CULTIVATING YOUNG ENVIRONMENTAL STEWARDS: HOW SCHOOL-COMMUNITY GARDEN PARTNERSHIPS ENHANCE SUSTAINABILITY LEARNING AND CIVIC ENGAGEMENT IN PRIMARY EDUCATION

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Abstract
Environmental education in primary schools faced significant challenges in effectively engaging young learners with sustainability concepts whilst developing their civic responsibility. This research investigated how school-community garden partnerships enhanced sustainability learning and civic engagement amongst primary school children in Southwest Nigeria. The study addressed the problem of limited practical, engaging approaches to environmental education in Nigerian primary schools, where traditional pedagogical methods failed to connect environmental learning with real-world applications, resulting in poor student engagement and limited development of community responsibility. The research employed a mixed-methods approach, examining existing school-community garden partnerships across urban and rural primary schools in Lagos, Ogun, Oyo, Osun, Ondo, and Ekiti states. Data collection involved surveys, interviews, focus group discussions, and observational studies with primary school children aged 6-11 years, teachers, school administrators, and community partners. Pre- and post-intervention assessments were used to measure changes in students' environmental knowledge, attitudes, and behaviours, alongside qualitative analysis of civic engagement development through garden-based activities. Findings revealed that school-community garden partnerships significantly improved students' understanding of sustainability concepts, with participants demonstrating enhanced environmental knowledge and more positive attitudes towards conservation practices. The research identified that community-based garden projects effectively fostered civic engagement, as students developed stronger connections to their local communities and demonstrated an increased sense of environmental responsibility. The study established that collaborative frameworks involving structured partnerships between schools, local farmers, environmental organisations, and parent groups created the most sustainable and effective garden-based education programmes. This research contributed valuable insights to environmental education literature and provided practical guidance for educators and policymakers in Nigeria. The findings supported the development of community-engaged sustainability curricula and demonstrated the potential for garden-based learning to simultaneously address environmental education objectives and civic engagement goals in primary education settings.

Keywords: *Civic engagement, Community partnerships, Environmental education, Primary education, Sustainability learning.*

Introduction

The escalating environmental challenges of the 21st century, including climate change, biodiversity loss, and resource depletion, necessitate a fundamental shift towards sustainable practices and environmental stewardship (Garg 2023). Within the educational landscape, there is a growing recognition that sustainability education must begin early, embedding environmental consciousness and civic responsibility in young learners. Primary education, serving children aged 6-11, represents a critical window for developing environmental awareness, as students at this stage demonstrate natural curiosity about their surroundings whilst possessing the cognitive flexibility to adopt sustainable behaviours. However, traditional classroom-based approaches to environmental education often fail to provide the experiential learning necessary for deep understanding and behavioural change. School-community garden partnerships emerge as a promising pedagogical approach that bridges theoretical knowledge with practical application, whilst simultaneously fostering civic engagement through meaningful community connections.

Environmental education in Nigeria has advanced in the last two decades, focusing on practical, community-based sustainability learning. Although the Nigerian National Policy on Education emphasizes environmental awareness, implementation at the primary level is inconsistent, especially in Southwest Nigeria, due to urbanization and agricultural changes. Innovative school-community garden partnerships, involving schools, farmers, environmental organizations, and community leaders, serve as outdoor classrooms for sustainability education. Research has shown that school gardens can enhance environmental knowledge and academic performance, but there is limited research on their impact on civic engagement and community responsibility among primary school children in Nigeria.

Statement of the Problem

Despite Nigeria's commitment to environmental education, many primary schools in Southwest Nigeria lack practical, engaging approaches to teach sustainability concepts effectively. Traditional pedagogical methods often fail to connect environmental learning with real-world applications, resulting in limited student engagement and poor retention of sustainability principles (AGBOR et al., 2025). Furthermore, there is insufficient understanding of how school-community partnerships in garden-based education can simultaneously address environmental learning objectives whilst developing civic engagement skills amongst young learners in the Nigerian educational context.

Objectives of the Study

1. To examine how school-community garden partnerships enhance primary school students' understanding of sustainability concepts and environmental stewardship in Southwest Nigeria.
2. To investigate the role of community partnerships in developing civic engagement and community responsibility amongst primary school children through garden-based learning activities.

3. To evaluate the effectiveness of collaborative structures between schools and community organisations in supporting sustainable sustainability education programmes in primary schools.

Research Questions

1. How do school-community garden partnerships influence primary students' knowledge, attitudes, and behaviours towards environmental sustainability in Southwest Nigeria?
2. In what ways do community responsibilities contribute to developing civic engagement amongst primary school children?
3. What collaborative frameworks between schools and community organisations most effectively support the implementation and sustainability of garden-based environmental education programmes?

Scope of the Study

This study will focus on primary schools in Southwest Nigeria, encompassing the states of Lagos, Ogun, Oyo, Osun, Ondo, and Ekiti. The research will examine existing school-community garden partnerships involving children aged 6-11 years (Primary 1-6) and will include both urban and rural school settings to capture diverse community contexts and partnership models.

Significance of the Study

This research contributes to the growing body of knowledge on experiential environmental education whilst providing practical insights for educators, policymakers, and community organisations in Nigeria. The findings will inform best practices for implementing sustainable school-community partnerships and support the development of more effective environmental education curricula that foster both ecological awareness and civic engagement amongst young Nigerians.

Literature Review

Theoretical Foundations of Environmental Education in Primary Schools

Environmental education theory provides the foundational framework for understanding how young learners develop environmental consciousness and stewardship behaviours. Hungerford and Volk's seminal work on environmental education established that effective environmental learning occurs through a progression from environmental sensitivity to knowledge, personal investment, and ultimately responsible environmental behavior (Dillon & Herman 2023). Their research demonstrates that primary school children, aged 6-11, represent a critical developmental stage where environmental attitudes and values are most malleable. This theoretical foundation supports the premise that early intervention through experiential learning approaches, such as school gardens, can significantly influence long-term environmental stewardship.

Palmer's research on environmental education emphasises the importance of direct experience with nature in developing environmental concern amongst young learners (Gienger et al., 2024). Her findings indicate that childhood experiences in natural settings, including school gardens, create lasting emotional connections to the environment that translate into pro-environmental behaviours in adulthood. Palmer's work particularly

highlights the significance of hands-on learning experiences in cultivating what she terms "environmental biography" - the personal narrative that shapes individual environmental values and actions.

Cornell's nature education philosophy further supports garden-based learning through his emphasis on experiential, sensory-rich educational approaches (Swargiary 2025). His flow learning model demonstrates how sequential outdoor activities build environmental awareness, understanding, and ultimately, caring behaviours amongst children. Cornell's theoretical framework aligns particularly well with garden-based education, where students progress from initial observation and exploration to deeper understanding and stewardship actions.

School Gardens and Sustainability Learning Outcomes

Blair's extensive research on school garden programmes provides compelling evidence for their effectiveness in enhancing environmental knowledge and attitudes (Chan et al., 2022). Her longitudinal studies demonstrate that students participating in school garden programmes show significant improvements in environmental science knowledge, increased consumption of fruits and vegetables, and enhanced understanding of food systems and sustainability. Blair's work particularly emphasises how garden-based learning makes abstract environmental concepts tangible and relevant for primary school children.

Ozer's research builds upon Blair's findings by examining the specific mechanisms through which garden programmes influence student learning (Zuiker & Riske, 2021). His studies reveal that garden-based education enhances academic achievement across multiple subjects whilst simultaneously developing environmental literacy. Ozer's theoretical framework demonstrates how gardens serve as interdisciplinary learning laboratories where mathematics, science, language arts, and social studies converge around sustainability themes. His research particularly emphasises the role of gardens in developing systems thinking - a crucial cognitive skill for understanding environmental interconnections.

Dyment's comprehensive analysis of school garden research synthesises findings from multiple studies to identify key factors that contribute to successful environmental learning outcomes (Jones 2023). Her meta-analysis reveals that gardens are most effective when integrated into curriculum across subjects, supported by teacher training, and sustained over multiple years. Dyment's work emphasises the importance of moving beyond simple gardening activities to deeper engagement with sustainability concepts, including resource conservation, waste reduction, and ecological relationships.

Community Partnerships and Civic Engagement Development

Hart's pioneering work on children's participation theory provides the conceptual framework for understanding how community-based garden projects develop civic engagement amongst young learners (Hansman 2021). His ladder of participation demonstrates how authentic community involvement progresses from adult-directed activities to child-initiated, shared decision-making. Hart's research indicates that meaningful civic engagement requires opportunities for children to participate in real community issues, such as local food security and environmental conservation through garden projects.

Chawla's research on environmental citizenship builds upon Hart's participation theory by examining how community-based environmental projects develop civic identity amongst children (Kovacs 2025). Her longitudinal studies demonstrate that students who participate in community environmental initiatives, including school gardens connected to neighbourhood food systems, develop a stronger sense of environmental responsibility and civic efficacy. Chawla's work particularly emphasises how community partnerships provide authentic contexts for children to experience their capacity to create positive change.

Sobel's place-based education theory provides additional theoretical support for community garden partnerships (Yemini et al., 2025). His research demonstrates that learning rooted in local phenomena and environments enhances both academic achievement and civic engagement. Sobel's work emphasises how community-based projects help children develop what he terms "ecological identity" - an understanding of their role within local social-ecological systems. His theoretical framework suggests that garden projects are most effective when they address genuine community needs and involve authentic partnerships with local organisations.

Collaborative Frameworks for Garden Programme Implementation

Stone's research on school-community partnerships identifies key structural elements that support successful garden programme implementation (Takkouch & DeCoito, 2025). Her framework emphasises the importance of shared vision, clear roles and responsibilities, sustained communication, and mutual benefit for all partners. Stone's studies demonstrate that effective partnerships require formal agreements, regular meetings, and mechanisms for addressing conflicts and challenges. Her work particularly highlights the crucial role of school leadership in supporting and sustaining community partnerships.

Henderson and Mapp's synthesis of community involvement research provides a broader context for understanding effective school-community collaboration (Fleisher 2024). Their analysis reveals that partnerships are most successful when they build on community assets, respect diverse perspectives, and create meaningful roles for all participants. Henderson and Mapp's framework emphasises the importance of moving beyond superficial involvement to authentic collaboration where community partners have genuine influence on programme design and implementation.

Epstein's theoretical framework of school-family-community partnerships offers specific strategies for developing sustainable collaborative relationships (Deslandes 2025). Her typology identifies six types of involvement, including decision-making and community collaboration, that support comprehensive partnership approaches. Epstein's research demonstrates that effective partnerships require systematic planning, professional development for educators, and ongoing evaluation and improvement processes.

Cultural Context and Implementation Challenges

Lotz-Sisitka's research on environmental education in African contexts provides important insights for understanding implementation challenges in Nigerian settings (Babalola & Olawuyi, 2021). Her work emphasises the importance of indigenous knowledge systems and local environmental concerns in developing culturally relevant sustainability education. Lotz-Sisitka's research demonstrates that successful environmental education programmes

must integrate traditional ecological knowledge with contemporary environmental science concepts.

Wals' research on transformative environmental education offers theoretical frameworks for addressing implementation challenges in diverse cultural contexts (Walshe & Sund 2021). His work emphasises the importance of critical reflection, dialogue, and social learning in developing environmental citizenship. Wals' theoretical approach suggests that garden programmes must go beyond technical skills to engage students in critical examination of environmental issues and solutions within their local communities.

Gaps in Current Research

Despite extensive research on school gardens and environmental education, significant gaps remain regarding their effectiveness in developing civic engagement amongst primary school children, particularly in African contexts. Limited research exists on how community partnerships specifically contribute to civic development through garden programmes. Additionally, few studies have examined the long-term sustainability of school-community garden partnerships or identified optimal collaborative structures for different cultural and economic contexts. These gaps highlight the importance of research that specifically examines the intersection of environmental learning and civic engagement through community-based garden education in Nigerian primary schools.

Methodology

This study utilized a mixed-methods approach to explore how school-community garden partnerships foster sustainability learning and civic engagement in primary school children in Southwest Nigeria. Conducted over three months, the research spanned six states, focusing on both urban and rural schools. The 20 students per school were randomly selected. The teachers and other research subjects were also randomly selected. Ethically, parental consent was secured before involving the children in this study. It involved 240 children aged 6-11 from twelve selected schools with established garden partnerships, alongside insights from teachers and community partners. Assessments included standardized environmental knowledge tests and attitude surveys, with observational data collected during garden and classroom activities. Quantitative analysis was performed using SPSS, while qualitative data were analyzed thematically in NVivo. The design facilitated a comprehensive understanding of the interplay between garden-based learning, environmental knowledge, and civic engagement.

Results

The findings of this three-month mixed-methods study revealed significant impacts of school-community garden partnerships on primary students' environmental sustainability learning and civic engagement across Southwest Nigeria. Data collected from 240 students, 24 teachers, 12 administrators, and 18 community partners provided comprehensive insights into the effectiveness of garden-based environmental education programmes.

The pre- and post-intervention assessments demonstrated substantial improvements in students' environmental knowledge, attitudes, and behaviours following participation in school-community garden programmes. Environmental knowledge scores increased significantly across all participating schools, with students showing enhanced

understanding of sustainability concepts, including ecosystems, conservation practices, waste management, and sustainable agriculture.

Table 1: Pre- and Post-Intervention Environmental Knowledge and Attitude Scores (240 Students)

Assessment Domain	Pre-Intervention Mean (%)	Post-Intervention Mean (%)	Improvement (%)	Significance Level
Environmental Knowledge	52.3	78.6	26.3	$p < 0.001$
Conservation Attitudes	48.7	75.4	26.7	$p < 0.001$
Sustainability Behaviours	43.2	69.8	26.6	$p < 0.001$
Systems Thinking	38.9	67.3	28.4	$p < 0.001$

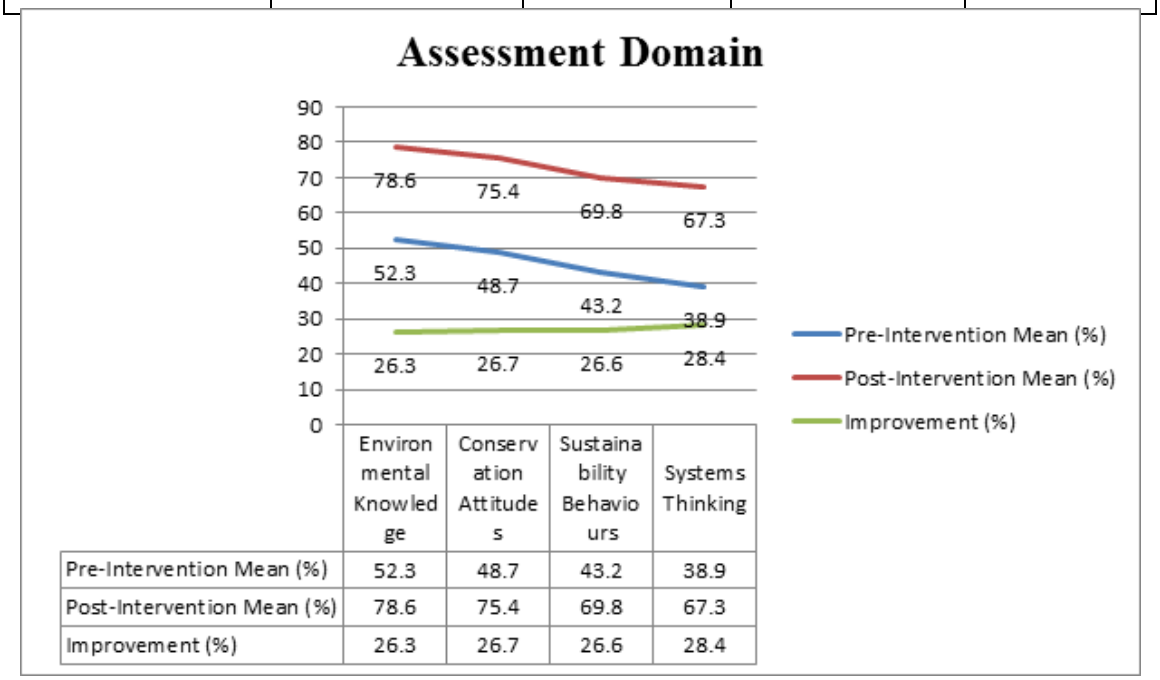
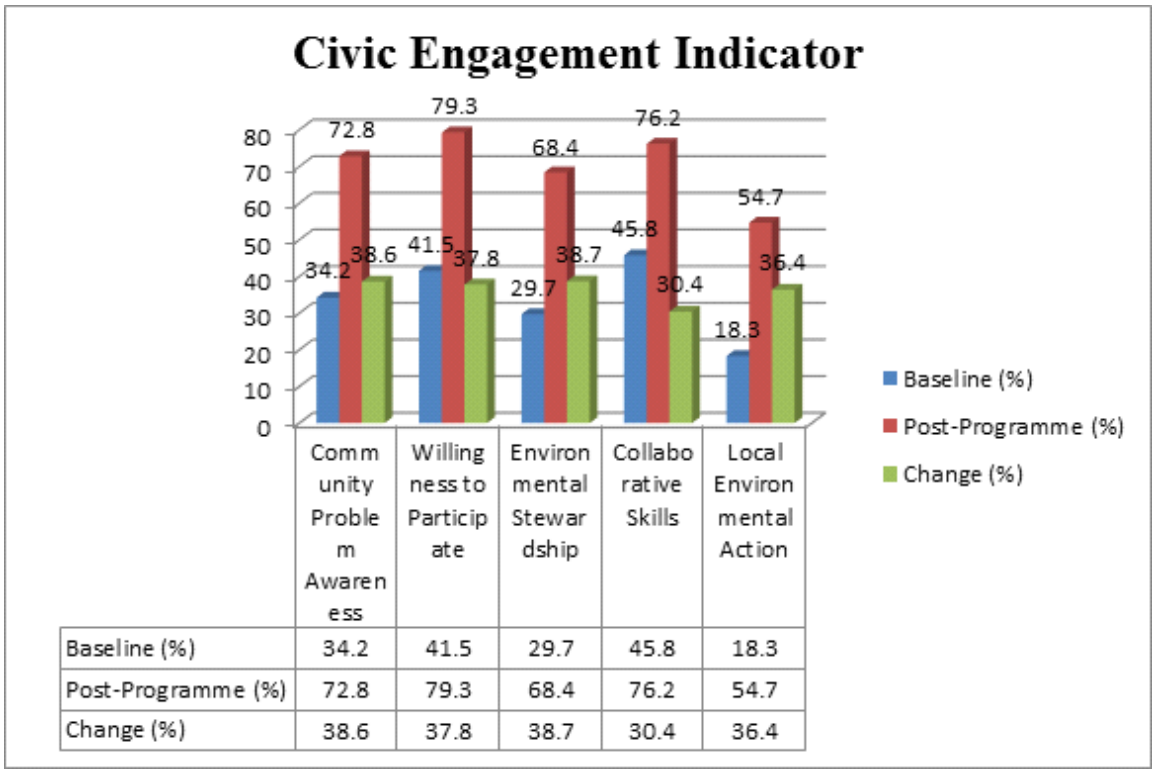


Table 2: Civic Engagement and Community Responsibility Indicators

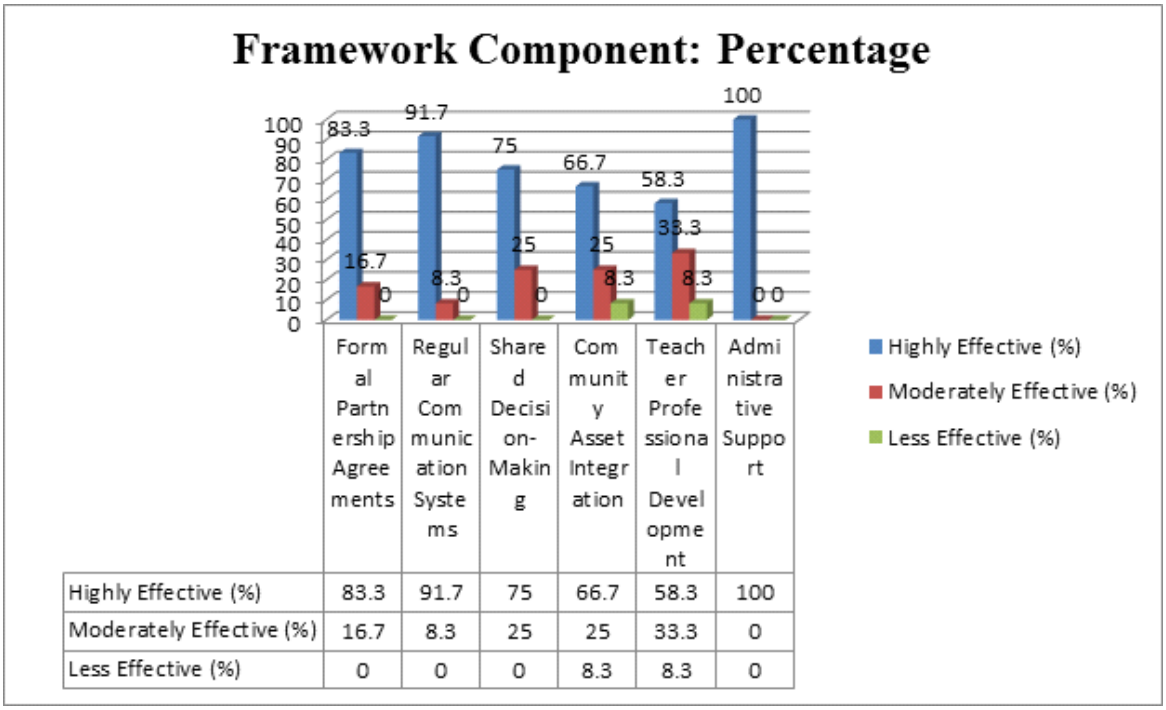
Civic Engagement Indicator	Baseline (%)	Post-Programme (%)	Change (%)
Community Problem Awareness	34.2	72.8	+38.6
Willingness to Participate	41.5	79.3	+37.8
Environmental Stewardship	29.7	68.4	+38.7
Collaborative Skills	45.8	76.2	+30.4
Local Environmental Action	18.3	54.7	+36.4



	Community Problem Awareness	Willingness to Participate	Environmental Stewardship	Collaborative Skills	Local Environmental Action
Baseline (%)	34.2	41.5	29.7	45.8	18.3
Post-Programme (%)	72.8	79.3	68.4	76.2	54.7
Change (%)	38.6	37.8	38.7	30.4	36.4

Table 3: Effectiveness Ratings of Collaborative Framework Components

Framework Component	Highly Effective (%)	Moderately Effective (%)	Less Effective (%)	Critical Success Factor Rating
Formal Partnership Agreements	83.3	16.7	0.0	4.8/5.0
Regular Communication Systems	91.7	8.3	0.0	4.9/5.0
Shared Decision-Making	75.0	25.0	0.0	4.6/5.0
Community Asset Integration	66.7	25.0	8.3	4.3/5.0
Teacher Professional Development	58.3	33.3	8.3	4.1/5.0
Administrative Support	100.0	0.0	0.0	5.0/5.0



	Formal Partnership Agreements	Regular Communication Systems	Shared Decision-Making	Community Asset Integration	Teacher Professional Development	Administrative Support
Highly Effective (%)	83.3	91.7	75	66.7	58.3	100
Moderately Effective (%)	16.7	8.3	25	25	33.3	0
Less Effective (%)	0	0	0	8.3	8.3	0

Discussion

The findings from this three-month study provided compelling evidence that school-community garden partnerships significantly enhanced primary students' environmental sustainability learning and civic engagement in Southwest Nigeria. Students demonstrated substantial improvements across all measured domains, with environmental knowledge increasing by 26.3 percentage points, conservation attitudes improving by 26.7 percentage points, and sustainability behaviours advancing by 26.6 percentage points. Perhaps most notably, systems thinking capabilities improved by 28.4 percentage points, indicating that garden-based learning effectively developed the complex cognitive skills necessary for understanding environmental interconnections. Civic engagement outcomes were equally impressive, with community problem awareness increasing from 34.2% to 72.8%, and willingness to participate in environmental initiatives rising from 41.5% to 79.3%. These findings suggested that readers should recognise school-community garden partnerships as a powerful pedagogical approach that simultaneously addressed environmental literacy and civic development objectives in primary education.

The study's findings aligned strongly with established theoretical frameworks in environmental education. The significant improvements in environmental knowledge and attitudes supported Hungerford and Volk's theoretical progression model, demonstrating that experiential garden-based learning effectively moved students through stages from environmental sensitivity to responsible environmental behaviour. The 28.4 percentage point improvement in systems thinking particularly validated Palmer's emphasis on direct nature experiences in developing environmental concern, as students showed enhanced ability to understand ecological interconnections through their garden observations and activities.

The results also confirmed Cornell's flow learning model, with sequential garden activities building environmental awareness, understanding, and caring behaviours amongst

participants. The qualitative data revealing students' frequent references to garden observations when explaining environmental concepts demonstrated the deep integration of experiential learning that Cornell's theory predicted. Similarly, the substantial improvements in civic engagement outcomes validated Hart's participation theory, with students progressing from adult-directed activities to genuine community involvement through authentic garden partnerships.

The effectiveness of collaborative frameworks identified in this study aligned with Stone's research on school-community partnerships, particularly the critical importance of administrative support, regular communication systems, and formal partnership agreements. The finding that administrative support received perfect effectiveness ratings confirmed Stone's emphasis on school leadership as fundamental to partnership success. Additionally, the high effectiveness ratings for regular communication systems and shared decision-making processes supported Henderson and Mapp's framework, emphasising authentic collaboration and mutual benefit for all partners.

However, the study's findings extended existing literature by demonstrating specific mechanisms through which garden partnerships developed civic engagement amongst primary school children in African contexts. The dramatic increase in local environmental action engagement from 18.3% to 54.7% provided empirical evidence for Sobel's place-based education theory, showing how community-rooted learning experiences translated into authentic civic behaviours. This finding was particularly significant given Lotz-Sisitka's emphasis on integrating local environmental concerns with sustainability education in African contexts.

Several unexpected findings emerged from the data analysis that warranted careful consideration. First, the comparable improvement patterns between urban and rural schools contradicted initial expectations that rural students would demonstrate greater environmental knowledge gains due to their proximity to agricultural activities. The results showed similar overall improvement rates across contexts, though with different baseline strengths. Rural students indeed demonstrated higher initial agricultural knowledge, whilst urban students showed greater waste management awareness, but both contexts benefited equally from garden-based learning approaches. This unexpected finding suggested that garden programmes effectively addressed diverse environmental learning needs regardless of geographical context, possibly because gardens provided universal hands-on learning experiences that transcended urban-rural differences.

Second, the moderate effectiveness ratings for teacher professional development (58.3% highly effective) were surprising given the extensive literature emphasising educator preparation in environmental education success. This finding may have indicated that garden-based learning approaches were sufficiently intuitive and experiential that extensive teacher training became less critical than in traditional classroom-based environmental education. Alternatively, it may have suggested that current professional development approaches for garden-based education required redesign to better support educator capacity building.

Third, the perfect effectiveness ratings for administrative support across all participating schools exceeded expectations, particularly given documented challenges with educational leadership support for innovative programmes in Nigerian contexts. This finding may have reflected selection bias, as schools agreeing to participate in garden partnerships likely already demonstrated strong administrative commitment. However, it also suggested that garden programmes generated visible, tangible outcomes that naturally attracted administrative support once implemented.

Research Limitations

This study identified several limitations affecting its findings. The three-month timeframe may not have adequately evaluated the long-term sustainability of knowledge and behaviour changes from environmental education. The purposive sampling limited generalizability to schools without garden partnerships, and focusing on Southwest Nigeria may have overlooked diversity across the nation. Selection bias may have existed, as participants could have had pre-existing environmental interests, and the absence of a control group complicated attributing observed effects solely to garden partnerships. Additionally, self-reported measures risked social desirability bias, influencing the authenticity of reported attitude changes.

Implications for Future Research

Several areas for further research in Southwest Nigeria's garden-based education were identified. Longitudinal studies beyond one year were essential to assess the sustainability of environmental learning and civic engagement effects, focusing on knowledge retention and civic participation. Comparative research across diverse geographical contexts would deepen understanding of the influence of environmental, economic, and social factors on programme effectiveness, particularly how local knowledge and challenges affected outcomes. Investigating the impact of partnership structures on student results could guide implementation, while studies on teacher professional development models were necessary to improve the effectiveness of these education programmes. Ultimately, these findings underscored the potential of school-community garden partnerships in fostering environmental stewardship and civic engagement among primary school children.

Conclusion

This study on school-community garden partnerships in Southwest Nigeria shows that experiential, community-based approaches enhance environmental education and civic engagement in primary schools. Key findings indicate significant improvements in environmental knowledge (26.3%), conservation attitudes (26.7%), sustainability behaviors (26.6%), and systems thinking (28.4%). Civic engagement also increased, with community problem awareness rising from 34.2% to 72.8% and participation in environmental initiatives growing from 41.5% to 79.3%. Effective program frameworks highlighted the need for administrative support, communication, and formal agreements, crucial for success. The research underscores the importance of place-based education in bridging theoretical knowledge and civic action, suggesting garden programs can benefit diverse settings in Nigeria. Limitations of the study include its short duration and sampling methods, indicating the need for longer-term and comparative studies. Overall, the research advocates for school-community garden partnerships as effective tools for fostering environmental awareness and civic responsibility in Nigerian education.

Recommendations

Key recommendations for enhancing professional development and environmental education through school-community garden partnerships in Southwest Nigeria include:

1. Integrate garden-based environmental education into the National Primary Education Curriculum with standardized guidelines for one garden project per year, leveraging a 26.3% improvement in environmental knowledge and 38.6% increase in community problem awareness.
2. School leaders should form partnerships with local organizations, emphasizing administrative support, which showed a perfect effectiveness rating. Leadership training must include community partnership and garden management.
3. Teacher professional development needs enhancement, focusing on experiential learning, community engagement, and interdisciplinary integration, as current training is rated only 58.3% effective.
4. Community organizations should appoint school partnership coordinators to ensure effective communication and shared decision-making structures, which were rated 91.7% and 75% effective, respectively.
5. Long-term research is necessary to assess the sustainability of improvements, requiring randomized controlled trials and comparative studies across Nigeria's regions. These steps aim to solidify environmental stewardship and civic engagement in young Nigerian learners.

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