Assessment of Sustainable Pedagogical Orientation and Practices of Secondary School Teachers in Osun State, Nigeria

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Introduction

Societies depend on educational systems to enhance their quality of life. Consequently, educational institutions design new architectural plans to support significant system transformations (Meira, 2020). UNESCO (2017), through its Education for Sustainability (EFS) initiative, presents an approach to handling complex situations, including planetary emergencies, with sustainable methods. Education is responsible for developing students' practical and theoretical knowledge, which will enable sustainable development through 2030. EFS transformation requires teachers and researchers to dedicate their efforts to motivate action that produces inventive solutions (Leal et al., 2018). The training of teachers needs to develop professionals who integrate critical thinking with creativity and proactive action and show sensible judgment. The purpose of EFS reaches beyond student career success because it develops competencies together with driving forces and ethical principles for supporting worldwide community welfare (Odell et al., 2019).

Educators serve as driving forces of change who deliver the required educational response to fulfil sustainable development targets, including all Sustainable Development Goals (SDGs) (UNESCO, 2017). The long-term sustainability of education processes along with educational institutions rests on how well educators integrate their knowledge with their competencies and their attitudes and values while managing their institutional frameworks as well as curricular structures (Zohaib et al., 2024). Basic teacher training serves as a global practice because educators believe it helps develop professional skills among teachers. The training system functions as an approach that supports teaching staff development through continuous progress and works toward equalizing various teacher preparation backgrounds and delivering updated education content to maintain teacher proficiency while allowing them to solve new educational challenges caused by environmental changes (Osamwonyi 2016). The method of developing attitudes along with essential knowledge and required behavior patterns—and skills for teachers to fulfil their occupational duties—constitutes in-service training.

The vital part of teacher education consists of in-service training. These training sessions, including lectures, films, exhibitions, conferences, seminars, and workshops, enable practical solutions and the development of requisite skills for addressing current challenges (Alkuş & Olgan, 2014; Osamwonyi, 2016). Teachers gain access to promising educational materials and advancements during these trainings, through which they obtain new curricular information along with innovative teaching approaches and particular educational equipment. These programs require clarification regarding their execution procedures and whether teachers receive methods that help them share their gained knowledge effectively with their students. According to Amadi (2013), in-service training activities in Nigeria have gained popularity as a solution against pre-service training deficiencies, yet teachers remain unprepared for instructional modifications and material evolution. This research analysis links inadequate educational outcomes of schools to the training methods teachers receive

because these theoretical approaches force instructors to simply listen without implementing their fresh teaching strategies.

Teacher training for current educators reveals many deficiencies in most developing nations because learning programs do not provide effective teachable educational skills, according to Chanda (2024). Developing world leaders adopted the "train the teacher, train the nation" approach that led governments to neglect their responsibility while granting teachers full power to run the teaching-learning process for the nation. According to Zaslow (2014), proper planning along with implementation determines what makes in-service teacher training effective. To gather effective results from the training program, educators must conduct a pre-training evaluation and present themselves to trainees while explaining the objectives and expected outcomes and stressing the importance of learning content material and real-world application (Dunst et al., 2015; Ficarra & Quinn, 2014). Program success requires an accurate feedback system between training modules and authentic experience implementation using reflective assessment (Ficarra & Quinn, 2014).

All education and professional training for educators should direct their efforts toward ESD principles per international declarations and national policy papers (UNESCO, 2009). Educational institutions implementing ESD have demonstrated that teacher backing acts as the essential foundation to effectively synchronize ESD strategies with societal needs (UNESCO, 2014). 21st-century educators must maintain a solid, deep understanding across their teaching subjects for effective student needs assessment. All teachers should own subject content knowledge, which represents their accumulated understanding developed from their specialized education area. The core component of professional competence for teachers exists in their subject matter knowledge (Ballet et al., 2018). Shulman (2016) asserted that the teacher needs to understand the essence and comprehend the rationale behind it. Instructive educators must maintain current notions of teaching and learning while acquiring different data-driven teaching approaches with practice implementation methods for the classroom (Abramczyk & Jurkowski, 2020). Subject content knowledge at a limited level makes it difficult for teachers to properly address learner questions while clearing up misconceptions about the subject matter during cognitively challenging learning situations (Gama, 2015).

Without new competencies and skills, teachers will not be able to meet rising demands in the 21st century regarding their tasks, according to Barrios (2021). To properly teach content, teachers must have a complete understanding of what they need to deliver along with accompanying interpretation skills for achieving policy compliance. The approach leads teachers to focus primarily on delivering content without ensuring learner understanding, according to Bertram et al. (2021). Teachers have multiple responsibilities, including impacting knowledge while also guiding students in their learning processes (Petrov & Volkov, 2023). The current generation of teachers needs training that focuses on concept construction and development of epistemological, emotional, and operational skills as emphasized by Petrov & Volkov (2023). Life orientation forms part of the curriculum that school teachers handle without subject expertise because the school schedule demands it.

The role of education in the achievement of sustainable development goals cannot be overemphasized. Secondary education plays a critical role in shaping the minds of future generations and preparing them to address the complex challenges of the 21st century. This level of education provides students with the knowledge, skills, and values necessary for future success. However, it is disheartening to note that the quality of education in Nigeria

has been a subject of concern in recent years. The country faces various challenges in its educational system which include inadequate funding, limited teacher education institutions, inadequate qualified teachers, climate change, poor administrative support, poor infrastructure, and limited resources (Ogunode, & Paul, 2021; Adewale et al., 2024; Shogbesan et al., 2024; Olorunda 2022). These challenges hinder the ability of the teachers to provide the needed high-quality education that prepares the learners for the demands of the 21st century. Moreover, there is a dearth of research on 21st-century and sustainable pedagogy in the Nigerian context, particularly at the secondary school level.

Research Objectives. The following objectives will guide this study:

1. To investigate secondary school teachers in Osun State, Nigeria, regarding their sustainable pedagogical orientations.
2. To examine prominent sustainable pedagogical practices used by secondary school teachers in Osun State, Nigeria.
3. To assess the possible challenges associated with the integration of sustainable pedagogical practice in schools among teachers, in Nigeria.
4. To investigate gender differences in the sustainable pedagogical orientations of secondary school teachers in Osun State, Nigeria.

Research Questions.

1. What are the sustainable pedagogical orientations of secondary school teachers in Osun State, Nigeria?
2. What are the prominent sustainable pedagogical practices used by secondary school teachers in Osun State, Nigeria?
3. What are the possible challenges associated with the integration of sustainable pedagogical practice in schools among teachers, in Nigeria?

Research Hypothesis. There is no significant gender difference in the sustainable pedagogical orientations of secondary school teachers in Osun State.

Methodology

Research Design. The descriptive survey research design was utilized to study sustainable pedagogical orientation and practices of secondary school teachers in Osun State secondary schools in Nigeria. The researchers employed multi-stage sampling, using the purposive sampling method to select three local government areas, namely Olorunda, Oriade, and Ife Central. The local government areas were in the southwestern part of the state. Education is highly valued by the people in the area. There are both public and private secondary schools with a significant number of male and female students enrolled in the schools. 10 schools were selected from each of the three local government areas with a total of 30 schools with the use of a convenience sampling approach. A simple random sampling method was adopted to choose 60 teachers from all the 30 schools located within the three local government areas, totalling 180 participants for the research.

Research Instrumentation. The questionnaire for data collection consisted of four sections, which included demographic details followed by items measuring sustainable pedagogical orientations, sustainable practices, and possible challenges. The response format adopted was a four-point Likert-type scale. The items on the instrument were subjected to content validity through measurement expert review, and its reliability was established through a pilot test using a test-retest approach. The results obtained showed a high Pearson correlation

coefficient of 0.81 (sustainable pedagogical orientations), 0.89 (sustainable practices) and 0.87 (possible challenges associated with integration) respectively for each section.

Data Collection and Analysis. The study duration spanned two weeks until receiving 100% of the questionnaires. The research team followed all necessary ethical protocols, including obtaining informed consent and maintaining participant confidentiality. The collected data were coded into the SPSS spreadsheet and computed into a single measure of the constructs which each section measured. The researchers analyzed the obtained data using descriptive methods that produced frequencies as well as percentages alongside mean scores and standard deviations to explore the teachers' perspectives about their sustainable pedagogical orientations, practices, and encountered challenges. The independent sample t-test was used to analyze the hypotheses. Given the nature of the data obtained, these statistics were adopted to help appropriately provide answers to the research questions raised as well as appropriately test the hypothesis generated. The researcher used SPSS for analysis to guarantee results accuracy while the hypothesis was tested at 0.05 level of significance.

Results

Table 1
Respondent Distribution by Gender (n=180)

Gender	F	%
Male	92	51.1
Female	88	48.9
Total	180	100.0

Table 1 presents the gender distribution of respondents. It shows that 51.1% are male while 48.9% are female. This implies that just over half of the respondents are male with nearly as many being female.

Analysis

Research Question Research Question 1: What are the sustainable pedagogical orientations of secondary school teachers in Osun State, Nigeria?

Table 2
Analysis of the Sustainable Pedagogical Orientations of Secondary School Teachers in Osun State (n=180)

S/N	ITEMS	RESPONSE					Mean	SD
		Always	Sometimes	Often	Rarely	Never		
		F %	F %	F %	F %	F %		
1	I prioritize incorporating sustainable development concepts into my teaching methods.	120 66.7%	35 19.4%	19 10.6%	2 1.1%	4 2.2%	4.47	0.89

2	I actively seek to utilize teaching materials that emphasize environmental sustainability in my lessons.	107 59.4%	36 20.0%	29 16.1%	6 3.3%	2 1.1%	4.36	0.89
3	I integrate discussions on social and economic sustainability within the context of my subject matter when teaching.	116 64.4%	35 19.4%	23 12.8%	5 2.8%	1 0.6%	4.44	0.86
4	I believe it is important to foster a sense of environmental responsibility among my students through my teaching.	117 65.0%	43 23.9%	13 7.2%	7 3.9%	Nil	4.50	0.79
5	I incorporate real-world examples of sustainable practices into my teaching but guided by curriculum.	123 68.3%	32 17.8%	20 11.1%	3 1.7%	2 1.1%	4.52	0.80
6	I encourage critical thinking about global issues related to sustainability in my classroom instructions.	101 56.1%	40 22.2%	33 18.3%	6 3.3%	Nil	4.31	0.89
7	I adapt my teaching methods to promote a sustainable mindset among students.	130 72.2%	24 13.3%	25 13.9%	1 0.6%	Nil	4.57	0.75
8	I collaborate with fellow teachers to share and develop sustainable teaching practices.	99 55.0%	50 27.8%	26 14.4%	5 2.8%	Nil	4.35	0.83
9	I consider the long-term impact of my teaching strategies to ensure that it promotes students' awareness of sustainable practices.	104 57.8%	46 25.6%	28 15.6%	2 1.1%	Nil	4.40	0.79
10	I incorporate sustainability premises to prepare students to be responsible global citizens.	132 73.3%	30 16.7%	14 7.8%	4 2.2%	Nil	4.61	0.73

Table 2 presents the analysis of the sustainable pedagogical orientations of secondary school teachers in Osun State. Accordingly, the majority of the teachers responded that they always and sometimes prioritize incorporating sustainable development concepts into their teaching methods (86.1%); actively seek to utilize teaching materials that emphasize environmental sustainability in their lessons (79.4%); integrate discussions on social and economic sustainability within the context of their subject matter when teaching (83.8%), among others. Also, they majorly believe it is important to foster a sense of environmental responsibility among students through their teaching (88.9%), and incorporate real-world

examples of sustainable practices into their teaching but guided by the curriculum (86.1%). They encourage critical thinking about global issues related to sustainability in their classroom instructions (78.3%). Moreover, they mostly adapt their teaching methods to promote a sustainable mindset among students (85.5%), collaborate with fellow teachers to share and develop sustainable teaching practices (82.8%), consider the long-term impact of their teaching strategies to ensure that it promotes students' awareness of sustainable practices (83.4%), and they incorporate sustainability premises to prepare students to be responsible global citizens (90.0%). Hence, this implies that most of the teachers have a positive, sustainable pedagogical orientation.

Research Question 2: What are the prominent sustainable pedagogical practices used by secondary school teachers in Osun State, Nigeria?

Table 3

Analysis of the Prominent Sustainable Pedagogical Practices Used by Secondary School Teachers in Osun State (n = 180)

S/N	ITEMS	RESPONSE					Mean	SD
		Always	Sometimes	Often	Rarely	Never		
		F %	F %	F %	F %	F %		
1	I actively incorporate environmental conservation themes related to my subject matter when identifying lesson plans.	109 60.6%	44 24.4%	22 12.2%	2 1.1%	0 0.0%	4.43	0.81
2	I employ sustainable practices, such as reducing paper usage and promoting digital resources when developing my instructional aids.	104 57.8%	44 24.4%	22 12.2%	10 5.6%	0 0.0%	4.34	0.90
3	I engage students in discussions of social justice and equity as part of sustainable education during my teaching or classroom instructions.	107 59.4%	40 22.2%	21 11.7%	8 4.4%	2 1.1%	4.34	0.94
4	I use experiential learning, including field trips and outdoor activities, as a sustainable teaching practice.	121 67.2%	27 15.0%	16 8.9%	8 4.4%	6 3.3%	4.36	1.10
5	I consistently integrate community-based projects that promote sustainability into the curriculum.	132 73.3%	36 20.0%	5 2.8%	7 3.9%	0 0.0%	4.63	0.72

6	I employ sustainable pedagogical practices, such as project-based learning, which are well-established in my school.	124 68.9%	37 20.6%	13 7.2%	6 3.3%	0 0.0%	4.55	0.77
7	I actively incorporate diverse perspectives on sustainable development in their teaching materials.	112 62.2%	43 23.9%	17 9.4%	5 2.8%	2 1.1%	4.42	0.90
8	I employ interdisciplinary approaches that connect sustainability with various subjects commonly used by teachers.	101 56.1%	50 27.8%	17 9.4%	6 3.3%	6 3.3%	4.30	1.00
9	Teachers collaborate with local organizations and experts to enhance students' understanding of sustainable issues.	89 49.4%	55 30.6%	13 7.2%	17 9.4%	6 3.3%	4.13	1.11
10	I actively pursue and value professional development opportunities related to sustainable teaching practices in my school.	112 62.2%	42 23.3%	11 6.1%	7 3.9%	8 4.4%	4.35	1.06

Table 3 presents the analysis of the prominent sustainable pedagogical practices used by secondary school teachers in Osun State. The prominent sustainable pedagogical practices used always by secondary school teachers were that they consistently integrate community-based projects that promote sustainability into their curriculum and employ sustainable pedagogical practices, such as project-based learning. This implies that they encourage students to engage in community-based projects that will help promote sustainability. However, from their responses, most of the teachers still need to improve on the practices of collaboration with local organizations and experts to enhance students' understanding of sustainable issues.

Research Question 3: What are the possible challenges associated with the integration of sustainable pedagogical practice in schools among teachers in Nigeria?

Table 4

Analysis of the Possible Challenges Associated with Integration of Sustainable Pedagogical Practice in Schools among Teachers (n=180)

S/N	**ITEMS**	**RESPONSE**					**Mean**	**SD**
		Always	Sometimes	Often	Rarely	Never		
		F %	F %	F %	F %	F %		
1	Lack of time for lesson planning and curriculum development hinder the	100 55.6%	43 23.9%	19 10.6%	10 5.6%	8 4.4%	4.21	1.12

	integration of sustainable pedagogical practices.							
2	Limited access to relevant and updated teaching resources on sustainability poses a challenge for teachers.	105 58.3%	43 23.9%	23 12.8%	7 3.9%	2 1.1%	4.34	0.92
3	Teachers feel adequately supported by school administration in incorporating sustainable practices into their teaching.	101 56.1%	45 25.0%	21 11.7%	12 6.7%	1 0.6%	4.29	0.96
4	There is a perceived lack of training and professional development opportunities related to sustainable pedagogy.	96 53.3%	49 27.2%	22 12.2%	8 4.4%	5 2.8%	4.24	1.02
5	Teachers believe that standardized testing and assessment structures discourage the incorporation of sustainability into the curriculum.	104 57.8%	41 22.8%	16 8.9%	10 5.6%	9 5.0%	4.23	1.14
6	Limited collaboration opportunities with colleagues hinder the exchange of sustainable teaching practices.	104 57.8%	47 26.1%	19 10.6%	7 3.9%	3 1.7%	4.34	0.94
7	Insufficient recognition or rewards for teachers who actively integrate sustainability into their teaching demotivate such efforts.	98 54.4%	48 26.7%	22 12.2%	9 5.0%	3 1.7%	4.27	0.97
8	Teachers face resistance or skepticism from students or parents regarding the value of sustainable pedagogical practices.	107 59.4%	38 21.1%	19 10.6%	11 6.1%	5 2.8%	4.28	1.06
9	There is a perceived lack of alignment between sustainability-related topics and standardized curricular requirements.	106 58.9%	41 22.8%	18 10.0%	8 4.4%	7 3.9%	4.28	1.07
10	Inadequate infrastructure and resources, such as technology and facilities, impede the effective implementation of sustainable teaching practices.	127 70.6%	37 20.6%	6 3.3%	3 1.7%	7 3.9%	4.52	0.94

Table 4 presents the analysis of the possible challenges associated with the integration of sustainable pedagogical practice in schools among teachers. Based on their responses, the possible challenges associated with the integration of sustainable pedagogical practice in schools among teachers always were associated with time management during lesson planning and curriculum implementation, access to relevant and updated teaching resources on sustainability, lack of adequate support from school authorities, perceived lack of training and professional development opportunities related to sustainable pedagogy, among others as stated. Prominently, they identified inadequate infrastructure and resources, such as technology and facilities as an impediment to the effective implementation of sustainable teaching practices. Hence, it is imperative to consider addressing these challenges to help improve sustainability in schools and society at large.

Analysis of Research Hypotheses

Research Hypotheses 1: There is no significant gender difference in the sustainable pedagogical orientations of secondary school teachers in Osun State.

Table 5
Summary of Independent Sample T-Test Analysis Showing Gender Difference in the Sustainable Pedagogical Orientations of Secondary School Teachers in Osun State

	N	Mean	SD	T	df	Sig. (2-tailed)	Remark
Male	92	34.6	8.84	3.877	198	0.000	Significant
Female	88	23.9	0.51				

Table 5 presents the summary of the t-test analysis to know if there is a significant gender difference in the sustainable pedagogical orientations of secondary school teachers in Osun State. The result showed that there is a significant gender difference in the sustainable pedagogical orientations of secondary school teachers in Osun State ($t = 3.877$, $df = 198$, $p < 0.05$). Hence, it can be concluded that males have a more positive sustainable pedagogical orientation than female teachers.

Discussion of Findings

The findings suggest that the majority of secondary school teachers from Osun State show significant commitment to sustainable teaching approaches based on their positive responses to integrating sustainability education (Mean = 4.47, SD = 0.89). Teachers support Nigeria's national educational framework which allows environmental awareness and sustainability lessons to be integrated into educational programs including both the National Policy on Environment from 2016 and the National Policy on Education from 2013. According to the research, teachers believe that students need to develop environmental responsibility (Mean = 4.50, SD = 0.79), and teaching approaches must be modified to cultivate a sustainability mindset (Mean = 4.57, SD = 0.75). The survey data reveals that teachers show increasing recognition of how education supports sustainable development as per the global Sustainable Development Goal (SDG 4.7).

However, the level of stability in measurements based on standard deviations indicated that teachers display a strong commitment to environmental sustainability, while some educators encounter difficulties in incorporating these concepts because of inflexible school curricula

and insufficient educational funds. Professional development programs need to be designed specifically to build education skills regarding sustainability among teaching professionals. Teachers in Osun State used sustainable pedagogical approaches as part of their teaching practice. Educators in Osun State mainly utilize two sustainable pedagogical approaches: they use sustainability-focused, community-based projects (Mean = 4.63, SD = 0.72) and conduct project-based learning activities (Mean = 4.55, SD = 0.77). The research data demonstrates that teachers have internalized the importance of hands-on learning approaches for building sustainable consciousness in their students. This study reflects sustainability-related research carried out in developing nations which demonstrates that practical environmental initiatives promote student involvement and understanding.

The scores for sustainability-driven teaching strategies were high, but collaborating with local organizations and sustainability experts demonstrated poor performance with a mean of 4.13 and standard deviation of 1.11. The lack of structured policies which support school-industry collaborations appears to be the main reason behind this situation in Nigeria. The implementation of sustainability education needs improvement because real-world sustainability activities remain unavailable to students. Although Nigerian teachers demonstrate high levels of dedication to sustainability, they encounter multiple barriers which prevent them from completely implementing sustainable learning approaches. The main obstacle identified is the deficiency of hardware resources such as technology combined with insufficient facilities (Mean = 4.52, SD = 0.94). The education sector analysis of Nigeria demonstrates that inadequate facilities represent a main barrier to successful curriculum execution. As identified factors that prevent full pedagogical integration of sustainability teaching professionals in Nigeria experience difficulties because of (1) teaching resource scarcity for sustainability topics (Mean = 4.34, SD = 0.92), (2) insufficient training for sustainable teaching practices (Mean = 4.24, SD = 1.02), and (3) sustainability curricula's variation from standardized national curricula (Mean = 4.28, SD = 1.07).

The educational structure in Nigeria develops limitations because of restrictive educational standards and standardized testing requirements which stop teachers from teaching sustainability principles. The solution requires activities through policies which support educator development together with adaptable teaching methods and sustainable educational material funding. The research conducted a test of the hypothesis regarding gender-based differences in sustainable pedagogical orientations among Osun State teachers. The analysis reveals a significant statistical difference ($t = 3.877$, $p = 0.00$) because male teachers held Mean = 34.6, SD = 8.84 sustainable pedagogical orientations higher than female teachers who scored Mean = 23.9, SD = 0.51.

The discovery stands against research from around the world which indicates female instructors tend to support sustainability-based education because of their caretaking roles in academic environments. The unequal gender ratio in Osun State teaching staff can be explained by the way male teachers dominate STEM subjects which naturally connects to sustainability issues. The students' capabilities to infuse sustainability principles into their teaching practice depend on their access to gender-related professional development possibilities. A substantial inequality exists between males and females implementing ecological teaching skills which calls for gender-specific interventions to provide equal sustainability education programs and empower education staff equally.

Limitations of the Study

While the research contributes vital knowledge about sustainable pedagogical approaches in Osun State, it has several restrictive ability factors that researchers should consider.

1. The study focused on 180 teachers in Osun State while excluding the entirety of Nigerian teachers thus creating possible limitations in generalization. The research could achieve stronger international validation if future analyses add participants from different states throughout Nigeria.
2. The study depended on teachers to report their practices themselves although this data could contain potential response biases. Studies that use observational methods will provide better accuracy in determining sustainable teaching practices.
3. This study presents teachers' existing orientations however it does not provide continuous measurement of sustainable practices because their development takes place across time. A research study carried out over time would show how orientations transform when policies evolve and training programs are implemented.

Practical Implications

Implementations emerging from this research establish critical ramifications that educational stakeholders together with policymakers require among all teacher-training institutions throughout Nigeria.

1. Multiple teachers encounter difficulties when teaching sustainability; thus, professional development programs should focus on delivering effective training to address this need. Sustainability education should become an essential part of the curriculum of training colleges that prepare teachers.
2. The Nigerian curriculum needs modification to provide teachers with better opportunities when incorporating sustainability education into their lessons. Standardized student assessments with sustainability competencies should become mandatory because this will motivate educators to integrate these topics into their educational activities.
3. The government needs to fund institutions with essential facilities along with digital instruments and updated sustainability educational resources to advance educational methods.
4. Educational institutions need to create formal alliances between their faculty sustainability organizations and industry professionals to deliver practical learning opportunities to students.
5. The government must establish identical professional development possibilities for teachers of both genders to eliminate differences in sustainability-focused instructional strategies between men and women teaching staff.

Conclusion

The research establishes that sustainable pedagogical approaches maintain critical importance for all secondary educational institutions within Osun State, Nigeria. The research indicates that educators at secondary schools understand sustainability concepts well but face multiple challenges in implementing them in practice. Teacher adoption of effective sustainable pedagogy remains limited because they lack suitable training opportunities and development resources face institutional failure, and standardized curricula fail to integrate sustainability elements. The study proves that educator training during active service continues to be

essential due to its ability to generate professional development that helps teachers face modern teaching obligations.

Evidence shows teachers wish to incorporate sustainable practices in teaching, although numerous obstacles prevent them from doing so effectively. The sustainability goals face obstacles because teachers often struggle with insufficient time for planning lessons and lack adequate space to work together while also dealing with insufficient resources. Teachers' emotional standpoints on sustainability show substantial differences between genders, which indicates gender likely determines how sustainability is included in learning methods.

The study presents various recommendations to handle these issues that stand in the way of progress. Schools require robust training programs dedicated to sustainable teaching methods that combine direct teaching methods with modern teaching resources for instructors. Sustainable teaching practice implementation needs supportive funding along with infrastructure advancement because these elements create essential resources for its success. The curriculum framework must receive modifications to support sustainable learning instructions through enhanced education standards that grant teachers space to teach sustainability while avoiding standardized testing restrictions.

Sustainable education development needs holistic strategies that combine teacher empowerment with systematic changes that eliminate sustainability practice roadblocks. Educational organizations and stakeholders should prioritize training programs for teachers, adequate resource spending, and curricula reforms to establish an educational system that develops students with skills for sustainable development. This research shields important knowledge, which lets education stakeholders develop sustainable teaching methods that support Sustainable Development Goal achievement.

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