



## The Impact of Sustainable Leadership on Adopting a Green Strategy through Organizational Learning An Exploratory Study in Higher Education Institutions in the Kurdistan Region

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### Abstract

This research paper seeks to determine the purpose of this study which is to examine the role of organizational learning: Sustainable Leadership and Adoption of Green Strategy in Higher Education Institutions. Sustainable Leadership the independent variable against three dimensions (Visionary Thinking, Ethical Behavior, Stakeholder Engagement), and Green Strategy as the dependent variable against four dimensions (Waste Reduction, Energy Use Policy, Green Curriculum, Sustainability Reporting), and Organizational Learning as the Moderating Variable against three dimensions (Knowledge Acquisition, Knowledge Sharing, Adaptability) which is directly influencing Higher Education Institutions in the Kurdistan Region - Iraq. The researcher relied on the descriptive analytical approach by collecting and studying the perspectives of a sample, where the variables were investigated and the correlation and influence among the variables were tested. The represented universities and institutions where the study sample is located (883) respondents out of the total (63,800) sample individuals are used as the study field (Students, Administrative staff, Academic staff) . The hypotheses were analyzed by using the computer program (SPSS V.24) statistically. A set of key findings made in the study was that Sustainable leadership does not only have a direct and significantly positive impact on the adoption of a green strategy but also through the mediating effect of organizational learning. The research suggested some recommendations Organized and repeat mechanisms and programs should be implemented to promote collective and collaborative learning about green best practices and exchange of knowledge between colleges and departments.

**Keywords:** *Leadership, Sustainable Leadership, Green Strategy, Higher Education Institutions, Organizational Learning.*



## تأثير القيادة المستدامة في تبني الاستراتيجية الخضراء بتوسط التعلم التنظيمي

### دراسة استطلاعية في مؤسسات التعليم العالي بإقليم كردستان

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#### المستخلص

تهدف هذه الدراسة إلى تقييم دور التعلم التنظيمي: القيادة المستدامة وتبني الاستراتيجيات الخضراء في مؤسسات التعليم العالي. تُمثل القيادة المستدامة متغيرًا مستقلًا من خلال ثلاثة أبعاد (التفكير الاستراتيجي، السلوك الأخلاقي، إشراك أصحاب المصلحة)، وتُمثل الاستراتيجية الخضراء متغيرًا تابعًا من خلال أربعة أبعاد (تقليل النفايات، سياسة استخدام الطاقة، المناهج الخضراء، إعداد تقارير الاستدامة)، ويُمثل التعلم التنظيمي متغيرًا وسيطًا من خلال ثلاثة أبعاد (اكتساب المعرفة، مشاركة المعرفة، القدرة على التكيف)، مما يؤثر بشكل مباشر على مؤسسات التعليم العالي في إقليم كردستان العراق. اعتمدت الدراسة على المنهج الوصفي التحليلي من خلال جمع وتحليل آراء عينة من المبحوثين، حيث تم وصف المتغيرات وتحليل العلاقات والتأثيرات بينها. يمثل مجال الدراسة الجامعات والمؤسسات، وتتكون عينة الدراسة من (883) مستجيب من إجمالي (63800) أفراد العينة من (الطلاب/ الطالبات، الإداريين، التدريسين). تم اختبار الفرضيات بتطبيق الأساليب الإحصائية باستخدام برنامج الحاسوب (SPSS V.24) توصلت الدراسة إلى مجموعة من الاستنتاجات الرئيسية، منها أن القيادة المستدامة لا تؤثر بشكل مباشر وهام على استخدام الاستراتيجية الخضراء فحسب، بل تعمل أيضًا بشكل غير مباشر من خلال التعلم التنظيمي، والذي يتوسط جزئيًا العلاقة. أوصت الدراسة بمجموعة من التوصيات، منها ضرورة إنشاء آليات وبرامج منظمة ومستمرة لتشجيع التعلم الجماعي والتعاوني حول أفضل الممارسات الخضراء وتبادل المعرفة بين الكليات والأقسام.

**الكلمات المفتاحية:** القيادة، القيادة المستدامة، الاستراتيجية الخضراء، مؤسسات التعليم العالي، التعلم التنظيمي.



## 1. INTRODUCTION

The escalation of environment, societal, and economic threats is leading to a radical shift of the world towards sustainability. This imposes an increasingly heavy burden on institutions of any kind since they must adopt green and sustainable practices. Institutions of higher learning (HEIs) take center stage as an influential player, as consumers and as users of resources and as a waste and polluters, yet as a transformer of change through their research and development, curriculum and as a future-capable and skills-developing society agent through their efforts of creating awareness in society. These institutions' commitment to a "green strategy" is no longer a complementary option; it is an institutional and strategic necessity aimed at integrating environmental principles into all operations and decisions .

This transition requires a new kind of management and leadership that is of a different orientation. Here, one can refer to such a term as sustainable leadership, which deals with balancing economic performance with social justice in the long-term environmental responsibility. Sustainable leader is a radical who can guide and encourage an organization to go green without compromising the future life capacity to support itself and meet its needs. Despite the growth of the recognition of the effectiveness of sustainability, the gap exists between the academic target and the successful implementation of green policies in the realms of higher educations in the Kurdistan Region of Iraq.

### 1. Research Methodology

#### 1.1. Research Problem Statement

The introduction of effective green policies has turned into an institutional priority in the context of world environmental challenges and increasing



demands on higher education institutions (HEIs) to be able to demonstrate sustainable behavior. The concept of sustainability is becoming popular but most HEIs are not able to incorporate environmental initiatives into their main operations. There is still a critical gap in comprehending how sustainable leadership can be used to influence green adoption of strategy especially in public universities in a developing or transitioning environment. In addition, the mediation of organizational learning in this relationship has not been well studied. The gap needs to be addressed in order to facilitate the process of environmentally responsible governance and performance of universities.

The problem of the study lies in the following questions:

1. What is the influence of sustainable leadership on green strategy adoption in higher education institutions?
2. How do different dimensions of sustainable leadership (visionary thinking, ethical behavior, stakeholder engagement) contribute to sustainability practices?
3. To what extent does organizational learning mediate the relationship between sustainable leadership and green strategy adoption?
4. Are there statistically significant differences in green strategy adoption based on the level of sustainable leadership practices within the institution.

## 1.2 Research Objectives

1. To examine the relationship between sustainable leadership and green strategy adoption in higher education institutions.



2. To identify the impact of various dimensions of sustainable leadership (visionary thinking, ethical behavior, stakeholder engagement) on the implementation of green strategies.
3. To assess the mediating role of organizational learning in the relationship between sustainable leadership and green strategy adoption.
4. To provide strategic recommendations for enhancing sustainability initiatives through leadership and institutional learning practices.

### 1.3. Important research

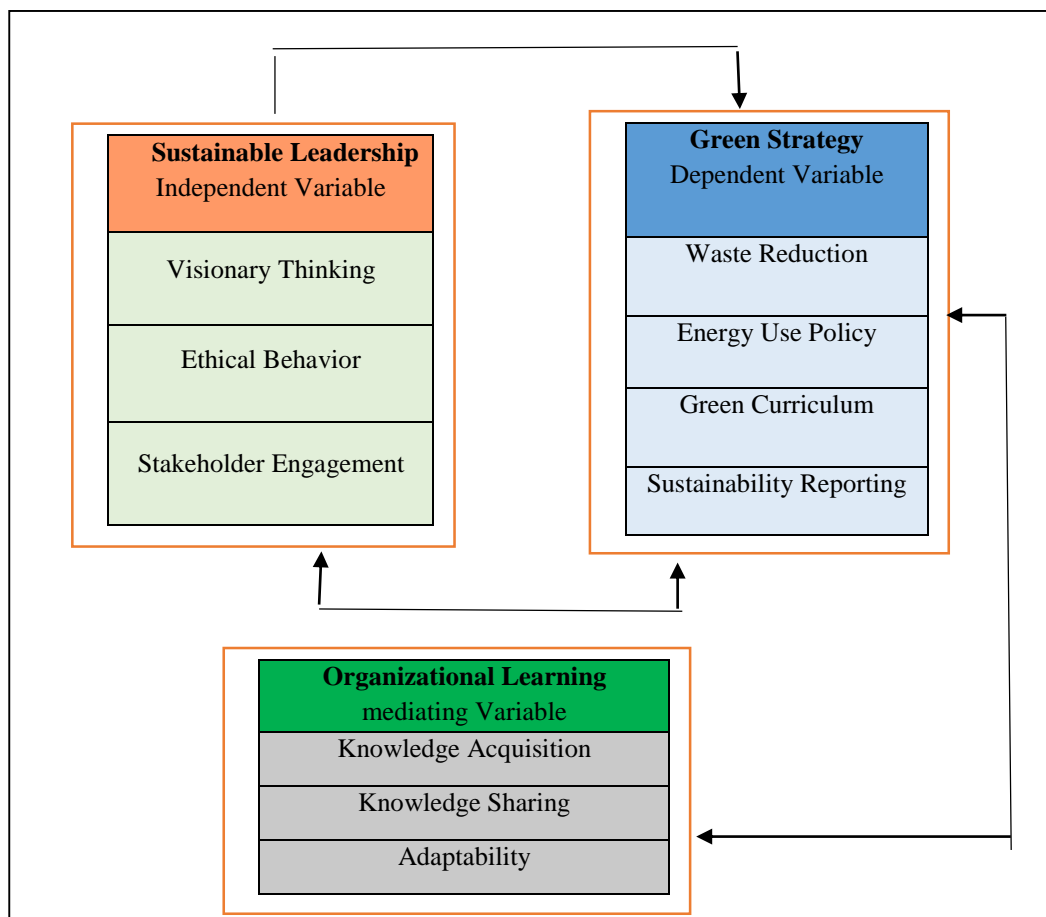
**A. Sanctify important:** This research paper fills the existing knowledge gap in the literature on research studies because lack of research that integrates these three concepts within a single study, especially in Middle East. The study develops a conceptual framework to construct a model that demonstrates the role of sustainable leadership in fostering green strategy adoption through organizational learning. It proposes new roles to emphasize organizational learning's critical function as the central mechanism for implementing green ideas and turning them into practical, sustainable organizational activities.

**B. Practical importance:** The research offers tools and practices that can be applied directly, which assist in guiding the policy and offer realistic suggestions to the university leaders and decision-makers regarding the way sustainability can be incorporated into the strategic plans and educational programs. It will, also, assist institutions to evaluate their preparedness of the green transformation and pinpoint where they can improve. Moreover, it helps to enhance institutional culture to create awareness of the relevance of sustainability and involve all stakeholders in the achievement of environmental objectives, including faculty and students as well as staff.



**1.4. Research Model:** A hypothetical model has been derived by use of Sustainable Leadership as an independent variable and the Green Strategy as dependent variable and the Organizational Learning as a Moderating variable and the demonstrates that it is possible to create an environment that is contributing to the Adoption in Higher Education Institutions Such as universities and

institutes, the extent to which the variables are related with the work environment under study is indicated as shown in Figure No. (1) also indicates the relationship of the three variables with the work environment under study



**Figure No. (1) Research Model**

Correlation relationship ↔  
 Influence relationship →



**Source: Prepared by researchers**

### **1.5. The hypothetical research model:**

The main hypothesis is no statistically significant effect of sustainable leadership on green strategy adoption in higher education institutions. And the sub-hypotheses are as follows:

H1: There is a statistically significant positive effect of sustainable leadership on green strategy adoption in higher education institutions.

H2: Organizational learning plays a mediating role in the relationship between sustainable leadership and green strategy adoption.

H3: H3: The dimensions of sustainable leadership (Visionary Thinking, Ethical Behavior, Stakeholder Engagement) directly and positively influence green strategy adoption.

H4: The higher the level of organizational learning (individual, group, or institutional learning), the greater the ability of the institution to effectively adopt and implement green strategies.

H5: Green strategy translates into tangible practices (such as Waste Reduction, Energy Use Policy, Green Curriculum, Sustainability Reporting, and integrating sustainability into curricula), and these practices are positively influenced by sustainable leadership.

**1.6. Research Community Sample:** The sample size (883) out of (83800) academic staff, administrative staff and students. within (33) public and private universities and Institutions of the Kurdistan Region of Iraq. So Measurement of Variables: Independent variable (Sustainable Leadership, Dimension:3), dependent variable (Green Strategy Dimension:4), and Moderating Variable (Organizational Learning, Dimension:3) 5-point Likert scale.



### 1.7. Reliability Analysis of Study Constructs Using Cronbach's Alpha

The Reliability Analysis of Study Constructs Using Cronbach's Alpha is shown in Table 1.

**Table 1:** Reliability Analysis of Study Constructs Using Cronbach's Alpha

Variables	Cronbach's Alpha	N of Items
<b>Sustainable Leadership</b>		
Visionary Thinking	0.882	5
Ethical Behavior	0.792	5
Stakeholder Engagement	0.827	5
<b>Green Strategy</b>		
Waste Reduction	0.903	5
Energy Use Policy	0.888	5
Green Curriculum	0.867	5
Sustainability Reporting	0.918	5
<b>Organizational Learning</b>		
Knowledge Acquisition	0.828	5
Knowledge Sharing	0.816	5
Adaptability	0.858	5

**Source:** Prepared by researchers

The reliability of the study structures can be indicated in terms of Cronbach's alpha as shown in Table 1. Internal stability is high in all dimensions, alpha value of Cronbach between 0.792 and 0.918, higher than the universally recognized measure of 0.70. It is especially the case with Sustainable Leadership dimensions - Vision Thinking ( $\alpha = 0.882$ ) that display strong reliability, ethical behavior ( $\alpha = 0.792$ ), and stakeholder ( $\alpha = 0.827$ ). Likewise, waste reduction ( $\alpha = 0.903$ ), energy use policy ( $\alpha = 0.888$ ), green curriculum ( $\alpha = 0.867$ ) and the Sustainability Reporting ( $\alpha = 0.918$ ) demonstrates good reliability in terms of the variable of the green strategies. The dimensions of organizational learning- Knowledge Acquisition ( $\alpha = 0.828$ ), knowledge sharing ( $\alpha = 0.816$ ) and adaptability ( $\alpha = 0.858$ ) are also



highly reliable. These findings show that the measures employed by the study are effective in conducting reliable and further statistical analysis.

## 2. Literature Review

### 2.1. Sustainable Leadership: Definitions and Dimensions

Sustainable leadership (SL) has increasingly come to be understood as a rich and multi-layered paradigm that brings together several fundamental elements, namely, forward-thinking vision, adherence to ethical principles, and the practice of inclusive and participatory governance. SL ensures that long-term environmental, social, and economic concerns are strategically and simultaneously embedded in all major organizational decisions (Zada et al., 2024; Eustachio et al., 2024). This leadership model regularly connects with the ideas of transformational leadership, mainly due to TL's effectiveness at inspiring and galvanizing all levels of an institution. TL moves beyond merely meeting the minimum requirements of sustainability and instead motivates individuals and collectives toward a shared vision of progressive, often visionary, sustainability outcomes (Priatna et al., 2025).

In a university setting, sustainable leadership (SL) isn't just an idea; it's a vital, hands-on approach. Its importance is highlighted because it acts as the practical method for ensuring the institution's core goals—like research, teaching, and community involvement—are directly connected to and support wider sustainability objectives. This connection is usually made possible by continuously talking with people both inside and outside the university and by using clear, ethical ways to govern the institution (Iqbal and Piwovar-Sulej, 2022). Sajjad et al. (2024) further elaborate on this notion by characterizing sustainable leadership as inherently inclusive and systematically oriented. They suggest that SL is uniquely capable of



managing the complex balancing act between immediate operational demands and the pursuit of long-term sustainability objectives.

Empirical studies increasingly confirm that Green Transformational Leadership (GTL) plays a pivotal role in shaping organizational outcomes. It is highly effective at fostering a culture where environmental consciousness is a shared value, primarily by driving employees' eco-friendly behaviors. Additionally, GTL enhances an organization's readiness and ability to successfully carry out sustainability-driven innovation. (Çop et al., 2020; Abbas, 2024; Mousa et al., 2025). Alongside this, there is a growing recognition of leadership styles that prioritize stakeholder engagement, particularly those informed by Nordic governance traditions. These approaches place a high value on transparency, collaboration, and the establishment of clear, well-defined frameworks for governance, all of which are crucial for cultivating an environment in which sustainability can thrive (Strand, 2024).

## **2.2. Green Strategy in Higher Education Institutions: Components and Challenges**

With their power to generate and spread knowledge as well as their role as influential community players, Higher Education Institutions (HEIs) hold a distinctive and powerful position in advancing the global move toward sustainability transformation. Their leadership in this area stems not only from their capacity to educate future leaders and professionals but also from their ability to model sustainability practices within their institutional operations and external engagements.

At the institutional level, the implementation of a comprehensive green strategy typically encompasses several interconnected components. One of



the primary elements involves the integration of sustainability-related themes and concepts directly into academic curricula across various disciplines, thereby fostering a culture of environmental awareness and responsibility among students. In addition to pedagogical shifts, sustainable leadership in HEIs also reveals through environmentally conscious campus operations and infrastructure development, this includes the construction and maintenance of green buildings, the use of renewable energy sources, and the adoption of resource-efficient practices.

A key part of a Higher Education Institution's (HEI) green strategy is building strong, cooperative relationships with everyone involved: students, faculty, the wider community, and policymakers. This commitment to engagement is generally paired with a promise of transparency. Specifically, HEIs should regularly monitor and publicly report on how well they're doing on sustainability performance, using the United Nations Sustainable Development Goals (SDGs) as a benchmark. (Zhou, 2025; Holst, 2022; Angelaki et al., 2024).

However, the degree to which such sustainability initiatives have been institutionalized varies considerably across different regional and national contexts. Empirical research from diverse global settings reveals a spectrum of progress. For example, Fissi et al. (2021) Institutions are seeing tangible results from sustainability efforts, such as promoting clean transit and enacting strong waste reduction plans. Despite this success, implementation is often hampered by significant barriers: scarce funding, decentralized leadership, and disjointed sustainability policies that reduce both coordination and institutional accountability (Basheer et al., 2025; Zuin et al., 2021).



Leal Filho et al. (2025a) also present pedagogy as a substance of sustainability capability in students. However, low adoption of standardized tests and interdisciplinarity impede departmental-level implementation of green strategy (Onyeaka and Akinsemolu, 2025; Biancardi et al., 2023).

### **2.3. Organizational Learning: Role in Sustainability Adoption**

Organizational learning plays a vital role in facilitating sustainability transitions. Learning-friendly institutions are always improving through stakeholder input, curriculum revision, and green innovation (Shrestha and Adhikari, 2022; Shehzad et al., 2025).

Learning Organization Theory sets a good beginning with systems thinking, learning through the use of loops of feedback, and knowledge of a cross-functional nature (Weiss et al., 2021; Kohl et al., 2022). Higher green learning orientation and absorptive capacity institutions execute sustainable technology and practices with greater efficiency (Riaz et al., 2024; Zada et al., 2025).

Emerging pedagogical approaches, most notably service learning and the implementation of living labs, have been increasingly recognized for their potential to provide students with immersive, real-world learning experiences that extend beyond traditional classroom instruction. These experiential learning models are designed to bridge academic theory with practical application, allowing students to engage directly in sustainability challenges in tangible, community-based, or institutional contexts. Through such engagements, learners not only deepen their understanding of sustainability issues but also contribute meaningfully to the development of a broader culture of sustainability within their institutions (Rodriguez-Zurita et al., 2025; Husic, 2024). While new teaching methods are gaining ground,



Fuchs (2024) notes that critical issues remain. The main concerns are the inconsistent embedding of green skills in courses, leading to unequal preparation of students for sustainability roles, and a lack of consistent, long-term assessment to prove their effectiveness and scalability in higher education.

#### 2.4. Theoretical Underpinnings

The academic literature on how higher education institutions (HEIs) can achieve sustainability relies on three main theoretical models. While each model is distinct, they work together to offer a complete picture of how institutions can effectively pursue sustainability initiatives as follows:

Firstly, Transformational Leadership is key to driving institutional change through visionary and ethical guidance. It shows that leaders in Higher Education Institutions (HEIs) must establish a strong vision, encourage intellectual challenge, and act with moral integrity to successfully embed sustainability into their operations. This approach makes it easier for HEIs to articulate and realize their ambitious sustainability objectives. (Mousa et al., 2025; Huang, Ting and Li, 2021).

Secondly, The Learning Organization Theory offers a way to view sustainability as an ongoing, continuously improving process. This theory emphasizes organizational learning, active stakeholder engagement, and a dedication to iterative improvement. For higher education institutions (HEIs), this perfectly complements the Whole Institution Approach, which insists on embedding sustainability into all facets of the university: curricula, governance, campus operations, and community outreach. Adopting this framework allows HEIs to become adaptive and resilient systems that can



effectively address intricate sustainability challenges inclusively (Holst, 2022; Kohl et al., 2022).

Thirdly, The Natural Resource-Based View (NRBV) argues that organizations can gain a competitive edge and boost their reputation by developing unique internal capabilities focused on sustainability. Instead of simply seeing environmental responsibility as an obligation, the NRBV suggests that things like green leadership, a values-driven culture, and a strong commitment to environmental stewardship are valuable assets that drive environmental performance and offer strategic benefits (Gazi et al., 2025).

These ideas combine to show that learning and leadership are not just side issues, but are fundamental and linked processes necessary for academic institutions to achieve sustainability. They emphasize that sustainability isn't a final goal, but an ongoing, collaborative journey that demands adaptive leadership, continuous organizational learning, and smart use of the institution's existing strengths.

### 3.Results

In the study, Sustainable Leadership and Green Strategy Adoption in Higher Education Institutions: Assessing the Role of Higher Education Institutions the sample of the study, which includes the Universities of Kurdistan Region-Iraq, in terms of administrative staff, Student, Academic staff, this paper has conducted a comprehensive review of the data attributes to get valid results. The study gathered (885) effective questionnaires out of its (887) reported subjects. The cleaning process made (883) recordable records to be able to be analyzed. Several statistical characteristics within SPSS enabled the assessment of the opinions of the participants along with the



assessment of the important relationships between the key variables. This research was based on several statistical techniques that comprised of descriptive statistics that utilized the mean and standard deviation values along with reliability testing expressed in terms of Cronbachs alpha that were used to derive correlation analysis using Pearson correlation coefficient and consequently, linear regression. The measurements of each response were taken according to a five-point Likert scale that was used by participants.

### 3.1. Frequency Distribution of Respondents' Demographic Characteristics

The frequency Distribution of Respondents' Demographic Characteristics appears in Table 2

**Table 2.** Frequency Distribution of Respondents' Demographic Characteristics

Variable	Category	Frequency	Percent
Gender	Male	644	72.9
	Female	239	27.1
	Total	883	100
Years of Experience	Less than 5 years	188	21.3
	5–10 years	135	15.3
	Over 10 years	560	63.4
	Total	883	100
Role in University	Student	216	24.5
	Administrative staff	208	23.6
	Academic staff	459	52
	Total	883	100

Source: Prepared by researchers

Table 2 indicates that the ratio of males to females was 72.9: 27.1 respectively. In regards to professional experience, the majority of the respondents were experienced (63.4%), less than 5 years of experience and 5-10 years of experience accounted for 21.3 and 15.3 respectively. With respect to his position in the



university, the greatest number (52%) of the academic staff was then succeeded by students (24.5%), then administrative staff (23.6%).

### 3.2. Regression Analysis of the Effect of Sustainable Leadership on Green Strategy Adoption

The Regression Analysis of the Effect of Sustainable Leadership on Green Strategy Adoption appears in Table 3.

**Table 3.** Regression Analysis of the Effect of Sustainable Leadership on Green Strategy Adoption

Model	B	t	Sig.	F	P-Value	R Square
(Constant)	0.195	2.621	0.009	1480.928	0.000	0.627
Sustainable Leadership	0.838	38.483	0.000			

Source: Prepared by researchers

As revealed in Table 3, sustainable leadership positively and statistically significantly influences the utilization of green strategies. The coefficient is non-standard ( $B = 0.838$ ), indicating that with a one-unit increase in sustainable leadership, assuming a green strategy, the corresponding increase is 0.838 units. The overall model is important ( $f = 1480,928$ ,  $p < 0.001$ ) and the effect is very important ( $T = 38,483$ ,  $p < 0.001$ ). The  $r$  value of 0.627 indicates that sustainable leadership is a significant predictor of green strategy adoption, with a contribution of 62.7 percent of the variance to green strategy adoption across institutions. This observation favored hypothesis 1.

### 3.3. Mediation Analysis of Organizational Learning in the Relationship Between Sustainable Leadership and Green Strategy Adoption

The Mediation Analysis of Organizational Learning in the Relationship Between Sustainable Leadership and Green Strategy Adoption appears in Table 4.

**Table 4.** Mediation Analysis of Organizational Learning in the Relationship Between Sustainable Leadership and Green Strategy Adoption

Effect Type	Effect (B)	SE	t	p	95% CI (LLCI, ULCI)
Total Effect (Sustainable Leadership → Green Strategy)	0.838	0.022	38.483	0.000	0.795 – 0.881
Direct Effect (Sustainable Leadership → Green Strategy controlling for Organizational Learning)	0.321	0.027	12.035	0.000	0.269 – 0.374
Indirect Effect (Sustainable Leadership → Organizational Learning → Green Strategy)	0.517	0.032 (BootSE)	–	–	0.458 – 0.585

Source: Prepared by researchers

Based on Table 4, the mediating effect of organizational learning in the association between sustainable leadership and the adoption of green strategies is noteworthy. The overall impact of sustainable leadership on green strategy is high and meaningful ( $B = 0.838$ ,  $p < 0.001$ ), but including organizational learning in the model, the direct impact drops to 0.321 ( $p < 0.001$ ). This mediation is partial. The indirect effect via organizational learning is also notable ( $B = 0.517$ ,  $BootCI = 0.458 - 0.585$ ), since the confidence arc is not centered on zero. This result was consistent with hypothesis 2.

### 3.4. Regression Analysis of Sustainable Leadership Dimensions on Green Strategy Adoption

The Regression Analysis of Sustainable Leadership Dimensions on Green Strategy Adoption appears in Table 5.

**Table 5.** Regression Analysis of Sustainable Leadership Dimensions on Green Strategy Adoption

Predictor Variable	B	t	Sig.	F	P-Value	R Square
(Constant)	0.611	9.484	0.000	1460.340	0.000	0.624
Visionary Thinking	0.714	38.214	0.000			
(Constant)	0.670	8.149	0.000	841.254	0.000	0.488
Ethical Behavior	0.692	29.004	0.000			
(Constant)	0.380	4.416	0.000	965.570	0.000	0.523



Stakeholder Engagement	0.785	31.074	0.000			
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Source: Prepared by researchers

Table 5 shows the regression analysis of the dimensions of sustainable leadership on the adoption of green strategy. The use of green strategy is strongly positively affected by each of the dimensions - Visionary Thinking, Ethical behavior and stakeholder engagement. The effect is significant ( $B = 0.714$ ,  $T = 38,214$ ,  $p < 0.001$ ,  $r \text{ fate} = 0.624$ ) and demonstrates that high visions among leaders are a strong predictor of using green strategies. The impact of ethical behavior is also significant ( $B = 0.692$ ,  $T = 29004$ ,  $p < 0.001$ ,  $R = 0.488$ ) and indicates that ethical action by leaders has a significant impact on green strategy initiatives. Likewise, the stakeholder has been estimated to adopt a green strategy ( $B = 0.785$ ,  $T = 31,074$ ,  $p < 0.001$ ,  $R = 0.523$ ), which emphasizes the significance of considering the work of the stakeholder. On balance, these findings support the fact that all key aspects of sustainable leadership influence the practice of green strategies in institutions and higher education. This observation affirmed hypothesis 3.

### 3.5. Multiple Regression Analysis of Organizational Learning and Stakeholder Engagement on Green Strategy Adoption

The Multiple Regression Analysis of Organizational Learning and Stakeholder Engagement on Green Strategy Adoption appears in Table 6.

**Table 6:** Multiple Regression Analysis of Organizational Learning and Stakeholder Engagement on Green Strategy Adoption

Predictor / Model Info	B	Std. Error	Beta	t	Sig.	R <sup>2</sup>	Adj. R <sup>2</sup>	Std. Error of Estimate	F	Sig. (ANOVA)
(Constant)	-0.344	0.063	—	-5.429	0.000	0.797	0.796	0.35899	859.945	0.000
Stakeholder Engagement	0.206	0.025	0.19	8.199	0.000					
Knowledge Acquisition	0.339	0.032	0.316	10.55	0.000					



Knowledge Sharing	0.483	0.04	0.453	12.12	0.000					
Adaptability	0.01	0.028	0.01	0.354	0.723					

Source: Prepared by researchers

Table 6 shows that the aggregate model is highly significant ( $R = .893$ ,  $R^2 = .797$ ,  $F = 859,945$ ,  $p < .001$ ) and explains approximately 79.7% variance when it comes to using the green strategy. Out of these predictions, knowledge sharing ( $\beta = .453$ ,  $p < .001$ ) was the most influential, then knowledge acquisition ( $\beta = .316$ ,  $p < .001$ ) and stakeholder ( $\beta = .190$ ,  $p < .001$ ), whose impact was significant and positive. Nevertheless, adaptability ( $\beta = 0.010$ ,  $p = 0.723$ ) had no significant effect. These findings propose that using a green strategy in higher education institutions is strongly influenced by organizational learning processes - especially with knowledge sharing and acquisition - with stakeholder participation, while adaptability does not play an important role alone. This finding supported hypothesis 4.

### 3.6. Multiple Regression Analysis of Sustainable Leadership on Green Strategy Dimensions

The Multiple Regression Analysis of Sustainable Leadership on Green Strategy Dimensions appears in Table 7.

**Table 7:** Multiple Regression Analysis of Sustainable Leadership on Green Strategy Dimensions

Green Strategy Dimension	B	Std. Error	Beta	t	Sig.	R	R <sup>2</sup>	Adj. R <sup>2</sup>	F	Sig.
Waste Reduction	0.814	0.032	0.654	25.647	.000	0.654	0.427	0.427	657.77	.000
Energy Use Policy	0.793	0.03	0.666	26.489	.000	0.666	0.443	0.443	701.67	.000
Green Curriculum	0.813	0.024	0.75	33.61	.000	0.75	0.562	0.561	112.60	.000
Sustainability Reporting	0.931	0.024	0.789	38.18	.000	0.789	0.623	0.623	145.73	.000

Source: Prepared by researchers



Table 7 shows that sustainable leadership affects all studied dimensions by using a green strategy in institutions for higher education significantly and positively. In particular, the sustainable leadership has the strongest impact on reporting ( $\beta = .789, p < 0.001$ ) and the implementation of green curriculum ( $\beta = .750, p < 0.001$ ), followed by energy use policy ( $\beta = .666, p < .001$ ) and waste reduction ( $\beta = .654$ ). All models were very important, with  $R^2$  values ranging from .427 to .623, it shows that sustainable leadership indicates a sufficient proportion of variance in these green strategy practices. These findings suggest that higher levels of sustainable leadership within an institution are associated with more effective implementation of tangible green practices, with particular strength in reporting and curricular initiatives. This finding supported hypothesis 5.

#### 4. Conclusion & Recommendations

##### 4.1. Conclusion

According to the findings of this research, the significance of sustainable leadership in applying green strategies in institutions of higher learning is very crucial as well as fostering the execution of these strategies. Sustainable leadership does not only directly and significantly positively influence the use of a green strategy, but also acts indirectly via organizational learning, which is a mediating factor. Most critical aspects of sustainable leadership including visionary thinking, ethical behavior and the stakeholder engagement influenced the green strategy initiative and the organizational learning, particularly in knowledge acquisition and knowledge sharing enhances the capability of the institute to practice green effectively. Moreover, sustainability leadership was the major contributor of concrete green practice, such as waste minimization, and the greatest impacts were



observed in sustainability reporting and integration of curriculum, energy use policy, creation of green courses and stability reporting. In general, these findings suggest that sustainable leadership and promotion of the organizational learning processes among higher education institutions are required to reach efficient and holistic stability outcomes.

#### 4.2. Recommendations

1. As an institution, senior management should include the concept of sustainability and environmental responsibility as a component of its vision, mission, and core values.
2. Mechanisms and programs to promote shared and collective learning of green best practices as well as knowledge exchange among colleges and departments should be organized and implemented on a continuous basis.
3. Not just within disciplines that are pertinent to the concept of environmental sustainability, but broadly into all curricula.
4. Devote adequate budgets to fund green initiatives and sustainability-related scientific studies, and incentives (rewards, promotions) to individuals and departments who actively participate in implementing new green practices.
5. To measure progress in implementing the green strategy and its environmental impact, linking them to administrative accountability, Key performance indicators (KPIs) need to be developed.
6. Work to develop unified national policies and regulations that motivate and oblige higher education institutions to adopt green strategies, while providing the necessary technical and financial support for the transition.



7. Support the establishment of effective partnerships between universities, the private and public sectors, and civil society to implement innovative green solutions and transfer sustainable knowledge and technology.

8. Conduct comparative studies between different types of higher education institutions (governmental, private, technical) to identify differences in adopting the green strategy and the role of sustainable leadership.

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