

Educational Leadership and Managerial Effectiveness for Sustainable Development: A Study of Green Schools

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Abstract:

Sustainable development has become a critical focus in the education sector, with green schools playing a key role in promoting environmental responsibility and sustainable practices. Educational leadership, particularly the managerial and administrative effectiveness of school principals and administrators, is instrumental in translating sustainability goals into institutional practices. The present study examines the relationship between principals' managerial and administrative qualities and sustainability practices in green schools. The study adopts a descriptive and correlational research design and is based on primary data collected from 50 principals and administrators of green schools located at various cities. A structured questionnaire was used for data collection, comprising two constructs: managerial and administrative capabilities and sustainability practices in green schools, each measured through 10 statements on a five-point Likert scale. Descriptive statistics were employed to assess the overall level of the study variables, while Pearson's correlation analysis was applied to examine the relationship between managerial effectiveness and sustainability practices.

The findings reveal that principals demonstrate moderate to high levels of managerial and administrative qualities, and green schools show a positive orientation towards sustainability initiatives such as energy conservation, water management, waste reduction, and green curriculum implementation. The correlation analysis indicates a statistically significant positive moderate relationship between principals' managerial qualities and sustainability practices. The study highlights the importance of effective educational leadership and management in promoting sustainable development in schools.

Keywords- Sustainable Development, Sustainability, Green School

Introduction:

Sustainable development has emerged as a critical global priority in response to escalating environmental challenges, climate change, resource depletion, and growing social inequities. Educational institutions play a pivotal role in advancing sustainability by shaping attitudes, values, and behaviours of current and future generations. Among these institutions, schools occupy a foundational position, as they not only impart knowledge but also model practices that influence lifelong habits. In this context, the concept of *green schools* has gained increasing attention worldwide. Green schools go beyond environmental awareness by integrating sustainability into curriculum, infrastructure, governance, and daily operational practices, thereby promoting environmentally responsible and socially conscious education. The successful implementation of sustainability initiatives in schools largely depends on effective educational

leadership and sound managerial practices. School principals and administrators significantly influence policy execution, and organizational culture. Their managerial and administrative qualities determine how sustainability goals are conceptualized, communicated, and translated into action. Educational leadership for sustainable development therefore requires principals to balance pedagogical responsibilities with strategic planning, resource management, stakeholder engagement, and continuous monitoring of outcomes. Without effective leadership and management, sustainability efforts often remain symbolic.

From a management perspective, schools function as complex organizations that require systematic planning, coordination, and evaluation. Managerial effectiveness in schools encompasses delegation of responsibilities, participative decision-making, motivation of staff and students, efficient use of resources, and continuous performance

assessment. When aligned with sustainability objectives, these managerial practices can foster a culture of environmental responsibility and collective ownership among teachers, students, and the wider community. Principals who demonstrate strong managerial competencies are better positioned to integrate sustainability into academic activities, co-curricular programmes, infrastructure development, and community outreach initiatives. Educational leadership for sustainable development also emphasizes collaborative approaches, interdisciplinary learning, and experiential engagement. Green schools often rely on teamwork, shared leadership, and participatory governance to implement initiatives such as waste reduction, water and energy conservation, biodiversity enhancement, and eco-friendly transportation. In this process, principals act as change agents who inspire, guide, and support stakeholders while ensuring alignment with institutional priorities and regulatory frameworks. Their leadership style and administrative effectiveness can directly influence the depth, consistency, and impact of sustainability practices within the school environment.

Significance of Study:

Despite the growing emphasis on sustainability in education, empirical research examining the managerial and administrative dimensions of principal leadership in green schools remains limited, particularly in developing country contexts. Understanding the relationship between leaders' managerial effectiveness and the sustainability practices adopted by green schools is therefore essential for both theory and practice. Such insights can inform policy formulation, leadership development programmes, and institutional strategies aimed at promoting sustainable education. The study seeks to examine the relationship between principals' managerial and administrative capabilities and the extent of sustainability practices implemented in green schools. It also provides practical implications for school leaders, educational administrators, and policymakers striving to strengthen sustainability outcomes through effective leadership and management in schools.

Objective of the Study:

The primary objective of this study is to examine the relationship between educational leadership and managerial effectiveness of school principals and the level of sustainability practices implemented in green schools. Specifically, the study aims to assess how principals' managerial and administrative qualities and capabilities influence the planning, execution, and effectiveness of sustainable development initiatives within school environments. By examining this relationship, the study seeks to provide empirical insights into the role of leadership and management in promoting environmentally responsible practices in schools and to offer valuable implications for school management in strengthening sustainable school development.

Review of Literature:

The reviewed literature underscores that effective educational leadership and managerial capabilities of school principals are critical drivers for implementing sustainability practices in green schools, thereby justifying the focus of the present study. Existing literature highlights the growing significance of educational institutions in advancing sustainable development through leadership, curriculum integration, and organizational practices. Aleixo et al. (2020) examined the integration of Sustainable Development Goals (SDGs) in higher education institutions and emphasized the role of institutions in promoting social responsibility and sustainability awareness among students. The Global Sustainable Development Report (2019) underlined the interconnected nature of the SDGs and emphasized the need for evidence-based leadership and cross-sectoral partnerships to achieve sustainability goals. Several studies focus on the role of school culture and leadership in environmental sustainability. Blendinger, Hailey, and Shea (2015) highlighted that environmentally oriented school culture and experiential learning activities significantly foster ecological commitment among students. Carrick and Caywood (2015) further operationalized the concept of green schools for K-12 education, highlighting the importance of sustainable design, toxin-free environments, and quality learning

spaces. The Centre for Environment Education's *Paryavaran Mitra* initiative (2016) reinforced project-based environmental learning as a practical approach to sustainability in schools. Leadership effectiveness has also been linked with organizational and environmental outcomes. Gupta and Vohra (2010) pointed out the importance of effective leadership and organizational health in measuring school effectiveness in India. Farrahbakhs (2012) established a strong positive relationship between principals' leadership behavior and quality of work life, suggesting its influence on organizational climate. Verma and Sharma (2022) emphasized ethical and sociable leadership as essential for achieving sustainable development in green schools. Studies by Prashant Thote and Gowri (2020) and Kapoor et al. (2021) revealed gaps in green practices and environmental quality in Indian schools, indicating the need for strong managerial leadership.

Research Methodology:

The present study employs a descriptive and correlational research design to examine the relationship between educational leadership and managerial effectiveness of school principals and sustainability practices in green schools. The study focuses on green schools operating in various cities of the country that have shown growing institutional engagement with sustainability-oriented educational practices. The population of the study consists of principals of recognized green schools, and a sample of 50 school principals and administrators was selected using a purposive sampling technique. This method was adopted to ensure that respondents held key administrative positions and were directly involved in decision-making, planning, and implementation of sustainability initiatives within their schools. Primary data were collected through a structured questionnaire developed specifically for the study based on an extensive review of literature on educational leadership, school management, and sustainable development. The questionnaire comprises two major constructs i.e. 'Managerial and Administrative Qualities' and 'Sustainability Practices' in Green Schools. Each variable were measured using 10 statements. All statements were framed in a first-person format, as the respondents were school heads, and were measured using a

five-point Likert scale. The first variable (Managerial and Administrative Qualities) assesses the leadership and management effectiveness of school heads in academic, administrative, and sustainability-related contexts. The statements include encouragement of teamwork, delegation of responsibilities, participative decision-making, recognition and motivation of staff and students, effective administration, systematic monitoring etc. and effective utilization of human, financial, and physical resources for environmentally responsible practices. The second variable (Sustainability Practices) evaluates the extent to which sustainability practices are into school functioning. The statements cover adoption of a green curriculum, sustainable infrastructure, green activities, recycling strategies, water and energy conservation and other green initiatives in school. The internal consistency reliability of both constructs was tested using Cronbach's Alpha, and the scales were found to be reliable for further statistical analysis. The collected data were coded and analyzed using appropriate statistical software. Descriptive statistics were used to assess the overall level of managerial and administrative qualities of school heads and the extent of sustainability practices in green schools. To examine the relationship between the two variables, Pearson's correlation coefficient was applied. Participation in the study was voluntary, and respondents were informed about the academic purpose of the research.

Data Analysis:

The data collected through the structured questionnaire were systematically analysed to examine the relationship between leaders' managerial and administrative qualities and sustainability practices in green schools. While descriptive statistics were used to understand the overall level of the study variables, Pearson's correlation analysis was applied to test the formulated hypothesis and to determine the strength and direction of the relationship between managerial effectiveness and sustainable development practices in schools. The hypothesis formulated for the study is presented below.

H₀₁: There is no significant relationship between principals' managerial and administrative **qualities** and sustainability practices in green schools.

Descriptive statistics were used to understand the overall level of managerial and administrative qualities of principals and sustainability practices in green schools. The mean scores for different managerial and administrative qualities ranged from 3.52 to 4.00, indicating that principals generally perceived managerial and administrative qualities as a highly effective and important instrument. Higher mean values were observed for leadership in sustainability initiatives and delegation of responsibilities, suggesting a proactive managerial approach among principals of green schools. Similarly, the mean scores for different sustainability practices ranged from 3.54 to 4.14, reflecting an encouraging level of implementation of green initiatives across schools. Practices related to energy conservation, water management, green curriculum adoption, and regular environmental activities showed relatively higher mean values, indicating strong institutional commitment towards sustainable development. The standard deviation values across both variables remained within acceptable limits, suggesting reasonable consistency in responses among principals. Overall, the descriptive analysis indicates that the sample demonstrate a positive orientation toward both effective school management and sustainability practices, thereby providing a suitable basis for examining the relationship between these variables.

Managerial & Administrative Capabilities			
No.	Statements	Mean	Std. Dev
1	I encourage teamwork, collaboration, and interdisciplinary group activities among teachers and students, as I believe these are more effective than routine communication practices.	3.900	1.1112
2	I delegate academic and co-curricular responsibilities to teachers and students, which enhances students' active participation in school-based green initiatives.	3.960	1.0490
3	I involve teachers and students in the decision-making process and use case-based approaches to strengthen learning and problem-solving skills.	3.860	.9260
4	I recognize, reward, and acknowledge the contributions of students and staff to motivate them and improve their morale.	3.660	.9817
5	I believe that effective administration and sound management practices are critical to the overall success of a school.	3.520	1.0150
6	I ensure regular monitoring, systematic evaluation, and assessment of cost-effectiveness and quality of content and methods used in seminars, workshops, and school activities.	3.880	.8241
7	I assess student performance by considering academic achievement as well as personal and social development, and I modify teaching approaches accordingly.	3.780	.9322
8	I promote shared goals within the school by ensuring a strong commitment to quality in all aspects of school life and by clearly defining organizational priorities.	3.820	1.1192
9	I provide clear leadership in planning, implementing, and coordinating sustainability-oriented programmes and green initiatives in my school.	4.000	.9258
10	I effectively utilize available human, financial, and physical resources to promote environmentally responsible practices and achieve long-term institutional objectives.	3.860	.9691

Sustainability Practices			
No.	Statements	Mean	Std. Dev
1	The school follows a structured green curriculum along with a well-planned annual green activity calendar.	3.980	.9581
2	School buildings and infrastructure are designed with sustainability and environmental responsibility in mind.	3.880	1.0999
3	Environmental and green activities are conducted regularly within the school campus and in the surrounding community.	3.940	.9127
4	The school has established effective measures for minimizing waste generation and promoting recycling practices.	3.860	.9899
5	Water conservation methods such as rainwater harvesting, drip irrigation, or sprinkler systems are implemented within the school premises.	4.040	.9026
6	The school makes consistent efforts to reduce electricity and fuel consumption and encourages the use of renewable energy sources.	4.140	.6392
7	The campus includes medicinal plants, flowering plants, kitchen gardens, and a diverse range of trees and plant species.	3.540	.9941
8	The use of chemical fertilizers, pesticides, plastic materials, and plastic waste burning is strictly prohibited in the school.	3.700	1.0152
9	Teachers receive regular training related to environmental initiatives, green technologies, and recent sustainability developments.	3.580	1.2137
10	The school actively promotes and supports environmentally friendly modes of transportation.	3.820	.7197

To examine the relationship between principals' managerial and administrative capabilities and sustainability practices in green schools, Pearson's correlation test was applied. The results reveal a positive and statistically significant correlation between the two variables ($r = 0.689$, $p < 0.01$). This indicates that higher levels of managerial and administrative effectiveness among principals are associated with stronger implementation of sustainability practices in green schools. The correlation coefficient value of 0.689 suggests a moderate positive relationship, implying that while managerial effectiveness does not solely determine sustainability outcomes, it plays a substantial and influential role. School heads who demonstrate effective leadership, participative decision-making,

resource optimization, and systematic monitoring tend to foster better environmental practices and sustainable school initiatives. Since the p-value (0.000) is less than the significance level of 0.05, the null hypothesis is rejected, and the alternative hypothesis is accepted. This confirms that principals' managerial and administrative **capabilities** significantly influence sustainability practices in green schools.

Correlations Summary Managerial & Administrative Qualities & Sustainability Practices	
	Managerial & Administrative Qualities
Pearson Correlation	.689
Sig. (2-tailed)	.000
Significance	Yes
Hypothesis	Rejected
Relationship	Positive Moderate

The findings highlight the critical role of educational leadership and management in advancing sustainable development within school environments. Effective managerial practices enable principals to translate sustainability goals into actionable strategies, thereby strengthening green school initiatives. The results reinforce the argument that sustainability in education is not merely curriculum-driven but is strongly shaped by leadership quality and administrative effectiveness.

Conclusion:

This study examined the relationship between principals' managerial and administrative capabilities and sustainability practices in selected green schools. The findings indicate that school heads exhibit moderate to high levels of managerial effectiveness, particularly in leadership for sustainability initiatives, delegation, participative decision-making, and efficient resource utilization. Green schools also demonstrate an encouraging level of sustainability practices, especially in areas such as energy and

water conservation, green curriculum implementation, waste management, and environmental activities. The Pearson correlation analysis reveals a statistically significant positive moderate relationship between principals' managerial effectiveness and sustainability practices. This confirms that effective educational leadership and sound management play a vital role in translating sustainability goals into actionable and consistent school practices. Principals with strong managerial competencies are better equipped to foster an environmentally responsible culture and ensure the effective implementation of green initiatives. The study highlights that sustainable development in schools extends beyond infrastructure and curriculum and is strongly influenced by leadership quality and administrative efficiency. While the study is limited by sample size and regional coverage, it provides valuable empirical evidence on the importance of managerial leadership in green schools. Future studies may broaden the scope by including additional variables and diverse educational contexts.

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