MANAGERE: Indonesian Journal of Educational Management
Vol. 8 No. 2 (2026), p. 142-157
Available online at https://serambi.org/index.php/managere

Cultivating Sustainability: Principal Leadership Perspectives on School Food Gardens in South Africa

Kathija Yassim*, Mukateko Louisa Sithole
University of Johannesburg, South Africa

DOI: https://doi.org/10.52627/managere.v8i2.2149

Article History:
Received: 09 January 2026
Revised: 28 March 2026
Accepted: 18 May 2026

Keywords:
Education for Sustainability, School Food Gardens, Instructional Leadership, Third Learning Spaces

**Correspondence Address:*
mukatekosithole@gmail.com

Abstract:
School food gardens are increasingly recognized as valuable contexts for Education for Sustainability (EfS), yet limited research has examined the leadership practices that enable their pedagogical integration. This study explored how primary school principals perceive and utilize food gardens as third learning spaces that support sustainability-oriented education. A qualitative case study design within an interpretive paradigm was employed. Data were collected through semi-structured interviews with six primary school principals whose schools had established food gardens embedded in teaching and learning programs. Data were analyzed using Tesch's eight-step coding procedure. Findings indicate that school food gardens extend beyond food production and nutrition support, functioning as experiential learning environments that foster teacher professional learning, enhance learner self-efficacy, and promote sustainability literacy. Principals played a central role in enabling these outcomes by articulating a shared vision, safeguarding instructional time, facilitating professional development, and building collaborative networks among teachers, learners, families, and community stakeholders. The study shows that the effectiveness of school food gardens depends not only on their physical presence but also on leadership processes that integrate them into the school's pedagogical mission. The implications suggest that educational leadership programs should strengthen principals' instructional leadership skills to integrate sustainability initiatives into curriculum practice better. Education authorities are encouraged to institutionalize school food gardens as structured learning infrastructure, supported by teacher training, community engagement, and protected instructional time, to ensure sustained educational impact.

INTRODUCTION

Contemporary societies are confronted with increasingly complex sustainability challenges, including climate change, biodiversity loss, environmental degradation, food insecurity, and widening social inequalities. Addressing these interconnected challenges requires more than technological solutions or policy interventions. It demands educational approaches that enable learners to develop the knowledge, values, skills, and dispositions necessary to participate in sustainable futures. Education for Sustainability (EfS) has consequently emerged as a significant educational response to these challenges, emphasizing the development of critical thinking, environmental responsibility, systems thinking, and active citizenship (Peretz, 2025; Reffhaug & Lysgaard, 2024). Although sustainability has become a prominent educational priority across many countries, translating sustainability principles into meaningful everyday learning experiences remains a persistent challenge. Sustainability is frequently addressed through curriculum

content, yet opportunities for learners to engage directly with sustainability-related issues through authentic and experiential learning remain unevenly distributed across schools.

The growing recognition of this challenge has prompted educators and policymakers to explore learning environments that extend beyond the traditional classroom. School food gardens have increasingly attracted attention as educational spaces capable of connecting curriculum objectives with real-world experiences. Unlike conventional classroom settings, gardens provide learners with opportunities to engage directly with ecological processes, food production systems, environmental stewardship, and community participation. Through activities such as planting, cultivating, harvesting, composting, and resource management, learners encounter sustainability not as an abstract concept but as a lived experience embedded within their everyday educational practices. Such experiences align closely with the aspirations of EfS, which seeks to move beyond knowledge acquisition towards the development of practical competencies, ethical awareness, and sustainable behaviours. School food gardens therefore represent a potentially powerful educational resource for bridging the gap between theoretical learning and practical engagement with sustainability challenges.

Interest in school food gardens has expanded considerably over the past decade. Research has demonstrated their contribution to environmental literacy, learner engagement, healthy eating practices, social development, and experiential learning (Algurén, 2025; Prasetyo et al., 2024; Silva, 2025; Varman et al., 2021). Gardens have also been associated with improvements in food security, community participation, and learners' understanding of ecological systems (Dominguez-Hernandez et al., 2022; Holloway et al., 2023; Huq & Deacon, 2025; Nontu et al., 2024). Beyond these educational and social benefits, school food gardens create opportunities for interdisciplinary learning by integrating concepts from science, mathematics, languages, environmental studies, and social sciences within authentic contexts. Such learning environments enable learners to establish meaningful connections between classroom content and everyday life, thereby strengthening both academic understanding and practical competence. These findings have contributed significantly to the growing recognition of school gardens as valuable educational resources within sustainability-oriented education.

Despite these advances, an important imbalance remains evident within the existing literature. Much of the current scholarship focuses on learner outcomes, environmental awareness, food security, curriculum integration, or the educational benefits of garden-based learning. Comparatively less attention has been devoted to understanding the leadership processes that enable school food gardens to function as sustainable educational initiatives. While gardens may offer substantial educational potential, their successful implementation rarely occurs spontaneously. Transforming a garden into a meaningful learning environment requires vision, coordination, curriculum alignment, teacher support, stakeholder collaboration, and sustained institutional commitment. These processes are often shaped by school leaders, yet the role of principals in creating and sustaining the conditions necessary for garden-based learning remains insufficiently understood. As a result, existing knowledge provides only a partial understanding of how school food gardens become embedded within school culture and educational practice.

This gap is particularly significant because school principals occupy a central position in shaping educational innovation and organisational change. Educational leadership research consistently highlights the influence of principals in establishing

school vision, supporting teacher development, fostering collaborative cultures, and creating conditions that enhance teaching and learning (Brauckmann et al., 2023; He et al., 2024; Wang'ombe, 2023). Similar patterns have emerged within Education for Sustainability, where leadership has been identified as a critical factor in promoting sustainability-oriented practices across schools (Boeske, 2023; Eustachio et al., 2024; Nguyen, 2025). Nevertheless, limited research has explored how principals conceptualise and utilise school food gardens as educational spaces that advance sustainability learning. Existing studies conducted in Canada, Spain, and Kenya have highlighted the value of school gardens and the importance of leadership support (Huambachano et al., 2022; Kanosvamhira, 2025; Kempler et al., 2025). However, leadership remains largely positioned as a supporting variable rather than the primary focus of investigation. Consequently, little is known about how principals navigate the organisational, pedagogical, and collaborative dimensions involved in transforming school food gardens into sustained learning environments.

The novelty of this study lies in its integration of instructional leadership theory with third-space learning and sustainability education within the specific context of school food gardens. Unlike prior studies that treat these domains separately, this research empirically demonstrates their interdependence, showing that sustainability outcomes emerge from the interaction between leadership practices, teacher capacity, learner agency, and community collaboration. This integrated model contributes a new conceptual understanding of school food gardens as "leader-mediated third learning ecosystems," offering a framework that can be applied in future empirical research across diverse educational contexts. The overall impact of the study lies in repositioning school food gardens from peripheral educational projects to strategically governed learning infrastructures that actively shape sustainability competencies, institutional culture, and community engagement in a systemic and scalable manner.

The study is guided by the Whole School Approach (WSA), Hallinger's instructional leadership model, and Third Space Learning Theory. Together, these frameworks provide a conceptual lens for examining how leadership practices support the integration of school food gardens into teaching and learning processes. The Whole School Approach emphasises the importance of systemic alignment and stakeholder involvement in advancing sustainability initiatives (Hoang et al., 2025; Holst, 2023). Hallinger's instructional leadership model highlights the role of principals in shaping learning environments through vision building, curriculum management, and the creation of positive school climates (Liu & Hallinger, 2024; Shaked & Hallinger, 2026). Third Space Learning Theory provides a framework for understanding gardens as hybrid learning environments where formal curriculum intersects with community knowledge, lived experiences, and ecological practices (Mettis & Väljataga, 2021; Teoule, 2025). The integration of these perspectives enables a richer exploration of how leadership contributes to the educational use of school food gardens.

Against this backdrop, this study explores the perspectives of six primary school principals in the Tshwane School District of South Africa regarding the use of school food gardens as third learning spaces for Education for Sustainability. Two research questions guided the investigation: (1) How do principals perceive the role of school food gardens in advancing Education for Sustainability? and (2) What leadership strategies do principals employ to incorporate school food gardens as third learning spaces? By

foregrounding the experiences and perspectives of school leaders, this study contributes to a growing body of scholarship on sustainability education, instructional leadership, and alternative learning environments. More specifically, it offers insight into how leadership practices enable school food gardens to evolve from food production initiatives into dynamic educational spaces that support sustainability-oriented learning, learner development, and community engagement.

RESEARCH METHODS

This study adopted a qualitative case study design within an interpretive research paradigm to explore how school principals perceive and utilise school food gardens as third learning spaces for advancing Education for Sustainability (EfS) (Gretschel et al., 2023; Mtisi, 2022). A qualitative approach was considered appropriate because the study sought to understand leadership experiences, meanings, and practices that cannot be adequately captured through quantitative measures. The case study design enabled an in-depth examination of a contemporary educational phenomenon situated within its real-life context, allowing for a nuanced understanding of how school food gardens are integrated into teaching and learning processes. Particular attention was given to the ways in which principals shaped vision, instructional practices, and stakeholder participation in relation to garden-based learning. The interpretive orientation of the study provided a framework for understanding how participants constructed meaning from their experiences and how those meanings influenced leadership decisions and educational practices within their respective school environments.

Participants were selected through purposive sampling because they possessed direct experience in leading schools where food gardens were actively used for educational purposes (Ahmad & Wilkins, 2025; Tajik et al., 2025). Six primary school principals participated in the study. Their schools had established food gardens that were integrated into teaching and learning activities, making them well positioned to provide rich and relevant insights into the phenomenon under investigation. Data were generated through semi-structured interviews conducted over a period of approximately three months. Each interview lasted between 30 and 40 minutes and provided opportunities for participants to reflect on leadership practices, instructional strategies, and experiences related to the educational use of school food gardens. The semi-structured format allowed key issues to be explored consistently across participants while retaining sufficient flexibility to pursue emerging themes and unique perspectives. Interviews were audio-recorded with participants' consent and subsequently transcribed verbatim to preserve the authenticity and depth of the data.

Table 1. Research Participants

Participant	Rationale for Inclusion
Principal 1	Principal of a primary school with an established food garden used to support teaching and learning activities.
Principal 2	Principal with direct experience in integrating school food gardens into educational programmes and sustainability initiatives.
Principal 3	Principal actively involved in managing school food garden activities and stakeholder engagement.
Principal 4	Principal with experience supporting teacher participation in garden-based learning activities.
Principal 5	Principal responsible for overseeing the educational implementation of school food garden programmes.
Principal 6	Principal with extensive involvement in coordinating school food gardens as learning spaces.

Data analysis followed Tesch's eight-step coding process as outlined by Creswell and Creswell (2023). The analytical process began with repeated reading of interview transcripts to gain familiarity with the data and identify initial meanings. Significant statements and recurring ideas were then coded and grouped into broader categories based on conceptual similarities. Through an iterative process of comparison and refinement, categories were consolidated into themes that captured shared patterns across participants' experiences. Continuous movement between individual transcripts and emerging themes enabled the researchers to maintain a close connection to participants' perspectives while developing a coherent interpretation of the data. The analysis ultimately resulted in five interconnected themes concerning professional development, learner self-efficacy, visionary leadership, instructional time, and collaborative learning communities. These themes formed the basis for understanding how school food gardens functioned as third learning spaces that support sustainability-oriented education.

RESULTS AND DISCUSSION

Results

The Role of Professional Development in Advancing Outdoor and Experiential Learning

Professional development emerged as a central component in the successful implementation of school food gardens as learning spaces. Across all participating schools, principals consistently emphasized that the transition from conventional classroom instruction to outdoor and experiential learning required teachers to acquire new knowledge, skills, and instructional approaches. The findings revealed that many teachers had limited experience in outdoor teaching and lacked confidence in integrating gardening activities into the curriculum. Consequently, principals viewed professional development as a strategic mechanism for strengthening teacher capacity and ensuring the effective use of school gardens for teaching and learning. Professional development was not perceived as a once-off intervention but rather as a continuous process embedded within the school environment. Participants highlighted various forms of learning opportunities, including workshops, peer collaboration, mentoring, and informal knowledge-sharing activities, all of which contributed to teachers' readiness to facilitate meaningful learning experiences within the garden setting.

The findings revealed that principals regarded teacher development as a prerequisite for the effective use of school food gardens as educational spaces. Participants consistently reported that many teachers had not received formal preparation for outdoor instruction and therefore required additional support to adapt their teaching practices. This situation prompted school leaders to prioritize professional learning opportunities that could strengthen teachers' competence and confidence in facilitating garden-based learning activities. Principal 2 explained: "Teachers were never trained in outdoor teaching and learning, and some of them did not even do gardening. Their professional development should be prioritised." This concern was echoed by Principal 4, who emphasized the importance of continuous teacher growth in ensuring the success of school garden initiatives: "Teacher development is crucial for the success of garden-based learning."

Similarly, Principal 1 highlighted the changing demands placed on teachers when learning activities move beyond the classroom environment: "Extending learning to the garden requires teachers to broaden their knowledge and refine their practices for

interactive learning." The participants further indicated that teacher learning should extend beyond formal training sessions and become part of an ongoing professional culture within schools. Several principals described how teachers were encouraged to participate in workshops, collaborative planning sessions, mentoring activities, and self-directed learning opportunities to improve their ability to facilitate outdoor learning.

Principal 5 stated: "Both formal workshop seminars and informal online course peer-learning opportunities expand teachers' knowledge and pedagogical skills, allowing teachers to pursue growth according to their needs and fostering self-directed learning." In addition, principals emphasized the value of collaboration among teachers as a mechanism for professional growth. They explained that opportunities for sharing experiences and discussing challenges enabled teachers to learn from one another and develop practical solutions for implementing garden-based learning. Principal 6 remarked: "Creating spaces for teachers to share ideas in a job-embedded context helps both professional learning communities and collective problem-solving."

The interview findings indicate that principals perceived teacher capacity as a determining factor in the successful implementation of outdoor and experiential learning. Across all participating schools, professional development was consistently described as an essential support mechanism that enabled teachers to adapt to new instructional environments and responsibilities. Participants acknowledged that many teachers entered garden-based learning initiatives with limited experience in outdoor instruction, creating a need for structured opportunities to develop both pedagogical and practical competencies. The findings further show that principals associated professional development with increased teacher confidence and willingness to engage in innovative teaching practices. Rather than viewing teacher learning as a short-term intervention, participants emphasized its continuous nature and its role in sustaining instructional improvement.

The interviews also revealed a strong emphasis on collaborative learning, where teachers shared experiences, reflected on challenges, and collectively developed strategies for implementing garden-based activities. Another important pattern emerging from the data is the active role of principals in facilitating professional growth. Participants did not merely encourage teacher development but also created conditions that enabled learning to occur through workshops, mentoring, peer collaboration, and ongoing support. These efforts demonstrate that school leaders considered teacher learning to be a critical component in ensuring the effectiveness and sustainability of garden-based educational practices. Drawing from the findings above, several professional development practices were identified as important mechanisms for strengthening teachers' capacity to implement outdoor and experiential learning through school food gardens. These practices and their reported outcomes presented in Table 2.

Table 2. Professional Development Practices Supporting Outdoor and Experiential Learning

Professional Development Practice	Focus of Development	Reported Outcomes in Garden-Based Learning
Workshops on outdoor pedagogy	Strengthening instructional approaches for learning outside the classroom	Teachers became more confident in facilitating learning activities in the garden environment
Training on gardening techniques	Developing practical knowledge of planting, maintenance, and harvesting activities	Teachers were better prepared to guide learners in hands-on gardening activities
Peer-learning and idea-sharing sessions	Exchanging experiences and addressing implementation challenges	Increased collaboration and sharing of effective teaching practices among teachers

Mentoring and on-site guidance	Providing continuous support during the implementation process	Teachers demonstrated greater readiness to integrate garden activities into lessons
Collaborative lesson planning	Aligning garden activities with curriculum requirements	Improved integration of garden-based activities into classroom teaching and learning
Self-directed and online learning opportunities	Expanding access to professional learning resources	Teachers independently explored new strategies and learning materials relevant to outdoor education

Source: Developed from interview and field findings (Researcher's analysis, 2026)

Table 2 indicates that professional development for teachers in school garden-based learning occurs through multiple complementary strategies that collectively strengthen pedagogical capacity and curriculum integration. Workshops on outdoor pedagogy enhance teachers' confidence in facilitating learning beyond the classroom, while practical gardening training equips them with essential skills in planting, maintenance, and harvesting. Peer learning and collaborative discussions promote the exchange of experiences and improve collective problem-solving, thereby leading to stronger instructional practices. Mentoring and on-site support further reinforce implementation by providing continuous guidance during lesson delivery. Collaborative lesson planning ensures alignment between garden activities and curriculum objectives, thereby improving instructional coherence. In addition, self-directed and online learning expands teachers' access to professional resources and supports ongoing pedagogical innovation. Overall, these development practices contribute to greater teacher competence, stronger collaboration, and more effective integration of school gardens into teaching and learning.

Valuing the Development of Self-Efficacy in Learners

The findings revealed that principals regarded the development of learner self-efficacy as one of the most significant outcomes of using school food gardens as learning spaces. Participants consistently described how learners gained confidence, responsibility, and independence through active involvement in gardening activities. Rather than merely acquiring agricultural knowledge, learners were exposed to practical experiences that enabled them to apply skills, solve problems, and evaluate the outcomes of their actions. Principals observed that learners developed a sense of ownership over their work as they participated in planting, maintaining, and harvesting crops. These experiences encouraged learners to recognize the relationship between effort and outcomes while fostering accountability for both successes and failures. The findings further suggest that repeated participation in garden-based activities contributed to the development of perseverance, confidence, and problem-solving abilities, all of which principals viewed as important characteristics that support learners' personal growth and engagement in learning.

Participants explained that learners became more motivated when they were actively involved in practical activities and could witness the outcomes of their efforts. Principals described how the garden environment provided opportunities for learners to acquire new skills while developing confidence in their ability to complete meaningful tasks. Principal 2 reflected on the value of these experiences: "It is rewarding when learners discuss their activities in the school food garden and how they apply these skills at home." The principal further described an example of learner achievement: "The

learner's success in growing spinach from seeds to harvest and sharing it with her family exemplifies the development of valuable life skills and a sense of achievement in the learner." These experiences were viewed as important indicators of learners' growing confidence and ability to apply knowledge beyond the school environment. Similarly, Principal 5 highlighted how participation in garden activities encouraged learners to take ownership of their learning experiences. According to the principal, learners demonstrated maturity when reflecting on unsuccessful outcomes and showed a willingness to improve future performance. Principal 5 stated: "I was pleased to hear that instead of blaming others, they took responsibility for not effectively nurturing their plot. They could explain why things did not go well and were ready to apply alternatives for the next round, which should be applauded."

The findings further indicated that learners frequently worked in groups, allowing them to collaborate while sharing responsibilities for different gardening tasks. In several schools, learners were assigned specific garden plots and expected to monitor their crops' progress over time. This arrangement created opportunities for learners to observe the results of their efforts directly and develop a sense of ownership over their work. Evidence from the school sites also showed that learners openly discussed both successful and unsuccessful gardening outcomes. When crops grew successfully, learners expressed pride in their achievements and shared their experiences with teachers and peers. Conversely, when challenges occurred, learners demonstrated a willingness to reflect on possible causes and identify improvements for future planting cycles. These experiences contributed to learners' development of confidence, responsibility, and perseverance. The pattern identified across participating schools is illustrated in Figure 1.

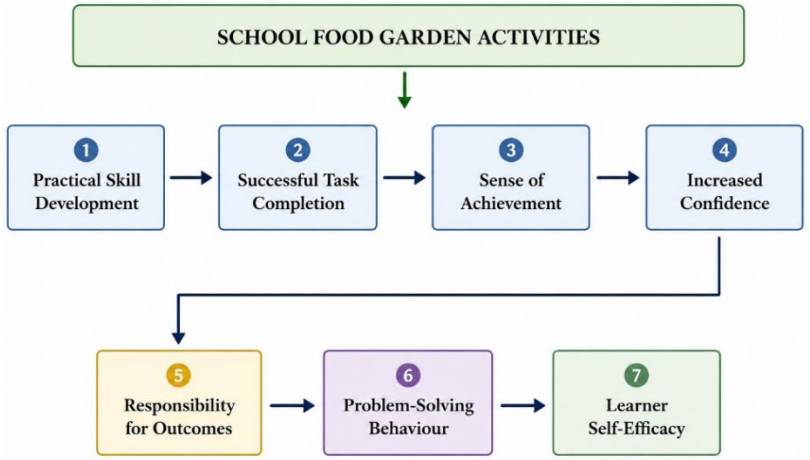

Figure 1. Development of Learner Self-Efficacy through School Food Garden Activities
Source: Developed from interview and field findings (Researcher's analysis, 2026)

Figure 1 shows that school food gardens significantly contributed to the development of learner self-efficacy. Principals consistently reported that learners gained confidence through active participation in gardening activities and through experiencing the outcomes of their efforts. The interviews highlighted the importance of achievement, responsibility, and reflection in shaping learners' perceptions of their capabilities. Field findings further revealed that learners engaged in tasks requiring commitment, accountability, and problem-solving, while also learning to evaluate successful and unsuccessful outcomes. A notable pattern emerging from the data is that self-efficacy developed not only through success but also through learners' ability to reflect on challenges and identify ways to improve future performance. Collectively, the findings

suggest that school food gardens provided meaningful opportunities for learners to strengthen confidence, resilience, responsibility, and problem-solving abilities, contributing to positive learning behaviors and greater self-belief.

Visionary Leadership and the Positioning of Gardens as Third Learning Spaces

The findings revealed that principals played a central role in positioning school food gardens as important learning spaces within their schools. Participants consistently emphasized that the successful integration of gardens into teaching and learning activities depended on a clear, shared vision among teachers, learners, and other stakeholders. Principals viewed the gardens not merely as food-production sites but also as educational spaces that could support broader learning objectives. Through strategic planning, communication, and stakeholder involvement, principals created conditions that enabled gardens to become part of the school's learning culture.

Participants highlighted the importance of establishing a clear direction for the school food garden programme. Principals explained that a shared vision helped teachers understand the educational purpose of the gardens and encouraged collective participation in achieving common goals. Principal 5 explained: "A principal's vision is a mental image of the school that the principal wants to create, which must be translated into strategic actions." Similarly, Principal 2 emphasized the importance of involving staff during the planning process: "This approach clarifies expectations and builds trust among staff." The findings further revealed that communication played an important role in translating vision into practice. Principals reported that when staff members clearly understood the purpose of garden-based learning, they were more willing to participate in planning and implementation activities. Principal 1 stated: "When principals communicate a clear direction, staff better understand their roles and engage in improving the school."

Evidence from the school sites showed that regular meetings, planning discussions, and collaborative decision-making processes were used to coordinate garden activities. Teachers were assigned responsibilities related to garden management, learner participation, and instructional integration. In several schools, stakeholders from the surrounding community also contributed to garden development and maintenance, reflecting the broader support generated through the principals' vision. The findings demonstrate that visionary leadership was fundamental in positioning school food gardens as meaningful learning spaces. Principals provided direction through vision setting, collaborative planning, and ongoing communication with teachers and stakeholders. The data indicate that a clearly articulated vision encouraged participation, strengthened collective commitment, and supported the integration of garden activities into school programs. Through these leadership practices, principals transformed school gardens from supplementary projects into recognized educational spaces that supported teaching and learning.

Protecting Instructional Time

The findings revealed that principals regarded instructional time as a valuable resource that should be carefully managed to ensure meaningful learning experiences in school food gardens. Participants consistently emphasized that garden-based activities should not be viewed as recreational or free-time exercises, but rather as structured

learning opportunities directly linked to curriculum objectives. Principals highlighted the importance of planning, scheduling, and coordinating learning activities to ensure that time spent in the garden contributed to educational outcomes. The findings further indicate that effective use of school food gardens required deliberate integration of garden activities into classroom instruction, allowing learners to connect practical experiences with academic content.

The interviews revealed a shared understanding among principals that garden-based learning should be treated as an extension of formal teaching and learning rather than an activity separate from the curriculum. Participants stressed the importance of maintaining clear learning objectives whenever learners engaged in garden activities. Principal 3 emphasized: "Taking learners to gardens is not free." This statement reflected the belief that meaningful learning in the garden requires careful preparation and purposeful instructional planning. Similarly, Principal 1 explained how garden activities were integrated into different learning areas: "The curriculum is not changed, but learners are exposed to gardens. The language teacher would use nouns of things found in the garden and the verbs of activities done there."

The interviews further revealed that teachers were expected to align garden activities with curriculum goals while ensuring that learning outcomes remained the primary focus. Principals noted that this approach enabled learners to apply classroom knowledge within authentic learning contexts while maintaining academic rigor. In several schools, principals coordinated schedules to ensure that garden-based learning activities did not interfere with core teaching responsibilities. Teachers reported that additional preparation was often required to align garden activities with lesson objectives and to organize learners effectively during outdoor sessions. The findings revealed that principals protected instructional time by carefully planning, aligning with curriculum objectives, and integrating garden-based activities into formal teaching and learning processes. The pattern identified across participating schools is illustrated in Figure 2.

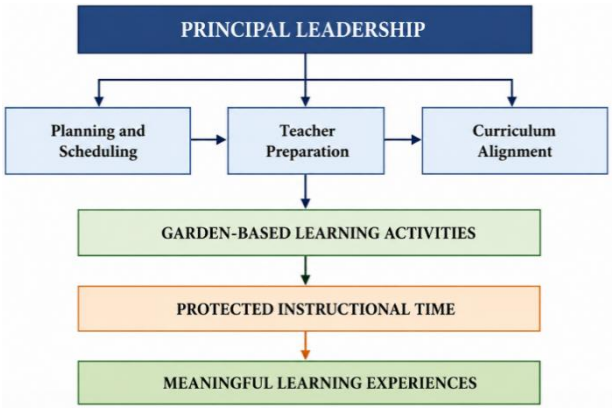

Figure 2. Principal Strategies for Protecting Instructional Time in School Food Gardens
Source: Developed from interview and field findings (Researcher's analysis, 2026)

Figure 2 demonstrates that principals played an important role in safeguarding instructional time in garden-based learning environments. Participants consistently emphasized that school food gardens should function as structured educational spaces rather than recreational areas. Through planning, scheduling, curriculum alignment, and teacher support, principals ensured that learning activities in the gardens directly contributed to educational objectives. Field findings further revealed that garden-based learning was integrated into classroom programs through purposeful instructional

practices that connected practical experiences with curriculum content. Collectively, the evidence suggests that protecting instructional time was essential for maximizing the educational value of school food gardens and ensuring that outdoor learning activities remained focused on meaningful learner development.

Creating Conducive Collaborative Learning Communities

Collaborative learning communities played a significant role in supporting the successful implementation of school food gardens. Participants consistently emphasized that the sustainability of garden-based learning depended on the active involvement of multiple stakeholders, including teachers, learners, parents, community members, and external partners. Principals viewed collaboration as a shared responsibility that extended beyond individual efforts and contributed to achieving common educational goals. The findings further indicate that creating opportunities for participation, communication, and collective decision-making strengthened relationships among stakeholders and fostered a supportive environment for teaching and learning. Through these collaborative efforts, school food gardens became spaces where educational, social, and community objectives were pursued simultaneously.

Principal 3 explained: "School success necessitates many employee groups working together in alignment with the school's vision." The findings suggest that principals viewed collective participation as a mechanism for building commitment and ensuring that stakeholders worked toward shared goals. Similarly, Principal 4 emphasized the importance of valuing contributions from different stakeholders: "The school should not be a one-man show; teachers and stakeholders have brilliant ideas, and all the manager needs to do is give them a chance to express their opinions." Participants consistently reported that collaborative environments encouraged the exchange of ideas, increased stakeholder commitment, and strengthened support for school initiatives. The interviews further revealed that open communication was considered essential for maintaining productive relationships among stakeholders. Principal 5 stated: "When we feel valued and heard, trust will be earned, and communication becomes a two-way conversation." Principal 1 remarked: "Stakeholder engagement is ongoing and continuous as it is closely linked to school improvement. Engagement can quickly turn to compliance, especially among guardians and learners."

The findings demonstrated that multiple stakeholder groups contributed to the establishment, maintenance, and educational use of school food gardens. The nature of these contributions and their role in supporting collaborative learning communities are summarized in Table 3.

Table 3. Stakeholder Collaboration Matrix in School Food Garden Programmes

Stakeholder Group	Primary Contribution	Contribution to Learning and Garden Sustainability
Principals	Leadership, coordination, and strategic direction	Ensured alignment of garden activities with school goals
Teachers	Planning and facilitating learning activities	Integrated garden experiences into teaching and learning
Learners	Participation in planting, maintenance, and harvesting	Developed practical skills, responsibility, and engagement
Parents and Guardians	Practical support and participation in garden activities	Strengthened home-school connections and learner support

Community Members	Sharing local knowledge and gardening expertise	Enhanced the relevance and sustainability of garden projects
External Partners and Organizations	Resources, technical support, and training	Expanded capacity and supported long-term garden development

Source: Developed from interview and field findings (Researcher's analysis, 2026).

Table 3 indicates that collaborative learning communities were essential to the successful implementation of school food gardens. Principals consistently emphasized the importance of involving diverse stakeholders in decision-making, planning, and implementation processes. The interviews revealed that collaboration was strengthened through open communication, shared responsibility, and opportunities for meaningful participation. Field findings further showed that school food gardens functioned as collective projects supported by teachers, learners, families, community members, and external partners. These collaborative relationships contributed not only to the maintenance of the gardens but also to the creation of supportive learning environments that encouraged participation, knowledge sharing, and collective ownership. Overall, the findings suggest that sustained collaboration among stakeholders played a crucial role in supporting both the educational and operational success of school food garden initiatives.

Discussion

The findings of this study reinforce and extend the growing body of literature on school food gardens as transformative environments for Education for Sustainability (EfS). Consistent with previous studies (Eugenio-Gozalbo et al., 2021; Sharp et al., 2025; Sherry, 2022), the results confirm that food gardens support experiential and inquiry-based learning, particularly by enhancing learner engagement and environmental awareness. However, the present study advances this understanding by demonstrating that the pedagogical value of school food gardens is not inherent in their physical presence but is contingent upon instructional leadership practices that intentionally embed them within the school's educational framework. This contrasts with earlier studies that largely conceptualize gardens as self-sufficient learning environments by revealing that without strategic leadership, their educational function remains underutilized or fragmented.

Regarding teacher professional learning, the findings align with prior research emphasizing the importance of continuous professional development for sustaining innovative pedagogies (Bendtsen et al., 2022; Skrbinjek et al., 2024). Nevertheless, this study makes a more context-specific contribution by showing that professional development in non-traditional learning environments requires an additional layer of pedagogical adaptation, in which teachers must simultaneously negotiate curriculum demands, spatial constraints, and experiential learning processes. This extends existing theoretical assumptions by positioning teacher capacity not merely as a supporting factor but as a mediating mechanism that determines whether sustainability-oriented learning is effectively enacted in practice.

From a learner development perspective, the emergence of self-efficacy and responsibility observed in this study corroborates earlier findings linking garden-based learning to increased engagement and environmental stewardship (Arizanis et al., 2025; Evans et al., 2024). However, a key divergence emerges in the mechanism of development: while prior literature often attributes learner outcomes solely to participation, this study demonstrates that self-efficacy is strengthened through iterative

cycles of achievement, reflection, and responsibility, facilitated by teacher guidance and leadership support. This finding contributes to social cognitive theory by illustrating how mastery experiences in authentic environmental contexts can be systematically structured through institutional leadership, thereby expanding the applicability of self-efficacy theory in sustainability education settings.

The study also provides a significant extension to instructional leadership theory, particularly Liu & Hallinger (2024) framework, by situating leadership practices within hybrid learning environments beyond traditional classrooms. While the existing literature emphasizes vision setting, curriculum alignment, and instructional monitoring, the present findings demonstrate that these dimensions are more impactful when applied to spatially expanded learning ecosystems, such as school food gardens. The integration of vision articulation, protection of instructional time, and curriculum embedding emerges as a unified leadership mechanism rather than isolated practices. This integration represents a novel theoretical contribution, suggesting that instructional leadership in EfS contexts operates as an ecological system rather than a linear administrative function.

In practice, the findings underscore that the successful implementation of school food gardens requires more than infrastructural investment; it demands sustained leadership capacity, structured teacher development, and multi-stakeholder collaboration. The study highlights that schools aiming to adopt sustainability-oriented programs must prioritize leadership development that enables principals to act as instructional designers of alternative learning spaces. Moreover, the results indicate that collaborative engagement with families and communities is not supplementary but essential for ensuring program continuity and relevance. This has direct implications for education policy, suggesting that EfS initiatives should include leadership training frameworks and community partnership models as core components of implementation.

CONCLUSION

School food gardens are known to support nutrition, the environment, and learning by doing. But not many people look at how leaders make these gardens last and become a real part of the school. This study shows that school food gardens are not just about having a garden, but about how school leaders put them into teaching and learning. Teacher training helps teachers teach better outside, and students become more confident and responsible, and are better able to solve problems when they join garden activities. Good leaders, matching the garden with the curriculum, and making sure there is time for garden lessons make the garden a real learning place, not just a side project. Also, when teachers, students, families, and the community work together, the garden can last longer. So, school food gardens can be important learning spaces for sustainability if there is strong leadership and everyone works together. Schools need to focus more on leadership, teacher support, and community engagement to make sustainability learning part of daily school life. More research should examine how these leadership approaches work in different schools and how they help students and the community in the long run.

ACKNOWLEDGEMENT

The author expresses gratitude to all school principals, teachers, learners, and school communities who participated in and supported this research. Appreciation is also

extended to academic supervisors for their guidance and constructive feedback, as well as to the institution for facilitating the research process. Finally, sincere thanks are given to family and colleagues for their continuous support and encouragement throughout the completion of this study.

REFERENCES

Ahmad, M., & Wilkins, S. (2025). Purposive Sampling in Qualitative Research: A Framework for the Entire Journey. *Quality & Quantity, 59*(2), 1461–1479. https://doi.org/10.1007/s11135-024-02022-5

Algurén, B. (2025). Toward Behavioral Learning Outcomes: A Case Study of an Experiential Learning Approach and Students' Self-Reported Facilitators and Barriers for Pro-Environmental Behavior. *International Journal of Sustainability in Higher Education, 26*(9), 265–280. https://doi.org/10.1108/IJSHE-01-2025-0063

Arizanis, E., Kyriazis, D., & Barkoukis, V. (2025). Effects of a School Garden Experiential Intervention Project on Primary Pupils' Environmental Behaviour. *Journal of Adventure Education and Outdoor Learning, 1–15*. https://doi.org/10.1080/14729679.2025.2494032

Bendtsen, M., Forsman, L., & Björklund, M. (2022). Exploring Empowering Practices for Teachers' Sustainable Continuing Professional Development. *Educational Research, 64*(1), 60–76. https://doi.org/10.1080/00131881.2021.2000338

Boeske, J. (2023). Leadership Towards Sustainability: A Review of Sustainable, Sustainability, and Environmental Leadership. *Sustainability, 15*(16), 12626. https://doi.org/10.3390/su151612626

Brauckmann, S., Pashiardis, P., & Ärlestig, H. (2023). Bringing Context and Educational Leadership Together: Fostering the Professional Development of School Principals. *Professional Development in Education, 49*(1), 4–15. https://doi.org/10.1080/19415257.2020.1747105

Dominguez-Hernandez, E., Hernandez, C., & Dominguez Hernandez, M. E. (2022). Sustainability in Home Garden Interventions to Improve Food Security: Results, Challenges, and Future Directions. *Transdisciplinary Journal of Engineering and Science, 13*, 111–140. https://doi.org/10.22545/2022/00168

Eugenio-Gozalbo, M., Ramos-Truchero, G., & Suárez-López, R. (2021). University Gardens for Sustainable Citizenship: Assessing the Impacts of Garden-Based Learning on Environmental and Food Education at Spanish Higher Education. *International Journal of Sustainability in Higher Education, 22*(3), 516–534. https://doi.org/10.1108/IJSHE-06-2020-0208

Eustachio, J. H. P. P., Brandli, L. L., Trevisan, L. V., Barbir, J., & Caldana, A. C. F. (2024). Implementing Sustainability in Teaching: The Role of Sustainability Leadership and Transformational Leadership in the Context of Higher Education Institutions. *Sustainable Development, 32*(5), 5331–5347. https://doi.org/10.1002/sd.2980

Evans, E., Green, G. T., (2024). From Program to Classroom: A Photo Elicitation Study to Understand Educators' Experiences Implementing Garden-Based Learning Following Professional Development. *Environmental Education Research, 30*(10), 1823–1839. https://doi.org/10.1080/13504622.2024.2309591

Gretschel, P., Ramugondo, E. L., & Galvaan, R. (2023). Linking Paradigms and Methodologies in a Qualitative Case Study Focused on Exploring the Operation of Power in Human Actions During the Design of a New Occupational Therapy Intervention. *International Journal of Qualitative Methods, 22*, 16094069231187590. https://doi.org/10.1177/16094069231187590

He, P., Guo, F., (2024). School Principals' Instructional Leadership as a Predictor of Teacher's Professional Development. *Asian-Pacific Journal of Second and Foreign Language Education, 9*(1), 63. https://doi.org/10.1186/s40862-024-00290-0

Hoang, A., Hepburn, S.-J., Tomizawa, S., Carroll, A., Edwards, E., & Sanders, M. (2025). Using a Stakeholder Engagement Approach to Inform Professional Development Programs to Promote Education for Sustainability in Schools. *Environmental Education Research, 31*(6), 1135–1153. https://doi.org/10.1080/13504622.2024.2419903

Holloway, T. P., Jayasinghe, S., Dalton, L., (2023). Enhancing Food Literacy and Food Security Through School Gardening in Rural and Regional Communities. *International Journal of Environmental Research and Public Health, 20*(18), 6794. https://doi.org/10.3390/ijerph20186794

Holst, J. (2023). Towards Coherence on Sustainability in Education: A Systematic Review of Whole Institution Approaches. *Sustainability Science, 18*(2), 1015–1030. https://doi.org/10.1007/s11625-022-01226-8

Huambachano, M., Arulingam, I., (2022). Knowledge Networks to Support Youth Engagement in Sustainable Food Systems. *Frontiers in Sustainable Food Systems, 6*, 867344. https://doi.org/10.3389/fsufs.2022.867344

Huq, F. F., & Deacon, L. (2025). A Systematic Review of Community Gardens and Their Role in Urban Food Security and Resilience. *Discover Sustainability, 6*(1), 696. https://doi.org/10.1007/s43621-025-01628-5

Kanosvamhira, T. P. (2025). Growing Together: Unveiling the Potential of School-Based Community Gardens to Foster Well-Being, Empowerment, and Sustainability. *Urban Transformations, 7*(1), 2. https://doi.org/10.1186/s42854-024-00069-z

Kempler, J. V., Margerison, C., Nanayakkara, J., & Booth, A. (2025). Examining the Role of School Food Gardens, Food Waste Systems and Cooking Facilities in Experiential Education: A Cross-Sectional Survey of Primary School Teachers' Practices. *Archives of Public Health, 83*(1), 285. https://doi.org/10.1186/s13690-025-01761-7

Liu, S., & Hallinger, P. (2024). The Effects of Instructional Leadership, Teacher Responsibility and Procedural Justice Climate on Professional Learning Communities: A Cross-Level Moderated Mediation Examination. *Educational Management Administration & Leadership, 52*(3), 556–575. https://doi.org/10.1177/17411432221089185

Mettis, K., & Väljataga, T. (2021). Designing Learning Experiences for Outdoor Hybrid Learning Spaces. *British Journal of Educational Technology, 52*(1), 498–513. https://doi.org/10.1111/bjet.13034

Mtisi, S. (2022). The Qualitative Case Study Research Strategy as Applied on a Rural Enterprise Development Doctoral Research Project. *International Journal of Qualitative Methods, 21*. https://doi.org/10.1177/16094069221145849

Nguyen, T. P. L. (2025). Sustainability-Oriented Leadership, Knowledge Management Processes and Green Innovation in Service Companies. *Journal of Knowledge Management, 29*(9), 2986–3010. https://doi.org/10.1108/JKM-10-2024-1241

Nontu, Y., Mdoda, L., Dumisa, B. M., (2024). Empowering Rural Food Security in the Eastern Cape Province: Exploring the Role and Determinants of Family Food Gardens. *Sustainability, 16*(16), 6780. https://doi.org/10.3390/su16166780

Peretz, R. (2025). Integrating Systems Thinking into Sustainability Education: An Overview with Educator-Focused Guidance. *Education Sciences, 15*(12), 1685. https://doi.org/10.3390/educsci15121685

Prasetyo, R. A. B., (2024). Improving Children's Environmental Literacy Through Experiential Learning. *Transformasi: Jurnal Pengabdian Masyarakat, 20*(2), 215–229. https://doi.org/10.20414/transformasi.v20i2.10030

Reffhaug, M. B. A., & Lysgaard, J. A. (2024). Conceptualisations of "Critical Thinking" in Environmental and Sustainability Education. *Environmental Education Research, 30*(9), 1519–1534. https://doi.org/10.1080/13504622.2024.2363848

Riazi, A. M., Ghanbar, H., & Rezvani, R. (2023). Qualitative Data Coding and Analysis: A Systematic Review of the Papers Published in the Journal of Second Language Writing. *Iranian Journal of Language Teaching Research, 11*(1), 25–47. https://doi.org/10.30466/ijltr.2023.121271

Shaked, H., & Hallinger, P. (2026). Instructional Leadership in a 21st Century Global Context: A Conceptual Review. *International Journal of Leadership in Education, 1–24*. https://doi.org/10.1080/13603124.2026.2665114

Sharp, E., Tsang, S., & Egli, V. (2025). Children's Food Gardening: Valuing Experiential, Intergenerational and Multi-Cultural Learning. *Kōtuitui: New Zealand Journal of Social Sciences Online, 20*(4), 738–762. https://doi.org/10.1080/1177083X.2024.2425427

Sherry, C. (2022). Learning From the Dirt: Initiating University Food Gardens as a Cross-Disciplinary Tertiary Teaching Tool. *Journal of Outdoor and Environmental Education, 25*(2), 199–217. https://doi.org/10.1007/s42322-022-00100-6

Silva, P. (2025). Enhancing Adolescent Food Literacy Through Mediterranean Diet Principles: From Evidence to Practice. *Nutrients, 17*(8), 1371. https://doi.org/10.3390/nu17081371

Skrbinjek, V., Vičič Krabonja, M., Aberšek, B., & Flogie, A. (2024). Enhancing Teachers' Creativity With an Innovative Training Model and Knowledge Management. *Education Sciences, 14*(12), 1381. https://doi.org/10.3390/educsci14121381

Tajik, O., Golzar, J., & Noor, S. (2025). Purposive Sampling. *International Journal of Education & Language Studies, 1–9*. https://doi.org/10.1186/s40862-024-00299-5

Teoule, F. (2025). Community Gardens as Natural Third Places: A Conceptual Framework. *Contemporary Social Science, 1–23*. https://doi.org/10.1080/21582041.2025.2587880

Varman, S. D., Cliff, D. P., (2021). Experiential Learning Interventions and Healthy Eating Outcomes in Children: A Systematic Literature Review. *International Journal of Environmental Research and Public Health, 18*(20), 10824. https://doi.org/10.3390/ijerph182010824

Wang'ombe, T. (2023). The Role of Educational Leadership in Fostering a Positive School Culture and Enhancing Teacher Retention. *European Journal of Education, 1*(1), 31–43.