SCIENTIFIC CULTURE

www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 12, No. 2.1, (2026), pp. 15690-15697
Open Access. Online & Print

DOI: 10.5281/zenodo.20614174

MANAGERIAL LEADERSHIP AND THE DEVELOPMENT OF ENVIRONMENTAL COMPETENCIES AMONG UNIVERSITY TEACHERS

Amelia Cristina Mamani Huanca[1*], Rosario Del Pilar Telles Velasquez[2], Elizabeth Soledad Chucuya Mamani[3] and Evelyn Massiel Portugal Mamani[4]

[1]Universidad Privada de Tacna-Facultad de Ciencias Empresariales, Email: ameliamamani11@hotmail.com Orcid ID: https://orcid.org/0000-0003-2936-912X
[2]Universidad Nacional Jorge Basadre Grohmann. Escuela Profesional de Medicina Veterinaria y Zootecnia, Email: articlab2@gmail.com Orcid ID: https://orcid.org/0000-0002-1057-0854
[3]Universidad Nacional Jorge Basadre Grohmann. Escuela Profesional de Medicina Veterinaria y Zootecnia, Email: articlab3@gmail.com Orcid ID: https://orcid.org/0000-0003-2728-6400
[4]Dirección Regional de Agricultura Tacna, Email: articlab4@gmail.com Orcid ID: https://orcid.org/0000-0002-3113-9211

Received: 04/04/2026
Accepted: 20/05/2026

Corresponding Author: Amelia Cristina Mamani Huanca (ameliamamani11@hotmail.com)

ABSTRACT

The development of environmental competencies among university teachers has become a strategic priority in higher education institutions due to global sustainability challenges and the urgent need to promote environmentally responsible practices. In this context, managerial leadership plays a fundamental role in fostering organizational cultures that support environmental awareness, pedagogical innovation, and sustainable decision-making. The objective of this study was to determine the influence of managerial leadership on the development of environmental competencies among university teachers in a public university. A quantitative approach was adopted, using a non-experimental, cross-sectional, causal-correlational design. The study population consisted of 182 university teachers, with a census-type sample selected through non-probabilistic convenience sampling. Data were collected using validated questionnaires measuring managerial leadership and environmental competencies, considering cognitive, attitudinal, and practical dimensions. Statistical analysis was performed using SPSS version 27, applying descriptive statistics, normality tests, and ordinal logistic regression. The results revealed a statistically significant influence of managerial leadership on the development of environmental competencies ($p < 0.001$), with a Nagelkerke coefficient of 0.762, indicating that managerial leadership explains 76.2% of the variance in environmental competencies among teachers. These findings highlight the importance of strengthening managerial leadership capacities oriented toward sustainability in higher education institutions. It is concluded that effective managerial leadership significantly contributes to the consolidation of environmental competencies, promoting sustainable educational practices and institutional commitment to environmental responsibility.

KEYWORDS: Managerial Leadership; Environmental Competencies; University Teachers; Sustainability; Higher Education.

1. INTRODUCTION

In recent decades, environmental sustainability has emerged as one of the most pressing global challenges, demanding active participation from all social sectors, particularly higher education institutions. Universities play a strategic role in shaping future professionals, not only by transmitting disciplinary knowledge but also by fostering environmental awareness, ethical responsibility, and sustainable behaviors (UNESCO, 2021). In this context, the development of environmental competencies among university teachers has become a critical factor for integrating sustainability into teaching, research, and institutional management.

Environmental competencies are understood as a set of knowledge, skills, attitudes, and values that enable individuals to understand environmental problems, make informed decisions, and act responsibly in favor of sustainable development (Wiek et al., 2016). For university teachers, these competencies are essential for incorporating environmental perspectives into curricula, promoting critical thinking, and modeling sustainable practices for students. However, the effective development of such competencies does not occur in isolation; it is strongly influenced by organizational conditions and leadership practices within universities.

Managerial leadership has been widely recognized as a key determinant of institutional effectiveness and teacher development. Educational leaders who promote participatory management, strategic vision, and innovation can create environments conducive to professional growth and continuous improvement (Leithwood et al., 2020). In the context of sustainability, managerial leadership is expected to guide institutional policies, allocate resources, and motivate academic staff toward environmentally responsible practices.

Despite the growing relevance of sustainability in higher education, empirical evidence linking managerial leadership to the development of environmental competencies among university teachers remains limited, particularly in Latin American contexts. Many universities still face challenges such as insufficient leadership training, weak environmental policies, and limited institutional commitment to sustainability (OECD, 2020). These gaps hinder the systematic integration of environmental education and the consolidation of competencies among teaching staff.

Therefore, this study seeks to address this research gap by analyzing the influence of managerial leadership on the development of environmental competencies among university teachers in a public university. Understanding this relationship will provide valuable insights for decision-makers and educational leaders, supporting the design of leadership strategies that foster sustainability-oriented professional development and contribute to the achievement of institutional and societal environmental goals.

2. THEORETICAL FRAMEWORK

2.1. Managerial Leadership In Higher Education

Managerial leadership in higher education refers to the capacity of institutional leaders to plan, organize, direct, and control academic and administrative processes in order to achieve organizational goals effectively and sustainably. Unlike traditional hierarchical leadership models, contemporary managerial leadership emphasizes participatory decision-making, strategic vision, innovation, and accountability (Bush & Glover, 2019). In universities, managerial leadership is essential for aligning institutional policies with educational quality, social responsibility, and sustainable development.

Educational leadership theories highlight that managerial leaders influence organizational culture by shaping values, norms, and professional practices among academic staff (Leithwood et al., 2020). Effective managerial leadership fosters trust, collaboration, and motivation, which are crucial for promoting professional development and institutional change. In this sense, leaders act not only as administrators but also as change agents who guide universities toward long-term strategic objectives, including sustainability goals.

In the context of sustainability, managerial leadership plays a decisive role in integrating environmental principles into institutional governance. Leaders who prioritize sustainability are more likely to promote green policies, allocate resources for environmental initiatives, and encourage faculty participation in sustainability-oriented projects (Alonso-Almeida et al., 2020). Thus, managerial leadership becomes a catalyst for embedding environmental responsibility within higher education institutions.

2.2. Dimensions Of Managerial Leadership

Managerial leadership in higher education is commonly analyzed through multiple dimensions that reflect its comprehensive nature. Among the most relevant dimensions are pedagogical, administrative, and institutional leadership, each

contributing differently to teacher development and organizational effectiveness.

Pedagogical leadership focuses on guiding teaching and learning processes, supporting curriculum innovation, and promoting continuous professional development among teachers (Hallinger, 2020). Leaders who emphasize pedagogical leadership encourage reflective teaching practices, interdisciplinary approaches, and the incorporation of sustainability concepts into academic programs.

Administrative leadership involves the efficient management of human, financial, and material resources. This dimension ensures that institutional structures and processes support academic activities and professional growth (Bush, 2021). In relation to environmental competencies, administrative leadership facilitates the implementation of sustainability programs, training activities, and environmental management systems within universities.

Institutional leadership refers to the articulation of vision, mission, and strategic planning aligned with societal demands. This dimension is particularly relevant for promoting sustainability, as it integrates environmental commitment into institutional identity and long-term planning (Velazquez et al., 2019). Strong institutional leadership enables universities to position themselves as socially responsible organizations committed to sustainable development.

2.3. Environmental Competencies In University Teachers

Environmental competencies are defined as an integrated set of knowledge, skills, attitudes, and values that enable individuals to understand environmental issues and act responsibly in favor of sustainability (Wiek et al., 2016). In the context of higher education, university teachers play a central role in developing these competencies, as they influence students' learning processes and professional orientations.

The development of environmental competencies among teachers is essential for incorporating sustainability into curricula and promoting environmentally responsible behaviors in academic communities. Teachers with strong environmental competencies are better prepared to design learning experiences that address complex environmental challenges, encourage critical thinking, and foster ethical responsibility (Lozano et al., 2019).

Recent studies emphasize that environmental competencies are not limited to environmental sciences but are transversal across disciplines, requiring institutional support and leadership commitment (Cebrián et al., 2020). Consequently, universities must create favorable conditions for teachers to acquire and strengthen these competencies through training, incentives, and supportive leadership practices.

2.4. Dimensions Of Environmental Competencies

Environmental competencies are commonly structured into three interrelated dimensions: cognitive, attitudinal, and practical. This multidimensional approach allows for a comprehensive understanding of how individuals engage with environmental issues.

The cognitive dimension refers to knowledge and understanding of environmental concepts, sustainability principles, and ecological systems. For university teachers, this includes awareness of global and local environmental challenges, environmental policies, and sustainable development frameworks (UNESCO, 2021). Cognitive competence provides the foundation for informed decision-making and effective teaching.

The attitudinal dimension encompasses values, beliefs, and dispositions toward environmental protection and sustainability. Teachers' environmental attitudes influence their motivation to integrate sustainability into their teaching practices and institutional activities (Kopnina & Meijers, 2019). Positive environmental attitudes are associated with ethical commitment and social responsibility.

The practical dimension involves the ability to apply environmental knowledge and attitudes in real-life contexts. This includes the implementation of sustainable practices in teaching, research, and daily academic activities, such as resource conservation, waste management, and participation in environmental initiatives (Sterling et al., 2022). Practical competence reflects the translation of sustainability principles into concrete actions.

2.5. Managerial Leadership And Environmental Competencies

The relationship between managerial leadership and the development of environmental competencies among university teachers is grounded in organizational and educational leadership theories. Transformational and instructional leadership models suggest that leaders influence teachers' beliefs, behaviors, and professional growth through vision, support, and motivation (Hallinger & Heck, 2019).

Empirical studies indicate that managerial leadership oriented toward sustainability significantly enhances teachers' engagement with environmental initiatives and competency development (Alonso-Almeida et al., 2020; Cebrián et al., 2020). Leaders who promote sustainability as a strategic priority create institutional environments that encourage learning, collaboration, and innovation related to environmental education.

Furthermore, managerial leadership facilitates the alignment between institutional sustainability policies and individual teaching practices. By providing training opportunities, recognizing environmental efforts, and fostering participatory governance, leaders contribute to the consolidation of environmental competencies among teachers (Lozano et al., 2019). Therefore, managerial leadership is a determining factor in advancing sustainability in higher education through the professional development of university teachers.

3. METHODOLOGY

3.1. Research Approach And Design

This study adopted a **quantitative research approach**, as it aimed to measure and statistically analyze the influence of managerial leadership on the development of environmental competencies among university teachers. Quantitative methods allow for objective evaluation of relationships between variables through numerical data and inferential statistical techniques (Hernández-Sampieri & Mendoza, 2018).

The research design was **non-experimental**, since the variables were not manipulated but observed as they occurred naturally within the institutional context. Additionally, a **causal-correlational design** was employed, as the study sought to determine the extent to which managerial leadership influences environmental competencies. The research was **cross-sectional**, because data were collected at a single point in time.

3.2. Population And Sample

The study population consisted of **182 university teachers** from a public university, representing different academic disciplines and faculties. Inclusion criteria included teachers with active teaching appointments during the academic period under study, while exclusion criteria included part-time lecturers hired under temporary service contracts or those on academic or medical leave.

A **census-type sample** was used, incorporating all 182 teachers who met the inclusion criteria. The sampling method was **non-probabilistic convenience sampling**, justified by institutional accessibility and the voluntary participation of respondents. This approach is commonly applied in educational research when the population is manageable and accessible (Creswell, 2019).

3.3. Variables And Operationalization

The study examined two main variables:

- **Independent Variable:** Managerial leadership
- **Dependent Variable:** Environmental competencies among university teachers

Managerial leadership was analyzed through three dimensions: pedagogical leadership, administrative leadership, and institutional leadership. Environmental competencies were structured into three dimensions: cognitive, attitudinal, and practical competencies. Each dimension was operationalized through measurable indicators aligned with the theoretical framework and existing literature on educational leadership and sustainability.

3.4. Data Collection Instruments

Data were collected using two structured questionnaires:

1. **Managerial Leadership Questionnaire**, consisting of 24 items distributed across the pedagogical, administrative, and institutional dimensions.
2. **Environmental Competencies Questionnaire**, composed of 21 items assessing cognitive, attitudinal, and practical dimensions related to environmental sustainability.

Both instruments were designed using a **five-point Likert scale**, ranging from 1 (strongly disagree) to 5 (strongly agree). Content validity was established through expert judgment, involving three specialists in educational management and environmental education. Reliability analysis using **Cronbach's alpha** yielded coefficients of 0.91 for the managerial leadership scale and 0.89 for the environmental competencies scale, indicating high internal consistency.

3.5. Data Collection Procedure

Data collection was conducted during the second academic semester of 2024. Prior to data collection, authorization was obtained from the university's academic authorities. Participants were informed about the objectives of the study, the voluntary nature of their participation, and the confidentiality of the information provided.

The questionnaires were administered electronically using institutional email systems,

ensuring accessibility and anonymity. Respondents completed the surveys within an estimated time of 15 minutes. All responses were automatically recorded and stored in a secure database for analysis.

3.6. Data Analysis Techniques

Data analysis was performed using **SPSS Statistics version 27.0**. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to describe the levels of managerial leadership and environmental competencies.

To determine the distribution of the data, the **Kolmogorov–Smirnov normality test** was applied, given that the sample size exceeded 50 participants. The results indicated non-normal data distribution ($p < 0.05$), justifying the use of **non-parametric statistical techniques**.

To test the research hypotheses and assess the influence of managerial leadership on environmental competencies, **ordinal logistic regression analysis** was employed. Model fit was evaluated using chi-square statistics and pseudo R-square coefficients (Cox and Snell, Nagelkerke, and McFadden), with a significance level set at $p < 0.05$.

3.7. Ethical Considerations

This study adhered to ethical principles of educational research. Participation was voluntary, informed consent was obtained from all participants, and data confidentiality was strictly maintained. No personal identifiers were collected, and the information was used exclusively for academic and scientific purposes.

4. RESULTS

4.1. Descriptive Results

4.1.1. Level Of Managerial Leadership

The descriptive analysis revealed that **managerial leadership** among university teachers was predominantly perceived at a **moderate level**. Specifically, 53.3% of respondents reported a regular level of managerial leadership, while 29.1% perceived it as high, and 17.6% identified it as low. These results indicate that although leadership practices are present within the institution, there remains significant potential for strengthening leadership capacities oriented toward sustainability.

Regarding the dimensions of managerial leadership, **pedagogical leadership** showed a regular level in 56.0% of respondents, highlighting partial support for innovation and sustainability-oriented teaching practices. **Administrative leadership** was perceived as regular by 50.5% of teachers, suggesting moderate effectiveness in resource management and institutional support mechanisms. Finally, **institutional leadership** reached a regular level in 54.4% of participants, reflecting the need for stronger strategic alignment between institutional vision and sustainability goals.

These findings suggest that managerial leadership, while functional, lacks a fully consolidated sustainability-oriented approach capable of systematically promoting environmental competencies.

4.1.2. Level Of Environmental Competencies Among University Teachers

The analysis of **environmental competencies** indicated that 57.7% of university teachers demonstrated a **moderate level** of environmental competencies, while 25.8% reached a high level and 16.5% exhibited a low level. This distribution reveals that most teachers possess basic environmental awareness, yet their competencies are not fully developed.

In terms of dimensions, the **cognitive dimension** showed a regular level in 52.2% of respondents, indicating partial knowledge of sustainability concepts and environmental challenges. The **attitudinal dimension** reached a regular level in 61.5% of participants, reflecting generally positive dispositions toward environmental responsibility but limited institutional reinforcement. The **practical dimension** presented a regular level in 49.5% of teachers, evidencing difficulties in translating environmental knowledge and attitudes into concrete teaching and institutional practices.

Overall, the descriptive results demonstrate that environmental competencies among university teachers remain at an intermediate stage of development, reinforcing the need for organizational and leadership-based interventions.

4.2. Normality Test

To determine the appropriate inferential statistical techniques, the **Kolmogorov–Smirnov test** was applied to both variables. The results indicated significance values below 0.05 for managerial leadership ($p < 0.001$) and environmental competencies ($p = 0.003$), confirming that the data did not follow a normal distribution.

Based on these findings, **non-parametric inferential analysis** was deemed appropriate, and ordinal logistic regression was selected to assess the influence of managerial leadership on environmental competencies.

4.3. Inferential Results

4.3.1. General Hypothesis Testing

The ordinal logistic regression analysis revealed a **statistically significant influence of managerial leadership on the development of environmental competencies among university teachers** (χ^2 = 188.472; $p < 0.001$). The model demonstrated strong explanatory power, with a **Nagelkerke pseudo R^2 value of 0.762**, indicating that managerial leadership explains approximately **76.2% of the variance** in environmental competencies.

These results confirm the acceptance of the general research hypothesis, demonstrating that higher levels of managerial leadership are associated with stronger development of environmental competencies among teachers.

4.3.2. Influence Of Managerial Leadership On The Cognitive Dimension

The analysis of the first specific hypothesis showed a significant influence of managerial leadership on the **cognitive dimension of environmental competencies** ($p < 0.001$). The Nagelkerke coefficient reached a value of **0.548**, indicating that managerial leadership accounts for **54.8% of the variance** in teachers' environmental knowledge and understanding.

This result suggests that leadership practices that promote training, academic guidance, and strategic communication play a crucial role in enhancing teachers' environmental knowledge.

4.3.3. Influence Of Managerial Leadership On The Attitudinal Dimension

Regarding the attitudinal dimension, the regression model revealed a statistically significant influence of managerial leadership ($p < 0.001$), with a **Nagelkerke value of 0.583**. This finding indicates that managerial leadership explains **58.3% of the variance** in teachers' environmental attitudes and values.

These results highlight the role of leadership in fostering ethical commitment, environmental responsibility, and positive dispositions toward sustainability within the academic community.

4.3.4. Influence Of Managerial Leadership On The Practical Dimension

Finally, the analysis of the practical dimension showed a strong and significant influence of managerial leadership ($p < 0.001$). The **Nagelkerke coefficient reached 0.701**, indicating that managerial leadership explains **70.1% of the variance** in the practical application of environmental competencies.

This result demonstrates that leadership support, institutional policies, and administrative facilitation are decisive factors in translating environmental awareness into concrete teaching and institutional practices.

5. DISCUSSION

The findings of this study provide empirical evidence supporting the significant influence of managerial leadership on the development of environmental competencies among university teachers. The general regression model demonstrated that managerial leadership explains a substantial proportion of variance in environmental competencies, confirming its strategic role in fostering sustainability-oriented professional development within higher education institutions.

The predominance of moderate levels of managerial leadership observed in the descriptive results aligns with previous studies indicating that leadership practices in universities often remain operational rather than transformational in nature (Bush & Glover, 2019; Hallinger, 2020). This suggests that while basic leadership structures exist, they are not yet fully leveraged to promote sustainability as an institutional priority. Consequently, leadership focused primarily on administrative efficiency may limit the systematic development of environmental competencies among academic staff.

Regarding environmental competencies, the results revealed that most teachers exhibit moderate levels across cognitive, attitudinal, and practical dimensions. This finding is consistent with research by Lozano et al. (2019) and Cebrián et al. (2020), who argue that although sustainability discourse has gained prominence in higher education, its practical integration into teaching and institutional practices remains limited. The moderate cognitive dimension indicates partial understanding of environmental challenges, which may hinder the effective incorporation of sustainability concepts into curricula.

The strong influence of managerial leadership on the cognitive dimension of environmental competencies highlights the importance of leadership in promoting access to training, information dissemination, and academic guidance related to sustainability. Leaders who prioritize professional development and knowledge sharing create favorable conditions for enhancing teachers' environmental literacy (UNESCO, 2021). This finding supports transformational leadership theories, which emphasize intellectual stimulation as a key

mechanism for professional growth (Leithwood et al., 2020).

Similarly, the significant influence of managerial leadership on the attitudinal dimension underscores the role of leadership in shaping organizational culture and values. Educational leaders who model ethical behavior and environmental commitment can positively influence teachers' attitudes toward sustainability, fostering a sense of responsibility and collective engagement (Kopnina & Meijers, 2019). This aligns with organizational behavior theories suggesting that leadership values are transmitted through institutional norms and practices.

The strongest effect of managerial leadership was observed in the practical dimension of environmental competencies. This result reinforces the argument that leadership is crucial for translating environmental awareness into concrete actions. Administrative support, institutional policies, and resource allocation are essential for enabling teachers to implement sustainable practices in teaching and daily academic activities (Sterling et al., 2022). Without strong managerial leadership, environmental initiatives often remain symbolic rather than operational.

Overall, the findings of this study contribute to the existing literature by empirically demonstrating the multidimensional impact of managerial leadership on environmental competencies in higher education. Unlike previous studies that have examined leadership and teacher development in general terms, this research specifically focuses on sustainability-oriented competencies, thereby extending theoretical understanding and providing practical insights for university governance.

6. CONCLUSIONS

This study demonstrated that managerial leadership plays a decisive role in the development of environmental competencies among university teachers. The empirical evidence confirmed that managerial leadership significantly influences teachers' environmental competencies across cognitive, attitudinal, and practical dimensions, explaining a substantial proportion of their variance. These findings reinforce the idea that leadership is not merely an administrative function but a strategic mechanism for promoting sustainability in higher education.

The results revealed that both managerial leadership and environmental competencies were predominantly perceived at moderate levels. This indicates that, while universities have initiated efforts toward sustainability, these actions remain insufficient to fully consolidate environmental competencies among academic staff. Consequently, there is a clear need to strengthen leadership practices oriented toward sustainability-driven professional development.

Furthermore, the strongest influence of managerial leadership was observed in the practical dimension of environmental competencies. This suggests that leadership effectiveness is particularly critical in enabling teachers to translate environmental knowledge and attitudes into concrete actions within teaching and institutional practices. Therefore, universities seeking to advance sustainability should prioritize leadership development as a core strategy.

Overall, this research contributes to the literature by providing empirical evidence from a higher education context, highlighting managerial leadership as a key determinant in fostering environmental competencies and supporting the integration of sustainability into university systems.

7. PRACTICAL AND POLICY IMPLICATIONS

From a practical perspective, the findings suggest that universities should invest in **leadership development programs** that explicitly incorporate sustainability principles. Training initiatives for academic leaders should emphasize strategic planning, participatory governance, and environmental responsibility to strengthen their capacity to promote environmental competencies among teachers.

At the institutional level, universities are encouraged to integrate sustainability into their **strategic plans**, performance evaluation systems, and professional development policies. Managerial leadership should facilitate access to continuous training, interdisciplinary collaboration, and incentives for environmentally responsible teaching and research practices.

From a policy perspective, higher education authorities and policymakers should recognize managerial leadership as a critical lever for advancing sustainability agendas. National and regional education policies could incorporate leadership standards and accreditation criteria related to environmental sustainability, ensuring that universities align institutional governance with global sustainable development goals.

By strengthening leadership structures and aligning them with sustainability objectives, universities can enhance their contribution to environmental education and social responsibility.

8. LIMITATIONS AND FUTURE RESEARCH

Despite its contributions, this study has certain limitations. First, the research employed a cross-sectional design, which limits the ability to establish causal relationships over time. Longitudinal studies are recommended to examine how managerial leadership influences the development of environmental competencies across different academic periods.

Second, the study focused on a single public university, which may limit the generalizability of the findings to other institutional contexts. Future research could include multiple universities, both public and private, to compare leadership practices and sustainability outcomes across diverse settings.

Additionally, this study relied on self-reported data, which may be subject to social desirability bias. Future studies could complement survey data with qualitative methods, such as interviews or document analysis, to gain deeper insights into leadership practices and environmental initiatives.

Finally, future research could explore the role of specific leadership styles, such as transformational or distributed leadership, in promoting environmental competencies, as well as the impact of digital and green leadership models in higher education.

REFERENCES

Alonso-Almeida, M. M., Bagur-Femenías, L., Llach, J., & Perramon, J. (2020). Sustainability in small tourist businesses: The link between initiatives and performance. *Journal of Cleaner Production, 263*, 121379.https://doi.org/10.1016/j.jclepro.2020.121379

Bush, T. (2021). *Theories of educational leadership and management* (5th ed.). Sage Publications.https://us.sagepub.com/en-us/nam/theories-of-educational-leadership-and-management/book257983

Bush, T., & Glover, D. (2019). School leadership models: What do we know? *School Leadership & Management, 39*(1), 1–20. https://doi.org/10.1080/13632434.2018.1550713

Cebrián, G., Junyent, M., & Mulà, I. (2020). Competencies in education for sustainable development: Emerging teaching and research developments. *Sustainability, 12*(2), 579.https://doi.org/10.3390/su12020579

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.https://us.sagepub.com/en-us/nam/research-design/book255675

Hallinger, P. (2020). Bringing context out of the shadows of leadership. *Educational Management Administration & Leadership, 48*(1), 5–24. https://doi.org/10.1177/1741143216670652

Hallinger, P., & Heck, R. H. (2019). Conceptualizing school leadership effects on learning. *Educational Administration Quarterly, 55*(1), 1–33. https://doi.org/10.1177/0013161X18785875

Hernández-Sampieri, R., & Mendoza, C. (2018). *Metodología de la investigación: Las rutas cuantitativa, cualitativa y mixta*. McGraw-Hill Education.https://www.mheducation.com.mx/metodologia-de-la-investigacion-9781456272393-latam

Kopnina, H., & Meijers, F. (2019). Education for sustainable development (ESD): Exploring theoretical and practical challenges. *International Journal of Sustainability in Higher Education, 20*(1), 1–18. https://doi.org/10.1108/IJSHE-06-2018-0105

Leithwood, K., Harris, A., & Hopkins, D. (2020). Seven strong claims about successful school leadership revisited. *School Leadership & Management, 40*(1), 5–22.https://doi.org/10.1080/13632434.2019.1596077

Lozano, R., Barreiro-Gen, M., Lozano, F. J., & Sammalisto, K. (2019). Teaching sustainability in higher education: An integrative review. *International Journal of Sustainability in Higher Education, 20*(1), 1–21. https://doi.org/10.1108/IJSHE-05-2018-0082

OECD. (2020). *Education for sustainable development and global citizenship*. OECD Publishing.https://doi.org/10.1787/19939019

Sterling, S., Maxey, L., & Luna, H. (2022). *The sustainable university: Progress and prospects*. Routledge.https://doi.org/10.4324/9781003002730

UNESCO. (2021). *Education for sustainable development: A roadmap*. UNESCO Publishing.https://unesdoc.unesco.org/ark:/48223/pf0000374802

Wiek, A., Withycombe, L., & Redman, C. L. (2016). Key competencies in sustainability: A reference framework for academic program development. *Sustainability Science, 11*(2), 203–218.https://doi.org/10.1007/s11625-016-0372-2