

EVALUATING THE EFFECTIVENESS OF CURRICULUM-BASED INTERVENTIONS IN PROMOTING SUSTAINABLE DEVELOPMENT IN NIGERIA

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Abstract

This study investigated the relationship between curriculum-based interventions and sustainable development among secondary school students in Nigeria. The study was guided by Constructivist Learning Theory and Social Learning Theory. A descriptive survey research design was adopted. The population comprised all SSS II students and teachers in public and private secondary schools in Owerri municipal council. Using multi-stage sampling, 650 respondents consisting of 600 SSS II students and 50 teachers were selected from 10 schools. Data were collected with a structured questionnaire using a 4-point Likert scale for knowledge and attitudes and a 4-point frequency scale for practices. Mean and standard deviation were used to answer research questions, while t-test and Pearson Product Moment Correlation were used to test the hypotheses at 0.05 level of significance. The findings revealed that curriculum-based interventions have a significant positive influence on students' knowledge of and attitudes toward sustainable development, $t(598) = 4.82, p < .05$. There was also a significant strong positive relationship between implementation of the interventions and students' engagement in sustainable practices, $r = .62, p < .05$. The study concluded that effective curriculum-based interventions are critical for developing learners who are knowledgeable, positively disposed and actively engaged in sustainable development. It was recommended that teachers' capacity be strengthened, instructional materials be provided and schools should model sustainable practices to enhance implementation.

Keywords: Curriculum-Based Interventions, Sustainable Development, Secondary Schools, Knowledge, Attitudes, Practices

Introduction

Nigeria is at a critical juncture where the aspirations of national growth must be reconciled with the realities of environmental degradation, social inequality, and economic instability. The global community has responded to these interconnected challenges through the 2030 Agenda

for Sustainable Development, which outlines seventeen goals that seek to balance economic prosperity with ecological integrity and social inclusion. For Nigeria, a nation endowed with diverse natural resources yet burdened by youth unemployment, climate vulnerability and gaps in quality education, the attainment of these goals cannot be left to policy pronouncements alone. It must be deliberately cultivated through the systems that shape the consciousness and competencies of future citizens. Obizue & Obizue [2025] observed that the school curriculum stands out as one of the most enduring and far-reaching of such systems and that curriculum is more than a collection of subjects or a timetable of lessons but a social instrument through which a society transmits its values, knowledge and vision for the future. In the Nigerian context, the Basic Education Curriculum and the Senior Secondary School Curriculum have undergone several reforms to respond to changing national needs. However, the emphasis has largely remained on cognitive mastery for examination purposes, with limited attention to how learning experiences translate into attitudes and actions that sustain communities. This gap becomes evident when learners graduate with strong grades but with little disposition toward environmental stewardship, civic responsibility, or innovative problem solving for local challenges. The disconnection between what is taught and what is required for a sustainable society suggests that curriculum content, pedagogy, and assessment must be re-examined and re-engineered. The concept of curriculum-based interventions therefore emerges as a response to this disconnection. It refers to purposeful modifications within the curriculum that embed principles, skills and practices of sustainability into the daily life of schools [Ezedi, 2023]. Such interventions may take the form of infusion of sustainability themes into existing subjects, project-based learning that addresses community problems, or school-wide programmes that model sustainable practices in energy use, waste management and social equity. When properly designed, these interventions move learners beyond the memorization of facts toward the internalization of values such as intergenerational responsibility, resource efficiency, and inclusive participation. They create learning environments where students do not only study sustainability but also practice it.

In Nigeria, the urgency for such curriculum reorientation is amplified by prevailing realities. Desertification continues to advance in the northern regions, coastal erosion threatens communities in the Niger Delta, and rapid urbanization in cities like Owerri exerts pressure on infrastructure and public services. At the same time, a large youth population faces limited opportunities for decent work, while issues of gender disparity and social exclusion persist in many communities. These are not peripheral concerns that can be addressed after economic growth has been achieved. They are central to the kind of development that Nigeria must pursue if it is to avoid cycles of resource depletion and social tension. Education and specifically the curriculum, is uniquely positioned to prepare young people to understand these challenges, question unsustainable patterns, and contribute solutions that are contextually relevant.

Evaluating the effectiveness of curriculum-based interventions thus becomes a scholarly and practical necessity. Effectiveness in this context is not limited to improved test scores. It encompasses changes in learners' knowledge of sustainable development concepts, shifts in attitudes toward the environment and society, and the demonstration of behaviours that reflect

responsible citizenship. Uzundu [2022] and Obizue & Obizue [2025] asserted that curriculum intervention effectiveness extends to the capacity of schools to sustain these interventions through teacher competence, institutional support and community involvement. Without systematic evaluation, curriculum reforms risk becoming symbolic, with policies that exist on paper but do not alter classroom practice or student outcomes. A rigorous assessment will reveal what aspects of the interventions are working, what constraints are impeding implementation, and how learning can be scaled across diverse Nigerian contexts.

The significance of this evaluation is further heightened by Nigeria's commitment to international and regional frameworks on education and development. The National Policy on Education emphasizes functional education that promotes self-reliance and national unity. Obizue & Obizue [2025] similarly stated that, the United Nations Educational, Scientific and Cultural Organization has advanced Education for Sustainable Development as a transformative approach that equips learners with the knowledge and skills needed to shape a sustainable future. Bridging these policy ideals with classroom realities requires evidence that is grounded in Nigerian schools. Such evidence will inform curriculum planners, teacher educators, and policymakers on how to align educational practice with the broader agenda of sustainable development. Ultimately, the school curriculum is a mirror of the society it intends to build. If Nigeria envisions a future that is environmentally resilient, socially just, and economically viable, then the learning experiences of its students must reflect that vision. Evaluating curriculum-based interventions is therefore not merely an academic exercise. It is an inquiry into whether education is fulfilling its responsibility to nurture citizens who can live within ecological limits, respect social diversity, and contribute to enduring prosperity. It is this concern that provides the impetus for the present study.

Nigeria's commitment to sustainable development is expressed in several national policies and international agreements to which the country is a signatory. The vision is clear: a nation where economic progress does not come at the expense of environmental health or social cohesion and where the younger generation is equipped to manage resources responsibly and live in harmony with diverse communities. Education has been identified as the primary vehicle for achieving this vision because it shapes the knowledge, values and practices that learners carry into adulthood [Adewumi & Akole, 2023]. Within education, the curriculum is expected to serve as the structured pathway through which these sustainability ideals are communicated and internalized. However, in practice, the Nigerian school system continues to produce graduates whose academic records do not always translate into the attitudes and actions required for sustainable living. Classrooms remain largely dominated by teacher-centered instruction that prioritizes the coverage of content for examination success. Lessons in Geography, Basic Science, Civic Education and Social Studies often treat environmental issues, social justice or economic prudence as topics to be memorized rather than as lived experiences to be explored. Consequently, many students can define concepts such as climate change or resource conservation, but they are unable to connect these concepts to their immediate environment or to make informed choices in their daily lives. This disjunction suggests that the curriculum, as currently implemented, is not effectively fostering the kind of

learning that sustainability demands [Kasindu & Ozor, 2018]. Attempts have been made to introduce curriculum-based interventions that are intended to bridge this gap. Some schools have experimented with project work on waste management, school gardens, energy-saving campaigns, or community service initiatives that are linked to subjects in the curriculum. Teacher training workshops have also been organized to build capacity for integrating sustainability themes into lesson delivery. While these efforts are commendable, their reach and depth remain inconsistent across the country. In many public and private secondary schools, the interventions are limited by inadequate instructional materials, insufficient teacher preparation and weak institutional support [Ibrahim, 2023]. Memereonye & Afam [2017] added that in other cases, the interventions exist as isolated activities that are not systematically linked to curriculum objectives, assessment, or school culture. The result is a fragmented approach where the potential of the curriculum to promote sustainable development is not fully realized.

The central problem, therefore, is the absence of clear empirical evidence on how effective these curriculum-based interventions actually are within the Nigerian context. It is not enough to assume that the inclusion of sustainability topics in textbooks or the organization of environmental clubs will automatically lead to sustainable attitudes and behaviours among students. Effectiveness must be measured against specific outcomes: the extent to which learners acquire relevant knowledge, develop pro-sustainability attitudes, and engage in practices that reflect responsible citizenship. Without such evaluation, curriculum planners and policymakers are left to make decisions based on assumptions rather than on data drawn from classrooms. This creates a risk of investing resources in interventions that may be pedagogically weak, contextually inappropriate, or unsustainable in the long term.

Furthermore, the challenge is compounded by the diversity of Nigerian schools. Public and private schools operate under different funding structures, teacher quality varies across regions and community expectations differ from one locality to another. [Uzundu, 2022] An intervention that works in a well-resourced private school may encounter serious constraints in an underfunded public school. If these contextual factors are not examined, curriculum reforms may inadvertently widen existing inequalities in educational outcomes. The problem is therefore not only whether curriculum-based interventions exist, but whether they are effective, equitable, and adaptable to the realities of Nigerian secondary schools. Until this problem is addressed through rigorous research, the gap between Nigeria's sustainable development aspirations and the actual outcomes of its education system will persist. Learners will continue to graduate with certificates but without the competencies needed to address pressing national challenges such as environmental degradation, social exclusion, and economic vulnerability. It is against this background that a systematic evaluation of the effectiveness of curriculum-based interventions in promoting sustainable development in Nigeria becomes imperative.

The broad objective of this study is to investigate the effectiveness of curriculum-based interventions in promoting sustainable development in Nigeria and specifically the study sought to;

1. to determine the extent to which curriculum-based interventions influence secondary school students' knowledge of and attitudes towards sustainable development in Nigeria.
2. to assess the effect of implementing curriculum-based interventions in promoting sustainable development in Nigeria

In line with the specific objectives, the following research questions were formulated to guide this study.

1. To what extent do curriculum-based interventions influence secondary school students' knowledge of and attitudes towards sustainable development in Nigeria?
2. What is the effect of implementation curriculum-based interventions on the promotion of sustainable development in Nigeria?

In consonance with the specific objectives and research questions, two hypotheses were postulated as follow;

H₀₁: There is no significant influence of curriculum-based interventions on secondary school students' knowledge of and attitudes towards sustainable development in Nigeria.

H₀₂: The implementation of curriculum-based interventions has no significant effect on the promotion of sustainable development in Nigeria.

Concepts

Curriculum-Based Interventions

Curriculum-based interventions refer to deliberate and systematic modifications within the school curriculum that are designed to embed specific knowledge, skills, values, and practices into teaching and learning processes. Unlike extracurricular programmes that operate outside the formal timetable, curriculum-based interventions are integrated directly into subjects, lessons and assessment structures, thereby ensuring that they reach all learners as part of their regular educational experience [Obizue & Obizue, 2025]. In the context of sustainable development, such interventions seek to reorient education from mere content transmission to a transformative process that prepares learners to understand, question, and respond to environmental, social, and economic challenges. The essence of curriculum-based interventions lies in their capacity to move learning beyond the textbook. They achieve this by infusing sustainability themes such as climate action, resource efficiency, social equity, and responsible citizenship into existing subject areas, and by adopting pedagogies that encourage inquiry, critical thinking, and community engagement. For instance, a Geography lesson may be extended to include local environmental mapping, while a Civic Education class may involve students in projects that address waste management or social inclusion within their communities. These experiences are structured to align with curriculum objectives while simultaneously fostering attitudes and behaviours that support sustainable living. In practice, curriculum-based interventions are effective only to the extent that they are supported by appropriate instructional materials, teacher competence, and institutional commitment

[Olayinka, 2024]. When teachers are equipped to mediate learning through problem-based, experiential, and participatory approaches, students are more likely to internalize sustainability principles and apply them in real-life contexts. Therefore, curriculum-based interventions represent a strategic response to the need for education to contribute meaningfully to national and global development goals by shaping learners who are knowledgeable, reflective, and action-oriented.

The Role of Teachers in Implementing Curriculum-Based Interventions

Teachers are central to the success of curriculum-based interventions because they translate curriculum policy into classroom practice. Their pedagogical decisions, attitudes and competencies determine whether sustainability concepts remain on paper or become lived experiences for students. [Adewumi & Akole, 2023]

Curriculum Integrators

Teachers infuse sustainability themes such as climate change, resource conservation, and social equity into existing subjects like Civic Education, Biology, and Geography. By connecting global goals to local realities, they ensure that sustainable development is not treated as an isolated topic but as a cross-cutting perspective across the curriculum. [Sterling, 2010]

Facilitators of Active Learning

Teachers shift from lecture-based teaching to learner-centered methods such as project-based learning, inquiry, and community engagement. This creates opportunities for students to investigate real environmental and social issues, thereby developing critical thinking and problem-solving skills needed for sustainable living. [UNESCO, 2017]

Models of Sustainable Practices

Through their conduct within the school, teachers model behaviors such as proper waste disposal, energy conservation, and respect for diversity. Students often emulate these practices, which reinforces the values promoted by curriculum-based interventions. [Olayinka, 2024]

Developers and Users of Instructional Materials

Teachers adapt and produce relevant instructional materials including charts, models, and digital resources that make abstract sustainability concepts concrete and relatable. Their ability to use and improvise materials directly influences students' comprehension and retention. [Nwachukwu & Okonkwo, 2021]

Assessors and Reflective Practitioners

Teachers design assessments that go beyond recall to measure students' attitudes and actions toward sustainability. Through continuous reflection on teaching strategies and student outcomes, they adjust interventions to improve effectiveness and relevance. [kasindu & Ozore, 2018]

Sustainable Development in Nigeria

According to Obizue & Obizue [2025], sustainable development in Nigeria refers to the process of meeting the country's present economic, social, and environmental needs in a way that preserves resources and opportunities for future generations. Given Nigeria's large population, dependence on natural resources, and developmental challenges, the concept has become central to national planning. The Brundtland Commission defined sustainable development as development that meets present needs without compromising the ability of future generations to meet their own needs, and this definition remains relevant to Nigeria's context where poverty reduction, industrial growth, and ecological protection must be pursued simultaneously.

In Nigeria, sustainable development is largely framed within the Sustainable Development Goals and the National Economic Empowerment and Development Strategy, which emphasize inclusive growth, environmental sustainability and social equity [Obizue & Obizue, 2025]. However, implementation has been constrained by factors such as rapid urbanization, oil dependency, deforestation, waste management problems, and limited institutional capacity. Education is therefore recognized as a critical tool for achieving sustainability, because it can influence values, attitudes and practices at the grassroots level. UNESCO [2017] noted that Education for Sustainable Development enables learners to understand complex sustainability issues and to take informed actions toward environmental stewardship and social responsibility.

For Nigeria, this means integrating sustainability into school curricula and community programmes so that young people develop the knowledge and skills to address local challenges such as climate change, resource depletion, and inequality. When learners are exposed to sustainability concepts through relevant curriculum-based interventions, they are better positioned to contribute to national efforts toward a more resilient and equitable society. [Olayinka, 2024]

Relationship between Curriculum-Based Interventions and Sustainable Development in Nigeria

The relationship between curriculum-based interventions and sustainable development in Nigeria is anchored on the fundamental premise that education is a transformative instrument for societal change. According to Obizue & Obizue [2025], sustainable development, as articulated in the 2030 Agenda, requires a population that understands the interdependence of environmental integrity, social inclusion and economic viability. Achieving this requires more than policy declarations; it demands that learners acquire the knowledge, values and competencies that enable them to act responsibly within their communities. The school curriculum provides the most structured and equitable platform through which this can be achieved because it reaches millions of learners during their most formative years. Consequently, curriculum-based interventions have become a critical linkage between Nigeria's educational system and its sustainable development aspirations. [UNESCO, 2017]

In the Nigerian context, the curriculum is expected to serve as a vehicle for translating global and national development goals into classroom experiences. Ezedi [2023] asserted that curriculum-based interventions operationalize this expectation by embedding sustainability concepts within subject content, instructional strategies and assessment practices. When Geography lessons extend beyond map reading to include local environmental degradation in the Niger Delta, or when Civic Education moves from definitions of citizenship to projects on community sanitation and social cohesion, the curriculum begins to function as more than an academic requirement. It becomes a medium through which learners encounter real-life sustainability challenges and develop the capacity to respond to them. In this sense, the effectiveness of curriculum-based interventions directly influences the extent to which education contributes to sustainable development outcomes in Nigeria [Mereonye & Afam, 2017]

The strength of this relationship is also evident in the way curriculum-based interventions shape learner dispositions. Nigeria faces pressing sustainability issues such as oil pollution, flooding, youth unemployment, and social fragmentation. Addressing these problems requires citizens who are not only informed but also disposed to act ethically and collectively. Curriculum-based interventions that employ participatory, experiential, and problem-solving pedagogies encourage students to question unsustainable practices, to appreciate cultural diversity, and to take responsibility for their environment. As students engage in school gardens, energy-saving campaigns, or peer education on climate change, they begin to internalize sustainability as a way of life rather than as examination content. The curriculum thus functions as the foundation upon which sustainable attitudes and behaviours are formed. [Adewumi & Akole, 2023]

However, the relationship is not automatic. The impact of curriculum-based interventions on sustainable development in Nigeria is mediated by several contextual factors. Ibrahim [2023] stated that where teachers lack the training to implement learner-centered approaches, where instructional materials are inadequate, or where schools are under-resourced, the curriculum's potential to promote sustainable development is weakened. In such situations, sustainability themes may be taught superficially or ignored entirely, resulting in a disconnect between what the curriculum intends and what students actually learn. This explains why, despite the inclusion of environmental and civic education in the Nigerian curriculum, many graduates still exhibit limited awareness and practice of sustainable living. The gap highlights the need to strengthen the implementation process if the curriculum is to fulfill its developmental role. [Nwachukwu & Okonkwo, 2021]

Ultimately, the relationship between curriculum-based interventions and sustainable development in Nigeria is reciprocal and developmental. A well-implemented curriculum produces learners who are equipped to address national challenges, while the realities of those challenges should in turn inform curriculum review and renewal. When curriculum-based interventions are effectively designed and supported, they contribute to building human capital that can sustain environmental resources, promote social equity, and drive inclusive economic growth. Therefore, the curriculum is not peripheral to Nigeria's development agenda; it is

central to it. The quality of curriculum-based interventions determines the quality of citizens produced, and by extension, the trajectory of the nation's sustainable development. [Obizue & Obizue, 2025]

Theories

Constructivist Learning Theory

Constructivist Learning Theory, advanced by Piaget and later extended by Vygotsky, posits that learners do not receive knowledge passively but actively construct meaning through interaction with their environment, peers, and teachers. [Piaget, 1952; Vygotsky, 1978] The theory emphasizes that learning is most effective when it is experiential, contextual, and socially mediated. Within the context of this study, Constructivism provides a strong foundation for understanding how curriculum-based interventions can promote sustainable development. If learners are to internalize sustainability concepts such as climate action, resource conservation, and social equity, they must be engaged in activities that allow them to explore, question, and apply these ideas to their immediate realities. When curriculum-based interventions are designed from a constructivist perspective, teaching shifts from teacher-centered transmission to learner-centered facilitation. Students participate in project work, community mapping, school gardens, and environmental campaigns that connect curriculum content to lived experiences. Through collaboration and reflection, they build deeper understanding and develop attitudes that support sustainable living. Thus, Constructivist Learning Theory explains why curriculum-based interventions that use inquiry and participatory methods are more likely to influence students' knowledge, attitudes, and practices than methods that rely solely on memorization. The theory therefore justifies the focus of this study on how the mode of curriculum implementation affects sustainability outcomes in Nigerian secondary schools. [Sterling, 2010]

Social Learning Theory

Social Learning Theory, proposed by Albert Bandura, argues that people learn behaviours, attitudes, and values by observing and imitating others within a social context. The theory identifies modeling, reinforcement, and self-efficacy as key processes through which learning occurs. In schools, teachers, peers, and school leaders serve as important models whose actions students observe and internalize. This makes Social Learning Theory highly relevant to curriculum-based interventions for sustainable development in Nigeria [Bandura, 1977]. Obizue & Obizue [2025] posited that if curriculum-based interventions are to produce sustainable practices, students must see sustainability modeled consistently in the school environment. When teachers demonstrate waste segregation, energy conservation, or inclusive classroom practices, students are more likely to replicate these behaviours. Similarly, when schools create a culture that rewards environmentally responsible actions, students' self-efficacy for engaging in sustainable practices increases. Social Learning Theory therefore explains the link between the implementation of curriculum-based interventions and students' engagement in sustainable practices beyond the classroom. It suggests that the effectiveness of

the curriculum depends not only on what is taught, but also on the social environment in which it is taught. This perspective is critical for evaluating curriculum-based interventions in Nigerian secondary schools, where school culture and teacher conduct significantly influence learner behaviour. [Olayinka, 2024]

Methodology

This study adopted a descriptive survey research design. The design was considered appropriate because it enables the researcher to collect quantitative data from a large population in order to describe, explain and evaluate the effectiveness of curriculum-based interventions as they currently exist in secondary schools. A survey design provides the opportunity to examine students' knowledge, attitudes and practices in relation to sustainable development without manipulating variables, thereby reflecting the natural state of curriculum implementation in Nigerian schools. The study was conducted in Owerri municipal council of Imo State, Nigeria. because it is an urban center with a mix of public and private secondary schools that are exposed to varying degrees of curriculum reforms, instructional resources and environmental challenges, making it suitable for investigating curriculum-based interventions for sustainable development.

The target population comprised all Senior Secondary School II students and teachers in public and private secondary schools in the municipal which the researcher could not accurately ascertain at the time of this study. SSS II students and teachers were chosen because they have been exposed to the senior secondary curriculum long enough to have experienced curriculum-based interventions, yet are not preoccupied with final examinations like SSS III students. 600 SSS II students and 50 teachers were selected, giving a total sample size of 650 respondents for the study. A multi-stage sampling procedure was employed. In stage one, 10 schools were selected using simple random sampling by balloting, with 5 public and 5 private schools to ensure representation. In stage two, 60 SSS II students were selected from each of the 10 schools using stratified random sampling based on gender to maintain proportionate representation. In stage three, 5 teachers were purposively selected from each school based on their involvement in teaching subjects related to sustainable development such as Civic Education, Biology, Geography and Basic Science. Data were collected using a structured questionnaire titled "Curriculum-Based Interventions and Sustainable Development Questionnaire" (CBISDQ). The instrument has three sections. Section A collected demographic information. Section B measured the extent of curriculum-based interventions and students' knowledge and attitudes using a 4-point rating scale of Strongly Agree, Strongly Agree, Disagree and Strongly Disagree. Section C assessed students' engagement in sustainable practices using a 4-point frequency scale of Very Often, Often, Rarely and Never. The instrument was face-validated by three experts in Curriculum Studies and Measurement and Evaluation from a university in Rivers State. A pilot test was conducted on 40 SSS II students and 10 teachers from two schools outside the study area but with similar characteristics and the data obtained were analyzed using Cronbach's Alpha coefficient, which yielded reliability indices of 0.85 for Section B and 0.83 for Section C. The overall reliability

coefficient of 0.84 indicated that the instrument was reliable for the study. Copies of the questionnaire were administered directly to the respondents by the researcher with the assistance of two trained research assistants and a high return rate was recorded. Research questions were answered using mean and standard deviation, with a criterion mean of 2.50 while the hypotheses were tested using inferential statistics. Hypothesis one was tested with a t-test and Hypothesis two was tested using Pearson Product Moment Correlation. All analyses were carried out at 0.05 level of significance using the Statistical Package for the Social Sciences, Version 26.

Results

This section presents the results of data collected from 600 SSS II students and 50 teachers, totaling 650 respondents in Owerri municipal. The return rate was 98.5% with 640 questionnaires found usable for analysis. Data were analyzed using mean, standard deviation, t-test and Pearson Product Moment Correlation at 0.05 level of significance, in line with the research questions and hypotheses stated in this study.

Demographic Characteristics of Respondents

Table 1: Distribution of Respondents by School Type and Gender

School Type	Male	Female	Total	Percentage
Public Schools	158	142	300	46.9
Private Schools	165	135	300	46.9
Teachers	24	26	50	7.8
Total	347	303	650	100.0

Table 1 shows that students were fairly distributed between public and private schools with 300 respondents each, representing 46.9% respectively. Teachers constituted 7.8% of the sample. Gender distribution was relatively balanced with 347 males and 303 females. This indicates adequate representation for generalization within the study area.

Research Question 1: To what extent do curriculum-based interventions influence secondary school students' knowledge of and attitudes towards sustainable development in Nigeria?

Table 2: Mean and Standard Deviation on Influence of Curriculum-Based Interventions on Students' Knowledge of and Attitudes towards sustainable development in Nigeria

Criterion Mean = 2.50; N = 600

S/N	Item Statement	Mean	SD	Decision
1.	Lessons on environmental protection have improved my understanding of climate change	3.12	0.74	Agreed
2.	Curriculum activities make me value resource conservation	2.98	0.81	Agreed
3.	I now see the connection between social equity and sustainable development	2.87	0.79	Agreed
4.	School projects have increased my positive attitude toward environmental cleanliness	3.05	0.72	Agreed
5.	I am more conscious of my role in promoting sustainable practices	3.01	0.76	Agreed
Cluster Mean		3.01	0.76	Agreed

Table 2 revealed that all items had mean scores above the criterion mean of 2.50. The cluster mean of 3.01 indicates that respondents agreed that curriculum-based interventions have a positive influence on students' knowledge of and attitudes toward sustainable development. The low standard deviations show consensus among respondents.

Hypothesis 1: There is no significant influence of curriculum-based interventions on secondary school students' knowledge of and attitudes toward sustainable development in Nigeria.

Table 3: t-test Analysis of Influence of Curriculum-Based Interventions on secondary school students' knowledge of and attitudes toward sustainable development in Nigeria

Variable	N	Mean	SD	df	t-cal	t-crit	P-value	Decision
Students exposed to interventions	320	3.15	0.68					
598	4.82	1.96	0.000					Rejected
Students less exposed	280	2.84	0.79					

Table 3 shows that the calculated t-value of 4.82 is greater than the critical t-value of 1.96 at df 598 and 0.05 level of significance. The P-value of 0.000 is less than 0.05. Therefore, the null hypothesis is rejected. This implies that there is a significant influence of curriculum-based interventions on secondary school students' knowledge of and attitudes toward sustainable development.

Research Question 2: What is the effect of implementation curriculum-based interventions on the promotion of sustainable development in Nigeria?

Table 4: Mean and Standard Deviation on the effect of implementation curriculum-based interventions on the promotion of sustainable development in Nigeria

Criterion Mean = 2.50; N = 600

S/N	Item Statement	Mean	SD	Decision
1	I participate in school waste recycling activities	2.76	0.84	Often
2	I switch off lights/fans when not in use at school	3.10	0.71	Often
3	I engage in tree planting or school gardening	2.54	0.89	Often
4	I educate my family/friends on environmental issues	2.68	0.81	Often
5	I avoid indiscriminate littering in and outside school	2.92	0.77	Often
Cluster Mean		2.80	0.80	Often

Table 4 revealed that the cluster mean of 2.80 is above the criterion mean of 2.50. This indicates that students often engage in sustainable practices. The results suggest that curriculum-based interventions are associated with behavioural outcomes.

Hypothesis 2: Ho₂: The implementation of curriculum-based interventions has no significant effect on the promotion of sustainable development in Nigeria.

Table 5: Pearson Correlation Analysis of Implementation and Sustainable Practices

Variables	N	Mean	SD	r-cal	P-value	Decision
Implementation of Interventions	600	3.01	0.76			
0.62 0.000 Rejected						
Students' Sustainable Practices	600	2.80	0.80			

Table 45 indicated a Pearson correlation coefficient $r = 0.62$ with a P-value of 0.000, which is less than 0.05. The r-value of 0.62 denotes a strong positive relationship. Consequently, the null hypothesis is rejected. This means that there is a significant positive relationship between the implementation of curriculum-based interventions and secondary school students' engagement in sustainable practices.

Discussion of Findings

The findings of this study indicate that curriculum-based interventions have a significant positive influence on secondary school students' knowledge of and attitudes toward sustainable development in Port Harcourt Metropolis. The cluster mean of 3.01 and the significant t-test result, $t(598) = 4.82$, $p < .05$, suggest that when sustainability concepts are embedded in the curriculum, students develop greater awareness of environmental issues, resource conservation and social equity. This supports the position of Sterling [2010], Mereonye & Afam [2023] and Ibrahim [2023] that a curriculum reoriented toward sustainability fosters deeper understanding beyond rote memorization.

Similarly, the study revealed a strong positive relationship between the implementation of curriculum-based interventions and students' engagement in sustainable practices, $r = .62$, $p < .05$. The cluster mean of 2.80 indicates that students often participate in practices such as recycling, energy conservation, and environmental advocacy. This aligns with Social Learning Theory which emphasizes that learners adopt behaviours they observe and experience within their school environment [Bandura, 1977]. Taken together, the findings imply that the effectiveness of curriculum-based interventions depends not only on content inclusion but also on how the curriculum is implemented through participatory teaching and school culture. The results are consistent with Osondu & Nwoke [2024] who noted that teacher readiness and institutional support determine the extent to which curriculum reforms translate into sustainable behaviours among learners.

The results generally support Constructivist and Social Learning Theories, which emphasize experiential learning and modeling of behaviour. The findings imply that when curriculum-based interventions are properly implemented, they contribute meaningfully to the

development of learners who are knowledgeable about, positively disposed to and actively engaged in sustainable development.

Conclusion

Based on the findings of this study, it can be concluded that curriculum-based interventions play a significant role in promoting sustainable development in Nigeria. Therefore, by implication, curriculum is effectively implemented, it serves as a critical instrument for achieving Nigeria's sustainable development goals through education. The failure to adequately implement these interventions will continue to limit the contribution of secondary education to national sustainability efforts.

Recommendations

Based on the findings and conclusion of this study, the following recommendations are made:

1. Government and school proprietors should organize regular in-service training and workshops for teachers on integrating sustainable development themes into their subjects using learner-centered methods. This will enhance teachers' competence to facilitate curriculum-based interventions effectively.
2. Schools should be provided with relevant instructional resources such as charts, models, digital media, and activity guides that make sustainability concepts practical and relatable. Availability of materials will improve students' understanding and retention of sustainability principles.
3. School authorities should institutionalize sustainable practices within the school environment through activities like recycling programs, energy-saving policies, and school gardening. When students see these practices modeled consistently, they are more likely to adopt them, in line with Social Learning Theory.
4. Curriculum planners at the Nigerian Educational Research and Development Council should explicitly embed and expand sustainability concepts across subjects rather than treating them as peripheral topics. This will ensure that all learners are exposed to knowledge, skills, and values for sustainable living.
5. Schools should partner with local communities, NGOs, and environmental agencies to engage students in real-life sustainability projects such as clean-up campaigns, climate awareness drives, and social inclusion activities. Such experiences will reinforce classroom learning and translate knowledge into action.

References

- Adewumi, M. & Akole, F. C. [2023]. Effective curriculum implementation and sustainable development in Nigerian education sector. *International Journal of Educational, Management Sciences and Professional Studies*, 2[2], 48–61.

- Bandura, A. [1977]. Social Learning Theory. Englewood Cliffs, NJ: Prentice Hall.
- Ezedi, O. [2023]. Curriculum development and educational outcome in Nigeria. *Journal of Curriculum Studies*, 10[3], 138–149
- Ibrahim, E. (2019). Re-engineering curriculum development and classroom effectiveness for sustainable quality education. *International Journal of Education, Management Sciences and Professional Studies*, 2(1), 128–140.
- Kasindu, C. O. & Ozor, A. [2018]. Influence of artificial intelligence in curriculum planning and implementation in Nigeria. *Journal of Curriculum Studies*, 12[2], 211–224.
- Mereonye, C. & Afam, O. M. [2017]. Curriculum innovation and sustainable development in Nigeria. *Curriculum Innovation and Sustainable Development in Nigeria Education*. 10[3], 278–289
- Obizue, E. C. & Obizue, M. N. [2025]. Educational management efficiency and sustainable economic development in Nigeria. *International Journal of Education, Management Sciences and Professional Studies*, 1[3], 253–267.
- Olayinka, S. [2024]. Education management and sustainable development in Nigeria. *Journal of Education and Humanity*, 6[1], 214–229.
- Osondu, E. & Nwoke, O. [2024] Curriculum development and students' performances in Nigerian tertiary institutions. *Journal of Education, Social and Management Sciences*, 2[1], 146–150.
- Piaget, J. [1952]. The Origins of Intelligence in Children. New York: International Universities Press.
- Sterling, S. [2010]. Learning for resilience, or the resilient learner? Towards a necessary reconciliation in a paradigm of sustainable education. *Environmental Education Research*, 16[5-6], 511–528.
- UNESCO. [2017]. Education for Sustainable Development Goals: Learning objectives. Paris: UNESCO Publishing.
- Uzundu, F. U. [2022]. Curriculum contents for quality education delivery and sustainable national development in Nigeria. *Journal of Issues and Practice in Education*, 15[2]. 261–276