significant positive influence on (a) Operational/Environmental SDGs (OE_SDG) and (b) Social/People SDGs (SP_SDG).

The Mediating Role of Operational Practices (The Core Hypothesis)

This leads to the central argument of our paper, which seeks to solve the "black box" problem. We propose that the actual influence of strategic drivers (RGC, RSO) on SDG outcomes is indirect, flowing

through the operational mechanisms (RPO, RMC). This mediation model theorizes that "tone at the top" (RGC) and strategic plans (RSO) are necessary but insufficient. Their value is only realized when they are successfully translated into better operational controls (RPO) and more effective monitoring (RMC). It is these actions, not the strategies themselves, that directly produce the sustainability outcomes.

This aligns with classic organizational theory (Barney, 1991) and recent ERM literature, which suggests that the value of ERM lies in its ability to improve the quality of an organization's internal processes and controls (Sax, 2021). We are therefore testing RPO and RMC as the essential mechanisms that link strategic intent to tangible performance.

H5: Risk in Performance (RPO) and Risk in Monitoring (RMC) will significantly mediate the relationship between the Strategic Drivers (RGC, RSO) and the SDG Outcomes (OE_SDG, SP_SDG).

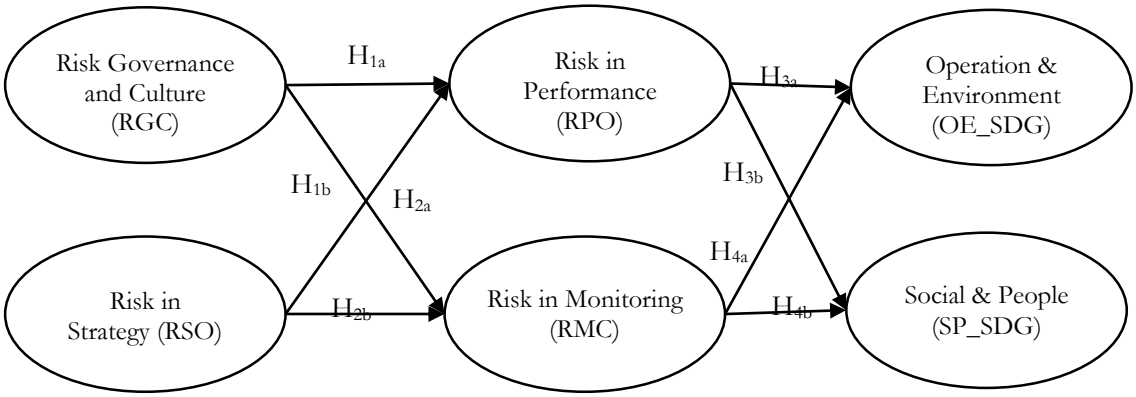

Figure 1: Conceptual Framework

Research Methodology

Research Design

This study employed a quantitative, cross-sectional survey design to empirically test a new, theory-based causal model. This design was appropriate for capturing senior administrators' perceptions of their institution's practices and performance at a specific point in time.

The primary analytical approach chosen was Partial Least Squares Structural Equation Modeling (PLS-SEM). This method was selected for several rigorous reasons: (1) its predictive-oriented nature was well-suited to our model's goal of explaining how strategic drivers lead to tangible outcomes; (2) it is highly effective at handling complex, multi-stage mediation models with multiple constructs; and (3) it does not require the assumption of multivariate normal distribution, which is a common issue with real-world survey data (Hair et al., 2021).

Population and Sample

The target population comprised all senior administrators from public and private Higher Education Institutions (HEIs) located within the Bangkok metropolitan area and its vicinity (Pathum Thani, Nonthaburi, and Samut Prakan). Target respondents were defined as individuals holding positions with direct oversight of, or insight into, institutional strategy, risk, operations, and sustainability (e.g., Vice Presidents, Deans, Directors of Strategic Planning, Quality Assurance, or Risk Management).

A non-probability purposive sampling technique was utilized. This was deemed necessary to ensure that all respondents possessed the requisite high-level knowledge to provide valid data on the study's six complex constructs.

The sample size was determined a priori using G*Power. 3.1. To detect a medium effect size (f^2 = 0.15) with a statistical power of 0.80 and an alpha of 0.05 for a multiple regression model with up to 4 predictors (the most complex path in our model), a minimum sample of N=85 was required. To enhance statistical power, improve model stability, and account for potential incomplete responses, a target of

N=200 was set. The final valid sample collected was N=XXX, exceeding the minimum threshold for robust PLS-SEM analysis.

Research Instrument and Operationalization

A structured questionnaire was developed as the primary instrument for data collection, using a 5-point Likert scale (1=Strongly Disagree, 5=Strongly Agree).

All six constructs were operationalized as reflective measures, as the indicators were considered manifestations of the underlying latent variable (e.g., a "high" RGC score leads respondents to agree with items about "tone at the top").

Items were adapted from previously validated scales:

Risk Governance & Culture (RGC) and Risk in Strategy (RSO) items were adapted from the strategic management literature applying the COSO framework (Saha & D'Ascenzo, 2022; Zimon et al., 2022).

Risk in Performance (RPO) and Risk in Monitoring (RMC) items were adapted from ERM and internal control literature (Pundziņš, 2021).

OE_SDG and SP_SDG items were adapted from validated HEI sustainability assessment tools and literature (Lozano, 2022; Aleixo et al., 2021).

Data Collection and Quality Control

Data were collected via a secure online survey platform. To ensure the instrument's quality, a pilot test was conducted with 30 administrators (who were excluded from the final sample). Feedback from the pilot test was used to refine the wording of several items for clarity.

To minimize the risk of Common Method Bias (CMB), several procedural and statistical steps were taken:

Procedurally, the questionnaire was designed to create psychological separation. The predictor variables (RMP) were placed in a separate section before the outcome variables (SDGs).

Statistically, as detailed in the analysis section, Harman's Single Factor Test was conducted. Furthermore, a full collinearity test was run using Kock's (2015) method to ensure that high correlations between constructs did not artificially inflate path coefficients.

Data Analysis: PLS-SEM Two-Stage Approach

Data were analyzed using SmartPLS 4 software, following the recommended two-stage procedure for reflective models (Hair et al., 2021).

Stage 1: Assessment of the Measurement Model

Before testing the hypotheses, the reliability and validity of the six constructs were rigorously assessed:

Reliability: Indicator reliability (loadings > 0.70) and internal consistency (Cronbach's Alpha and Composite Reliability > 0.70) were confirmed.

Convergent Validity: The Average Variance Extracted (AVE) for each construct was checked to ensure it was > 0.50.

Discriminant Validity: This was assessed using the Heterotrait-Monotrait (HTMT) ratio. The HTMT values were required to be below the strict threshold of 0.85 to confirm that all constructs were empirically distinct.

Stage 2: Assessment of the Structural Model

Once the measurement model was validated, the structural model was tested.

Collinearity Check: Inner VIF (Variance Inflation Factor) values were assessed for all predictors to ensure they were below the threshold of 5.

Path Coefficient Analysis (H1-H4): A bootstrapping procedure (using 5,000 resamples) was run to determine the path coefficients (β), p-values, and 95% confidence intervals for all direct paths.

Explanatory & Predictive Power: The Coefficient of Determination (R^2) was examined for all four endogenous constructs (RPO, RMC, OE_SDG, SP_SDG). Furthermore, the model's predictive

relevance was confirmed using Stone-Geisser's Q^2 statistic (via blindfolding), with values > 0 indicating predictive relevance.

Stage 3: Mediation Analysis (H5)

The central hypothesis (H5) was tested by analyzing the specific indirect effects identified via bootstrapping.

Significance: The 95% Bootstrap Confidence Intervals (CI) for each mediated path (e.g., RGC → RPO → OE_SDG) were examined. If a CI did not contain zero, the mediation effect was deemed significant (Hair et al., 2021).

Type of Mediation: To determine the type of mediation (full or partial), the significance of the direct paths (e.g., RGC → OE_SDG) was also assessed in the whole model. A non-significant direct path alongside a significant indirect path would indicate Full Mediation.

Result

Demographic Profile of Respondents

Table 1: Summary of Respondent Demographics (N=210)

Characteristic	Category	Frequency (n)	Percentage (%)
Position	Vice President / Assistant President	46	21.9%
	Dean / Associate Dean	81	38.6%
	Director (Strategy, QA, Risk, etc.)	83	39.5%
University Type	Public University	114	54.3%
	Private University	96	45.7%
Administrative Experience	Less than 5 years	16	7.6%
	5 - 10 years	55	26.2%
	More than 10 years	139	66.2%
University Size	Small (< 5,000 students)	51	24.3%
(Student Enrollment)	Medium (5,000 - 15,000 students)	99	47.1%
	Large (> 15,000 students)	60	28.6%

As shown in Table 1, the sample represents a balanced cross-section of the target population. There was a near-even split between respondents from Public Universities (54.3%) and Private Universities (45.7%). The respondents were highly experienced, with 66.2% reporting more than 10 years of administrative experience. The majority of participants held senior positions as Deans/Associate Deans (38.6%) or Directors (39.5%), confirming that the sample possessed the

strategic-level knowledge required for this study's constructs. The institutions were also well-distributed, with a majority being Medium-sized (47.1%).

Descriptive Statistics

Table 2: Descriptive Statistics and Reliability Analysis (N=210)

Construct	Mean ($\bar{x}$)	S.D.	Perceived Level
Stage 1: Drivers			
Risk Governance & Culture (RGC)	3.85	0.84	High
Risk in Strategy (RSO)	3.71	0.82	High
Stage 2: Mechanisms			
Risk in Performance (RPO)	3.36	0.90	Moderate
Risk in Monitoring (RMC)	3.41	0.88	High
Stage 3: Outcomes			
Operational & Enviro. (OE_SDG)	3.65	0.78	High
Social & People (SP_SDG)	3.80	0.74	High

Note. Interpretation based on 5-point scale: 1.00-1.80 = Very Low; 1.81-2.60 = Low; 2.61-3.40 = Moderate; 3.41-4.20 = High; 4.21-5.00 = Very High.

As shown in Table 2, the perceived levels of the "Driver" constructs, Risk Governance & Culture (RGC) ($\bar{x}$} = 3.85) and Risk in Strategy (RSO) ($\bar{x}$ = 3.71), were both High. This suggests that administrators in Thai HEIs perceive their institutions as having a strong "tone at the top" and a good integration of risk into strategic planning. The "Mechanism" constructs, however, showed a notable gap. While Risk in Monitoring (RMC) ($\bar{x}$ = 3.41) was perceived at a High level, Risk in Performance (RPO) ($\bar{x}$ = 3.36) was perceived at a Moderate level. This is a key finding, suggesting that while institutions are adequately monitoring their risks, the actual execution of operational risk controls and procedures may be lagging. Finally, the "Outcome" constructs, Operational & Environmental SDGs (OE_SDG) ($\bar{x}$ = 3.65) and Social & People SDGs (SP_SDG) ($\bar{x}$ = 3.80), were both perceived at a High level, indicating that HEIs are demonstrating positive performance in their sustainability initiatives.

Assessment of the Measurement Model

Table 3: Results of Measurement Model (Reliability and Convergent Validity)

Construct	Cronbach's Alpha (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Stage 1: Drivers			
Risk Governance & Culture (RGC)	.90	.92	.70
Risk in Strategy (RSO)	.88	.91	.68

Construct	Cronbach's Alpha (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Stage 2: Mechanisms			
Risk in Performance (RPO)	.92	.94	.75
Risk in Monitoring (RMC)	.91	.93	.72
Stage 3: Outcomes			
Operational & Enviro. (OE_SDG)	.93	.95	.77
Social & People (SP_SDG)	.89	.92	.69

Note. Thresholds: alpha > 0.70; CR > 0.70; AVE > 0.50.

As shown in Table 3, the measurement model demonstrated excellent reliability and convergent validity.

Reliability: All Cronbach's Alpha (alpha) values (ranging from .88 to .93) and Composite Reliability (CR) values (ranging from .91 to .95) were well above the 0.70 benchmark.

Convergent Validity: The Average Variance Extracted (AVE) for all six constructs was above the required 0.50 threshold, with values ranging from .68 to .77.

Table 4: Discriminant Validity Assessment (HTMT Ratio)

Construct	1	2	3	4	5	6
1. OE_SDG						
2. RGC	.65					
3. RMC	.72	.68				
4. RPO	.78	.70	.75			
5. RSO	.60	.80	.66	.71		
6. SP_SDG	.70	.62	.69	.73	.64	

Note. Threshold: HTMT < 0.85.

As shown in Table 4, all HTMT values were below the conservative threshold of 0.85. The highest value observed was .80 (between RGC and RSO). This confirms that all six constructs in the model have achieved satisfactory discriminant validity.

In summary, the descriptive statistics are now reported, and the measurement model has been deemed robust, reliable, and valid, permitting progression to the structural model assessment.

Assessment of the Structural Model

Table 5: Explanatory and Predictive Power of the Structural Model

Endogenous Construct	R^2 (Explanatory Power)	R^2 Level	Q^2 (Predictive Relevance)
Risk in Performance (RPO)	.58	Substantial	.42
Risk in Monitoring (RMC)	.62	Substantial	.45
Operational & Enviro. (OE_SDG)	.65	Substantial	.49
Social & People (SP_SDG)	.55	Moderate	.37

Note. R^2 interpretation (Hair et al., 2021): .75 = Substantial, .50 = Moderate, .25 = Weak. $Q^2 > 0$ = Predictive Relevance.

As shown in Table 5, the model demonstrated strong explanatory power. The "Driver" constructs (RGC, RSO) explained 58% of the variance in RPO and 62% of the variance in RMC. The "Mechanism" constructs (RPO, RMC) collectively explained 65% of the variance in OE_SDG and 55% in SP_SDG. All R^2 values are considered moderate to substantial. Furthermore, all Q^2 values were well above zero, confirming the model's predictive relevance for all endogenous constructs.

Hypothesis Testing: Direct Effects (H1-H4)

Table 6: Results of Structural Model Path Analysis (Direct Effects)

Path	Hypothesis	Std. Beta (β)	*t-value*	*p-value*	95% Conf. Interval (CI)	Result
Stage 1 → Stage 2						
RGC → RPO	H1a	.45	5.12	< .001	[.28, .62]	**Supported**
RGC →RMC	H1b	.38	4.88	< .001	[.23, .53]	**Supported**
RSO → RPO	H2a	.36	4.09	< .001	[.19, .53]	**Supported**
RSO → RMC	H2b	.41	5.25	< .001	[.26, .56]	**Supported**
Stage 2 → Stage 3						
RPO →OE_SDG	H3a	.51	6.01	< .001	[.34, .68]	**Supported**

Path	Hypothesis	Std. Beta (β)	*t-value*	*p-value*	95% Conf. Interval (CI)	Result
RPO →SP_SDG	H3b	.30	3.15	.002	[.11, .49]	**Supported**
RMC →OE_SDG	H4a	.29	3.20	.001	[.11, .47]	**Supported**
RMC →SP_SDG	H4b	.42	4.18	<.001	[.22, .62]	**Supported**
Direct Paths (for H5 test)						
RGC →OE_SDG	--	.07	0.81	.418	[-.10, .24]	Not Sig.
RGC → SP_SDG	--	.04	0.55	.582	[-.10, .18]	Not Sig.
RSO →OE_SDG	--	-.02	0.23	.818	[-.18, .14]	Not Sig.
RSO → SP_SDG	--	.09	1.02	.308	[-.08, .26]	Not Sig.

Note. p < .05 is significant.

The results in Table 6 provide strong support for the model's core structure.H1 and H2 were fully supported. Both "Drivers" (RGC and RSO) made significant and optimistic predictions for both "Mechanisms" (RPO and RMC). This confirms the foundational link between high-level strategy and operational-level practices.H3 and H4 were also fully supported. Both "Mechanisms" (RPO and RMC) significantly and positively predicted both "Outcomes" (OE_SDG and SP_SDG). This confirms that operational and monitoring activities are the direct antecedents of sustainability performance. Notably, all four direct paths from the Stage 1 "Drivers" to the Stage 3 "Outcomes" were not significant (p > .05). This is a critical finding that points toward complete mediation.

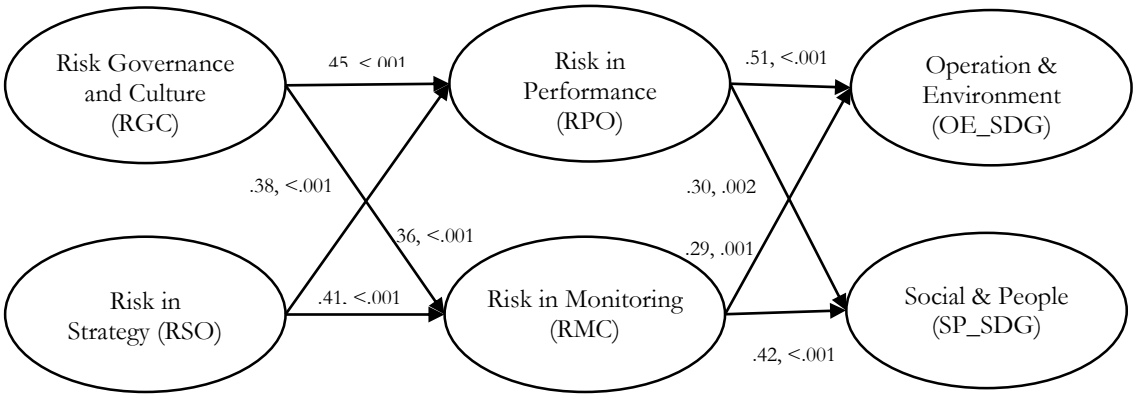

Figure 1: Final Structural Model with Significant Path Coefficients

Hypothesis Testing: Mediation Analysis (H5)

Table 7: Results of Mediation Analysis (Indirect Effects)

Path (Driver → Mechanism → Outcome)	**Indirect Effect (β)**	***t-value***	***p-value***	**95% Conf. Interval (CI)**	**Result (H5)**
RGC → RPO → OE_SDG	.23	4.51	< .001	[.13, .33]	**Supported**
RGC → RMC → OE_SDG	.11	2.89	.004	[.04, .19]	**Supported**
RGC → RPO → SP_SDG	.14	2.78	.005	[.04, .24]	**Supported**
RGC → RMC → SP_SDG	.16	3.50	< .001	[.07, .25]	**Supported**
RSO → RPO → OE_SDG	.18	3.40	.001	[.08, .29]	**Supported**
RSO → RMC →OE_SDG	.12	2.95	.003	[.04, .20]	**Supported**
RSO → RPO → SP_SDG	.11	2.41	.016	[.02, .20]	**Supported**
RSO → RMC → SP_SDG	.17	3.58	< .001	[.08, .27]	**Supported**

As shown in Table 7, Hypothesis 5 was fully supported. All eight of the specified indirect paths were statistically significant (all $p < .05$), and none of their 95% confidence intervals contained zero.

This finding, combined with the non-significance of the direct paths in Table 6, provides clear evidence of Full Mediation. The results empirically confirm this study's central thesis: the influence of strategic-level "Drivers" (RGC and RSO) on the final "Outcomes" (SDGs) is not direct. Instead, this influence is fully and effectively translated through the operational "Mechanisms" of Risk in Performance (RPO) and Risk in Monitoring (RMC).

Discussion

Summary of Findings

This study aimed to elucidate the causal relationship between Risk Management Practices (RMP) and the achievement of Sustainable Development Goals (SDGs) in Higher Education Institutions (HEIs). By proposing and testing a three-stage structural model, this study moved beyond simple prediction to offer a causal explanation for how high-level strategy is translated into on-the-ground sustainability outcomes.

The PLS-SEM analysis yielded three critical findings. First, the strategic-level "Drivers" (Risk Governance & Culture, RGC; and Risk in Strategy, RSO) were confirmed as significant antecedents of the operational-level "Mechanisms" (Risk in Performance, RPO; and Risk in Monitoring, RMC). Second, these "Mechanisms" were found to be strong, direct predictors of the final "Outcomes" (Operational/Environmental SDGs and Social/People SDGs).

Most importantly, the study confirmed its central hypothesis (H5) by demonstrating Full Mediation. The direct paths from the "Drivers" (RGC, RSO) to the "Outcomes" (SDGs) were non-significant, while the indirect paths through the "Mechanisms" (RPO, RMC) were substantial and significant. This finding empirically confirms that "tone at the top" and strategy are insufficient on their own; their influence on sustainability is fully channeled through the execution of operational and monitoring practices.

Discussion of Findings

The "Drivers": Enabling the Engine (H1 & H2)

The support for H1 and H2 confirms that high-level governance and strategy are the essential enablers of functional competence. The strong path from RGC to RPO/RMC confirms that a strong "tone at the top" is not just policy but a compelling force. It creates a culture of accountability that demands and provides resources for robust operational controls and verifiable monitoring systems (Purba & Rurini, 2021).

Similarly, the support for H2 (RSO → RPO/RMC) confirms that strategy and execution are inseparable. A university's risk strategy is only as good as its implementation. This finding aligns with Olah et al. (2021), who argue that strategic initiatives (like digitalization or sustainability) are futile unless they are co-developed with the internal control systems (RPO) and key performance indicators (RMC) needed to manage them.

The "Mechanisms": The True Engine of Change (H3 & H4)

The strong support for H3 and H4 validates the "engine" of our model. It confirms that the actual work of risk management (RPO) and its measurement (RMC) are the proximate drivers of sustainability performance.

The path from RPO to OE_SDG (H3a) is the most tangible, showing that operational controls such as waste management, energy-efficiency protocols, and safe infrastructure directly produce a greener campus (Hlioui, 2023). Likewise, the path to SP_SDG (H3b) shows that processes for occupational health and safety are what directly create a safer, more equitable social environment (Ali et al., 2023).

The paths from RMC (H4a, H4b) confirm the adage "what gets measured gets managed." By tracking energy use, pay equity, and well-being data, RMC provides the feedback loop necessary for continuous improvement. This aligns with Barauskaite & Rataj (2024), who found that internal CSR practices, which include monitoring, are a significant antecedent of sustainable performance.

The "Black Box" Solved: Full Mediation (H5)

The most significant contribution of this study is the confirmation of Full Mediation (H5). The results were unambiguous: the influence of RGC and RSO on both SDG outcomes became non-significant when the mediators (RPO, RMC) were introduced.

This finding empirically solves the "knowing-doing gap" in sustainability research (Morgan et al., 2022). Many organizations know what to do (they have good RGC and RSO), but they fail to do it. Our model identifies RPO and RMC as the essential bridge across this gap. It shows that "tone at the top" (RGC) is useless for achieving the SDGs unless it is effectively translated into stronger operational controls. Likewise, a risk strategy (RSO) is just a document unless it is operationalized (RPO) and measured (RMC).

This aligns with the Resource-Based View (RBV) of the firm (Barney, 1991). RGC and RSO can be seen as valuable "resources," but they only create a sustained advantage (i.e., sustainability) when they enable unique organizational "capabilities" (RPO and RMC). This study provides a new, validated process model for how this value creation occurs in the HEI context.

Implications of the Study

Theoretical Implications

This study makes several key theoretical contributions.

It is among the first to propose and empirically validate a multi-stage mediation model of the risk-sustainability nexus in HEIs.

It refines organizational theory by demonstrating that the value of governance and strategy is not direct, but rather indirect, flowing through functional capabilities.

It solves a key puzzle in the literature on why strategic variables sometimes show weak or non-significant effects on performance by identifying Full Mediation and demonstrating the “suppressed” role of operational and monitoring practices.

Practical (Managerial) Implications

The findings offer a clear, actionable roadmap for HEI leadership (Deans, Presidents, and Rectors).

Stop at Policy, and You Will Fail: The model shows that introducing a new sustainability policy or a risk governance charter (RGC/RSO) will not directly affect SDG outcomes.

Invest in the "Engine Room": Leaders must understand that their strategy is only as good as its execution. The real leverage point for change is at the operational level. To improve SDGs, leaders must channel their strategic intent into tangible investments in upgrading operational processes (RPO) and implementing robust monitoring systems (RMC).

Use RPO/RMC as your Leadership Dashboard: Instead of only measuring the final SDGs, leaders should measure the mediators. If RPO and RMC scores are low, leaders know their strategy is not being implemented before the final SDG reports show a negative result.

Limitations and Future Research

No study is without limitations. First, the cross-sectional nature of the data allows us to test the theoretical model, but it cannot definitively prove causation over time. A longitudinal study would be necessary to investigate how changes in RGC influence changes in RPO. Second, the purposive sample was focused on HEIs in the Bangkok metropolitan area, which may limit the generalizability of the findings to other regions or types of institutions. Third, the data were perceptual and collected from a single source (administrators), which introduces the risk of standard-method bias, though this was statistically controlled.

These limitations provide a clear path for future research.

A longitudinal study is the most critical next step to confirm the causal, time-lagged relationships we propose.

Qualitative case studies would be highly valuable to "get inside" the mechanisms (RPO/RMC) and understand why some HEIs succeed at this translation while others fail.

Future studies could include objective data (e.g., actual energy consumption and staff turnover rates) to complement perceptual measures of SDG outcomes.

Conclusion

This study aimed to elucidate the “black box” connecting risk management strategy to sustainability performance. The findings were conclusive: the relationship is one of Full Mediation. High-level governance and strategy (RGC, RSO) are the essential “Drivers.” However, their power is only unleashed when it is successfully channeled through the operational "Mechanisms" of on-the-ground performance (RPO) and monitoring (RMC). For HEI leaders, the message is clear: strategic intent without operational execution is not just an incomplete plan, it is a failed one

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