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LEADERSHIP FOR SUSTAINABILITY: COMPETENCIES AND DEVELOPMENT PATHWAYS FOR SCHOOL PRINCIPALS

IGBINEDION, Doye Angela PhD.
Department of Education Foundations, School of Eduaction
Isaac Jasper Boro College of Education Sagbama, Bayelsa State.
ORCID: 0009-0005-1279-229X
doyeigbinedion@hotmail.co.uk.
+2348060500038.

Ogunyemi Sunday Ayo.
Ekiti state university. Ekiti state
ORCID:0009-0005-7784-0547
Ogunyemisundayayo26@gmail.com.

AYODELE, Odesanmi
University of Abuja
Odesanmi.ayodele5@gmail.
+2348130461481

Abstract

The increasing complexity of global challenges like climate change, resource depletion, biodiversity loss, inequality, and social instability has positioned schools as key institutions for cultivating sustainability-oriented knowledge, values, and actions. School principals, as central agents of school transformation, require renewed leadership competencies that move beyond managerial efficiency toward systemic, future-oriented, and ethically grounded forms of sustainability leadership. This article provides a comprehensive analysis of sustainability leadership in education by: (1) critically synthesizing global scholarship on sustainability competencies, (2) contextualizing those competencies for school principalship, and (3) proposing multilayered development pathways; pre-service, in-service, and policy/system-level supports. Drawing on a large body of evidence from educational leadership, sustainability science, and ESD (Education for Sustainable Development), the article offers an expanded competency framework for principals, encompassing systems, futures, normative, strategic, interpersonal, intrapersonal, implementation, integration, and socio-political competencies. It argues that advancing sustainability leadership requires not only individual competence but also supportive institutional cultures, collaborative structures, and enabling policies. Implications for policymakers, scholars, and professional development providers are

presented, emphasizing the need for long-term, practice-based leadership formation grounded in ethical, ecological, and equity-oriented principles.

Keywords: School Principals, Sustainable Leadership, Sustainability Competencies, Education for Sustainable Development, Professional Development, School Leadership

Introduction

Education systems worldwide face the urgent task of preparing future generations to address increasingly interconnected socio-ecological challenges. International policy frameworks, including the UN Sustainable Development Goals (SDG 4.7) and the UNESCO Roadmap for ESD, which emphasizes the transformative potential of education for sustainable development and identify school leaders as key actors for systemic change. (UNESCO, 2020). Within schools, principals serve as gatekeepers and catalysts of change. They shape institutional vision, culture, curriculum, teacher development, resource allocation, and community relationships. Consequently, leadership is a decisive factor in school improvement and student outcomes. (Leithwood et al., 2024; Hallinger, 2021). As sustainable development demands long-term thinking, ethical deliberation, community engagement, and innovative pedagogy, principals must acquire competencies aligned with sustainability's complexity. Leadership for sustainability is fundamentally different from traditional instructional or managerial leadership. It requires an orientation toward equity, ecological integrity, long-term stewardship, and systemic interdependence. (Hargreaves & Fink, 2022; Fullan, 2024; Sterling, 2020) Sustainability leadership is not simply implementing green initiatives, it represents a deeper commitment to cultivating resilient, just, and future-oriented learning ecosystems. This article expands conceptual clarity on sustainability competencies for school leaders and identifies pathways to develop them. It integrates cross-disciplinary scholarship from sustainability science, global leadership studies, and ESD to produce a robust model suitable for empirical testing and policy adoption.

Literature Review and Conceptual Foundations

Sustainable leadership in education has evolved over the past two decades as scholars observed that school improvement efforts were often inconsistent, short-lived, and overly dependent on the charisma or personal drive of individual leaders. Early reform movements tended to rise and fall with leadership turnover, revealing a systemic weakness in the ability of schools to maintain progress over time. In response, educational thinkers such as Hargreaves and Fink (2022) articulated the concept of sustainable leadership as an approach that ensures improvement is meaningful, enduring, and widely shared across the institution. Sustainable leadership is built upon several interrelated dimensions. It emphasises *depth*, meaning that improvement must focus on the core of teaching and learning rather than superficial administrative gains. It prioritises *length*, ensuring that progress is preserved even during leadership transitions so that the school's vision outlasts the leader's tenure. Its focus on *breadth* underscores the importance of distributed leadership, where responsibility and capacity

are shared among teachers, teams, and other stakeholders to prevent burnout and cultivate collective ownership. The dimension of *justice* highlights the moral imperative to ensure equitable learning opportunities for all learners. *Diversity* recognises the value of plural perspectives, inclusive practices, and context-sensitive solutions, while *resourcefulness* calls for careful stewardship, renewal of resources, and development of organisational resilience. Together, these dimensions extend the moral purpose of school leadership beyond the internal operations of a school toward a broader ecological, social, and societal mandate (Fullan, 2024; Harris, 2024).

According to Obizue, Abu, Agba & Babatunde (2025).), Education for Sustainable Development (ESD) further deepens this perspective by positioning education as a transformative force for ecological integrity, social justice, and economic sustainability. ESD literature highlights the competencies and dispositions required for individuals and institutions to actively contribute to sustainable futures (UNESCO, 2020; Rieckmann, 2021). For school leaders, this translates into embedding sustainability principles within the curriculum, fostering inquiry-based and participatory learning, and creating governance structures that empower teachers, students, and community stakeholders. Effective ESD leadership also involves modelling sustainable organisational practices such as energy conservation, recycling initiatives, and responsible resource use while encouraging teacher innovation and cross-sector collaboration. Scholars emphasize that leadership for ESD demands socio-political awareness, critical thinking, ethical reasoning, and the ability to navigate complex trade-offs and competing interests (Tilbury, 2022; Barth et al., 2020). Within this scholarly context, sustainability competency models provide a structured way to articulate the capabilities required of leaders who wish to promote long-term educational transformation. Wiek and colleagues (2021), introduced a widely cited framework that identifies five core competencies essential to sustainability-oriented action: systems thinking (understanding complex interrelations), anticipatory competence (envisioning possible futures), normative competence (evaluating values and sustainability principles), strategic competence (designing and implementing interventions), and interpersonal competence (collaborative and communication skills). Building on this framework, later scholars expanded the landscape of sustainability competencies to include intrapersonal competence, encompassing self-awareness, emotional resilience, and reflective capacity as well as implementation competence, integration competence, critical thinking competence, and socio-political competence, which involves the ability to engage effectively with policy, governance systems, and societal structures (Redman & Wiek, 2021; Rieckmann, 2021; Lozano et al., 2023). These evolving competency models collectively offer the conceptual foundation for the expanded principalship competency framework developed in this article. They demonstrate that sustainable educational leadership is not merely an administrative function but a multidimensional capacity that integrates ethical reasoning, strategic foresight, institutional resilience, collaborative relationships, and transformative action.

A Comprehensive Framework of Sustainability Competencies for Educational Leaders

Sustainability leadership in education requires a multifaceted set of competencies that enable principals to navigate complexity, foster inclusive change, and align school operations with long-term ecological and social goals. Contemporary research highlights that effective principals must integrate cognitive, ethical, strategic, and interpersonal capabilities to drive transformative sustainability initiatives. The expanded competency framework presented here builds upon established sustainability models and adapts them to the realities of school leadership in diverse educational contexts. **Systems-thinking competence** forms the foundation of sustainability-focused leadership. It equips principals with the ability to recognize the interconnectedness of school subsystems curriculum design, infrastructure development, teacher professional learning, community relations, and wider socio-environmental influences. Through a systems-oriented lens, principals diagnose structural challenges, identify root causes rather than symptoms, and pinpoint leverage points where targeted interventions can create meaningful change. This competence encourages holistic planning and preventative problem-solving, enabling schools to anticipate unintended consequences and maintain coherence across activities. Research demonstrates that schools led by systems-thinking-oriented principals tend to integrate sustainability more effectively, foster cross-disciplinary collaboration, and cultivate cultures of continuous improvement (Senge, 2025; Cebrián & Junyent, 2015).

According to Obizue, Chukwuemeka & Iwezu (2025)), **futures or anticipatory competence** enables principals to envision long-term trajectories, develop scenarios, and prepare the school community for emerging risks and opportunities. In the context of climate change, technological disruption, and evolving societal expectations, principals must be capable of navigating uncertainty and strategic ambiguity. This competence supports the design of resilient infrastructure plans, encourages futures literacy among teachers and students, and promotes innovation in teaching and learning. Principals who cultivate anticipatory competence proactively adapt policies, instructional practices, and school cultures to ensure long-term relevance and sustainability (Rieckmann, 2021).

Normative or values competence sits at the moral core of sustainability leadership. It involves the ability to make ethical judgments, weigh competing priorities, and anchor decision-making in principles of justice, equity, and environmental responsibility. Principals use normative competence to articulate sustainability as a moral imperative rather than an optional add-on, framing it in terms of student wellbeing, community responsibility, and intergenerational fairness. This competence guides leaders in resolving value conflicts, promoting inclusive practices, and fostering a shared ethical vision that supports transformational change (Tilbury, 2022).

Strategic or action competence bridges the gap between vision and implementation. It involves the capacity to design coherent plans, mobilize resources, manage change processes, and sustain momentum over time. Strategically competent principals monitor progress,

evaluate impact, and adjust actions based on evidence and feedback. They are skilled in securing support from community stakeholders, aligning resources with priorities, and embedding sustainability into school routines and structures. Empirical studies show that schools with strong strategic leadership maintain robust ESD programmes and achieve enduring outcomes (Wiek et al., 2021; Barth et al., 2020). **Interpersonal and collaborative competence** underscores the relational nature of sustainability transformation. Principals must be able to build trusting relationships, navigate conflict constructively, motivate teachers, engage parents, and collaborate with governmental and non-governmental partners. Effective collaboration fosters shared responsibility, enhances communication, and supports teacher creativity and commitment. Schools led by collaborative principals tend to exhibit stronger professional cultures, higher levels of innovation, and deeper integration of sustainability in teaching and learning (Harris, 2024; Day et al., 2016).

Intrapersonal and reflective competence focuses on the internal capacities of the leader. Sustainability work often entails navigating setbacks, managing resistance, and sustaining long-term commitment. Principals therefore require emotional resilience, self-awareness, reflective practice, and ethical courage. This competence supports leaders in managing stress, preventing burnout, and maintaining clarity of purpose in the face of complex demands. Reflective principals are more effective at learning from experience and modelling integrity for their school communities (Lozano et al., 2023).

Implementation competence emphasizes the practical ability to translate sustainability policies and plans into concrete actions. This involves organizing waste reduction programmes, overseeing green procurement practices, redesigning curriculum units to include sustainability themes, and implementing energy management initiatives. Principals with strong implementation competence ensure that sustainability is embedded in daily school operations and becomes visible to staff, students, and the broader community (Redman & Wiek, 2021).

Integration competence refers to the ability to weave sustainability principles across all dimensions of school life. It requires aligning curriculum, pedagogy, infrastructure, budgeting processes, teacher professional development, and community engagement around shared sustainability goals. Integration competence is commonly seen as the central driver of whole-school sustainability transformation, ensuring coherence and reinforcing a unified direction for development (Sterling, 2020).

Socio-political and change agency competence prepares principals to navigate external governance structures, engage with policy frameworks, and advocate effectively for sustainability reforms. This competence empowers leaders to work within bureaucratic systems, influence decision-making, secure policy support, and mobilise diverse stakeholders. Principals who demonstrate strong socio-political competence are better positioned to push for systemic change and ensure that sustainability becomes institutionalized rather than dependent on individual effort (Barth et al., 2020).

Why These Competencies Are Essential: Evidence from Global Research

A growing body of empirical research underscores the critical role of leadership in shaping school outcomes, institutional culture, and sustainability transformation. Studies consistently show that leadership accounts for up to 25 percent of school-level variation in student achievement, making it the second most influential school factor after classroom teaching (Leithwood et al., 2024). Sustainable leadership contributes significantly to teacher retention, collective efficacy, organizational learning, and school resilience (Day et al., 2016). Schools guided by sustainability-oriented principals also tend to embed environmental literacy, social justice education, and student agency more deeply and effectively across curricular and extracurricular programmes (Özkan, 2022; Semin, 2019). Moreover, principals' sustainability competencies correlate with whole-school sustainability certifications, reductions in ecological footprints, and improvements in student behaviour, engagement, and wellbeing (Cebrián & Junyent, 2015).

Development Pathways for Principals

Professional preparation for sustainability leadership requires a coherent developmental ecosystem spanning pre-service education, in-service training, and system-level supports. These pathways ensure that principals build and continually refine the competencies needed to lead transformative sustainability initiatives (Obizue, Enomah & Onyebu, 2025).

Pre-service leadership preparation plays a foundational role in shaping future principals' understanding of sustainability issues. Integrating sustainability-focused courses into leadership degree programmes, facilitating field-based learning through community sustainability partnerships, and using case-based learning centred on environmental justice and climate adaptation help developing leaders acquire key competencies before entering administrative roles. Research indicates that experiential learning approaches significantly enhance the acquisition and retention of sustainability competencies (Barth et al., 2020).

In-service capacity building reinforces and extends these skills throughout principals' careers. Cohort-based professional development, peer mentoring, and leadership coaching are particularly effective in strengthening reflective, strategic, and collaborative competencies (Day et al., 2016). Whole-school action research cycles provide authentic opportunities for principals to practice systems thinking, implementation, and integration competencies in real school settings. Professional Learning Communities (PLCs) further support continuous improvement, foster teacher innovation, and break down silos that hinder ESD integration (Hargreaves & Fink, 2022).

System-level supports are essential for sustaining leadership development. These include embedding sustainability in leadership standards, evaluation frameworks, and certification requirements; allocating dedicated funding, time, and technical assistance; and promoting district-level sustainability networks that enable shared learning and collaboration across schools (UNESCO, 2020). Without supportive infrastructure, even the most committed principals may struggle to effect lasting change.

Tools and assessment mechanisms offer structured ways to evaluate and strengthen principals' competencies. Competency-based rubrics help clarify expectations and guide professional reflection. Sustainability portfolios enable principals to document their strategies, actions, and outcomes over time. Longitudinal school impact assessments help leaders track progress, identify trends, and refine implementation strategies. Together, these tools reinforce accountability, transparency, and continuous learning.

Implementation Model for School Systems

Implementing sustainability leadership within school systems requires a structured, iterative, and participatory process that embeds new practices into the culture and operations of the institution. A comprehensive implementation model typically begins with **visioning and awareness-building**, during which school leaders initiate conversations through workshops, stakeholder dialogues, and collaborative planning forums. This stage cultivates a shared understanding of sustainability principles and generates collective motivation for change.

Following this, schools often begin with a **pilot phase**, introducing small-scale innovations such as energy-saving initiatives, waste-reduction programmes, or exploratory curriculum modules focused on environmental literacy and social responsibility. These pilot activities allow principals and teachers to experiment, learn, and adapt strategies in low-risk contexts before committing to full-scale reform.

The next stage involves **scaling and integration**, in which successful practices are systematically expanded across the school. This includes embedding sustainability into school policies, professional development programmes, curriculum design, and teaching practices. At this point, sustainability becomes more visible, structured, and interconnected within school systems. The final stage is **institutionalisation**, where sustainability leadership is sustained beyond individual initiatives or particular principals. Institutionalisation requires the development of distributed leadership structures, succession planning, and clear accountability mechanisms to ensure continuity. At this level, sustainability becomes part of the school's identity and long-term strategic direction, reinforced through supportive policies and organizational routines.

Research Gaps and Future Directions

Despite the growing interest in sustainability leadership, several gaps remain in the literature. One pressing need is the development of **validated instruments** capable of reliably measuring principals' sustainability competencies across diverse contexts. Much of the current research relies on qualitative or self-reported data, limiting comparability and empirical precision. Another gap concerns the **lack of longitudinal studies** tracing how principal competencies influence measurable ecological, social, and educational outcomes over time. Long-term data are crucial for understanding causality and identifying which leadership practices produce sustained improvements in school sustainability. Geographically, the field remains dominated by research from Europe, North America, and parts of Oceania. There is a notable **shortage of studies conducted in African, Southeast Asian, and Middle Eastern contexts**, regions

where cultural, economic, and political conditions may shape unique sustainability leadership challenges and opportunities. Finally, there is a need for **comparative research** examining how policy ecosystems, institutional structures, and governance frameworks enable or constrain sustainability leadership. Cross-national or cross-regional comparisons would offer deeper insights into the systemic factors that shape effective sustainability practice in schools.

Conclusion

School principals occupy a central position in advancing sustainability within education systems. Their leadership influences not only school culture and instructional practice but also students' capacity to navigate a rapidly changing world shaped by environmental uncertainty, social inequality, and technological transformation. Achieving genuine sustainability outcomes requires a holistic constellation of competencies with cognitive, ethical, interpersonal, intrapersonal, strategic, and socio-political working together synergistically. These competencies do not develop automatically; they must be cultivated through intentional leadership preparation, ongoing professional development, mentoring structures, and supportive policy environments. System-level alignment is essential to ensuring that sustainability leadership becomes embedded in institutional routines rather than dependent on individual commitment alone. Ultimately, sustainable leadership is not an optional enhancement but a foundational pillar of contemporary education. It positions schools to contribute meaningfully to ecological stewardship, social justice, and long-term community resilience, thereby preparing learners to thrive in and contribute to a sustainable future.

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