Sustainable TVET Practices for Enriching the Quality of Technical Teacher Education in Nigeria

by

[1]Okeowo, Odunayo Sunday, [2]Ayeoribe, Toyin Samuel &[1]Okeowo, Rebecca Oyenike, [3]Ismaila, Ibrahim Ushe, [2]Adebesin, Isikilu Lucky

[1]DEPARTMENT OF TECHNOLOGY EDUCATION, LAGOS STATE UNIVERSITY OF EDUCATION OTO/ IJANIKIN, LAGOS

[2]FEDERAL COLLEGE OF EDUCATION (TECH.) AKOKA, YABA LAGOS

[3]DEPARTMENT OF INDUSTRIAL TECHNICAL EDUCATION, WAZIRI UMARU FEDERAL POLYTECHNIC, BIRNIN KEBBI KEBBI STATE

Abstract

This paper explored the critical role of sustainable practices in enriching the quality of technical teacher education. The integration of sustainability into TVET is essential for aligning education with the demands of a rapidly changing economy. The descriptive survey design was adopted. Two research questions guided the study. The population for the study was 384, which comprised lecturers in colleges of education, polytechnics and universities. Structured questionnaire consisting of two parts, with five-point Likert scale was used to elicit responses from subjects. The instrument face validation was done by three experts in the department of industrial technical education of University of Nigeria, Nsukka. The Mean and Standard deviation were used to answer the research questions with a decision rule of 3.50. The findings of the study among others revealed that there is a strong need for the integration of environmental sustainability, renewable energy technologies, adoption of best international practises and industry-partnership into technical teacher education curricula in order to improve their practical skills. Identified challenges were lack of up-to-date infrastructure, non-availability of modern teaching materials and resources. It was amongst other things recommended that government should develop and implement policies that mandate the integration of sustainability into TVET curricula with regular review.

Keywords: Sustainable TVET practices, technical teacher education, Institutional factors, Professional development.

Introduction

Technical and Vocational Education and Training (TVET) is essential for developing a skilled workforce capable of enhancing economic growth and technological innovation in Nigeria, where youth unemployment remains a significant challenge. Promoting TVET can play a major role in addressing this issue. The sustainability of TVET practices, particularly in technical teacher education, is essential to ensure the continuous improvement of the quality and relevance of education provided.

Sustainable TVET practices involve embedding environmental, economic, and social considerations into the education process by ensuring that the training provided meets the needs of the present without compromising the ability of future generations to meet their own needs (UNESCO, 2017). Sustainable practices in TVET involve a comprehensive approach that revolved around the principles of sustainability across all aspects of vocational education. This includes environmental sustainability, which focuses on the efficient use of resources and minimizing waste; economic sustainability, which aims at ensuring long-term viability through cost-effective and relevant training; and social sustainability, which emphasizes inclusivity and the development of skills that contribute to societal well-being (Ogbuanya & Okoro, 2018). The sample of sustainable TVET

initiatives can be seen in Germany's dual education system, which combines classroom instruction with practical industry experience, which ensure that students acquire skills that are immediately applicable in the job market (Rauner, 2020).

Technical teacher education in Nigeria is afflicted with several challenges that hamper the implementation of sustainable TVET practices. One significant issue is the outdated curricula and teaching methods that do not conform with current industry needs or technological advancements. Many technical institutions in Nigeria still use curricula that were developed decades ago, failing to incorporate new trends in technology and sustainability (Ajiboye, 2021). Lack of continuous professional development opportunities for technical educators is another factor, which limits their ability to stay updated with industry trends and new teaching methodologies (Obi, 2022). A major challenge hampering the development of technical education is the insufficient collaboration between educational institutions and industries which creates a dichotomy between the skills taught in TVET institutions and the skills demanded by employers, leading to unsuitability of graduates in the labour market.

Resource constraints, such as inadequate funding, outdated equipment, and poor infrastructure, further fuelled the challenges faced by technical teacher education in Nigeria by adopting the following: {a}The curriculum must be reformed to integrate sustainability concepts and emphasize skills for the green economy. This involves updating course content to include emerging technologies, sustainable industrial practices, and environmental stewardship. By doing so, technical educators can equip students with the knowledge and skills required to contribute to a sustainable future (Adebayo & Olaniyi, 2020). {b}Continuous professional development (CPD) programmes should be given to technical educators so as to remain relevant in their fields. These programmes should focus on training educators in the use of sustainable technologies and teaching methods. It should comprise workshops and seminars on renewable energy technologies, waste management, and sustainable manufacturing processes in conjunction with industry experts (Ezeani & Urama, 2019). {c}Enhanced collaboration between TVET institutions and industries is important for ensuring that the training provided is conformity with industry needs. Establishing partnerships with sustainable industries can provide opportunities for internships, apprenticeships, and hands-on training, allowing students to gain practical experience in a real-world environment. Industry-led workshops and seminars can expose both educators and students to the latest trends and practices in sustainable technologies (Okoye & Arimonu, 2016). {d}Efficient use of resources within educational institutions is necessary for sustainability. This includes utilizing renewable resources, such as solar energy, and promoting the efficient use of materials and energy in training facilities. For example, technical institutions can implement waste reduction programmes, water conservation measures, and energy-efficient practices within their operations, setting an example for students to follow in their professional lives (Oladipo, 2021). Sustainable practices in technical teacher education have the potential to adequately improve the quality of education provided. By integrating sustainability into the curriculum, educators can ensure that students are equipped with the skills and knowledge necessary for survival in a rapidly changing world. This, in turn, enhances student outcomes and employability, as graduates are better prepared to meet the demands of the modern workforce. More so, sustainable practices contribute to the long-term viability of educational institutions. By adopting cost-effective and resource-efficient practices, institutions can reduce operational costs and improve their financial sustainability. In addition, the focus on sustainability can positively influence community development by promoting

environmentally responsible behaviour and fostering a culture of innovation and problem-solving (Olawale & Ayodele, 2018).

In spite of the odds, some Nigerian higher institutions have begun to integrate sustainable practices into their TVET programmes with positive results. For example, the Yaba College of Technology has implemented a renewable energy programme that trains students in solar panel installation and maintenance, thereby closing the skills gap in the renewable energy sector and contributing to environmental sustainability (Oni, 2023). In the same vein, the Federal University of Technology, Akure (FUTA), has incorporated sustainability into its engineering curriculum, focusing on green engineering practices and sustainable development (Adeola & Oluwaseun, 2022). These initiatives have not only improved the quality of technical education but have also enhanced the employability of graduates, as they are now equipped with relevant skills that are in high demand in the labour market. The success of these programs highlights the potential benefits of integrating sustainability into TVET and technical teacher education across Nigeria.

Statement of the Problem

The quality of Technical and Vocational Education and Training (TVET) in Nigeria, particularly within the context of technical teacher education, is facing significant challenges that undermine its effectiveness in producing a skilled and employable workforce. Despite the critical role that technical education plays in economic development, many Nigerian TVET institutions struggle with outdated curricula, inadequate teacher training, and limited industry collaboration. Moreover, the lack of emphasis on sustainability within these programmes further exacerbates these challenges, leaving graduates ill-prepared to meet the demands of a rapidly evolving job market, particularly in sectors requiring green skills and sustainable practices.

As the global economy increasingly prioritizes sustainability, there is an urgent need for Nigerian TVET institutions to integrate sustainable practices into technical teacher education. However, the process of embedding these practices faces obstacles, including insufficient resources, lack of institutional support, and creates a margin between educational programmes and industry needs. This gap highlights the need for a comprehensive approach to reforming technical teacher education in Nigeria, one that not only enhances the quality of education but also aligns it with global sustainability trends. Addressing this problem is critical for ensuring that Nigeria's TVET system can produce competent educators who are capable of imparting relevant, up-to-date skills to their students. By identifying the barriers to and opportunities for integrating sustainable practices into technical teacher education, this study aims to provide actionable insights that can inform policy and practice, ultimately leading to an enriched educational experience and improved employability for graduates.

Purpose of the Study

The general purpose of this study was to examine quality of technical teacher education through sustainable TVET practices in Nigeria. Specifically, the study sought to:

1. explore how the incorporation of sustainable practices into TVET programmes can improve the quality of technical teacher education in Nigerian higher institutions.
2. identify the challenges and opportunities associated with implementing sustainable TVET practices in the context of technical teacher education in Nigeria.

Research Questions

1. How can sustainable practices be effectively integrated into technical teacher education to enhance the quality of TVET in Nigerian higher institutions?
2. What are the main challenges in implementing sustainable TVET practices within the framework of

technical teacher education in Nigeria?

Methodology

This study adopted a descriptive survey design to assess sustainable TVET practices in enriching the quality of technical teachers' education in Nigeria. The design was chosen because it allowed for the collection of data from a large population, making it possible to describe the current practices, attitudes, and opinions of their respondents. The population of this study consisted of all technical teachers in colleges of education, polytechnics and universities across South-West Nigeria. A sample of three hundred and twenty (320) technical teachers was randomly selected. Out of this, three hundred and sixteen (316) respondents participated in the study, yielding a response rate of 98.75%. The primary instrument for data collection was a structured questionnaire tagged "Enriching Quality of Technical Teachers Questionnaire" (EQTTQ). The questionnaire was based on a Likert format with responses ranging from "strongly disagree" (1) to "strongly agree" (5). The items on the questionnaire were formulated based on relevant literature and expert consultation to ensure content validity. The reliability was measured using Cronbach alpha reliability method which yielded a reliability coefficient of 0.84. The collected data were analysed using mean and standard deviation as the primary statistical tools. The decision rule for this study was set at mean score of 3.50. Any item with a mean score of 3.50 and above was considered as agree while those with mean score below mean score of 3.50 was considered disagree.

Results

The results for the study were obtained from the research questions answered through data collected and analysed.

Table 1: Mean and Standard deviation of Respondents on how sustainable practices can be effectively integrated into technical teacher education to enhance the quality of TVET in Nigerian higher institutions

S/NO	]TEMS	MEAN	SD	REMARK
1	The integration of sustainability concepts into technical teacher education curricula is crucial for improving the quality of education.	4.06	0.86	Agree
2	Incorporating sustainable practices into teacher training programs enhances the practical teaching skills of technical educators.	4.16	0.89	Agree
3	My institution effectively integrates sustainable practices into the curriculum for technical teacher education.	4.09	0.87	Agree
4	There is a strong emphasis on environmental sustainability in technical teacher education programmes.	4.22	0.58	Agree
5	Industry partnerships play a significant role in integrating sustainable practices into technical teacher education.	4.00	0.89	Agree
6	Training in renewable energy technologies is a key component of sustainability in technical teacher education.	4.00	0.80	Agree
7	Continuous professional development on sustainability is essential for technical teachers to stay current with industry trends.	3.87	0.72	Agree
8	The inclusion of sustainability topics in technical teacher education encourages innovation and creativity among students.	3.83	0.89	Agree
9	Technical teacher education in Nigeria benefits from adopting international best practices in sustainability.	4.06	0.77	Agree
10	Practical projects focused on sustainability are regularly incorporated into technical teacher education.	3.80	0.62	Agree
11	My institution collaborates with external stakeholders to enhance the integration of sustainability in technical teacher education.	3.90	0.97	Agree
12	There are sufficient resources available to effectively integrate sustainability into technical teacher education programmes.	3.51	0.63	Agree
	Grand Mean	3.96	0.79	

Key: SD: Standard Deviation

Data on Table 1 reveal that all the items have their mean value ranging from 3.51 to 4.22, this shows that the mean value of each item was above the cut-off point of 3.50, indicating that the items were agreed by the respondents as sustainable practices which were needed to be integrated into technical teacher education to enhance the quality of TVET in Nigeria.

Table 2: Mean and Standard Deviation of Respondents on the main challenges in implementing sustainable TVET practices within the framework of technical teacher education in Nigeria

S/NO	]TEMS	MEAN	SD	REMARK
1	Insufficient funding is a major challenge in implementing sustainable TVET practices in technical teacher education.	3.81	1.36	Agree
2	The lack of up-to-date infrastructure hinders the adoption of sustainable practices in technical teacher education.	4.05	1.07	Agree
3	There is a significant gap between the sustainability goals of TVET programmes and their practical implementation in technical teacher education.	3.80	1.16	Agree
4	Collaboration with industries is a key opportunity for overcoming challenges in implementing sustainable TVET practices.	4.14	0.95	Agree
5	Resistance to change among educators is a barrier to implementing sustainable practices in technical teacher education.	3.87	1.01	Agree
6	There are clear opportunities for improving technical teacher education through partnerships with sustainability-focused organizations.	3.62	1.44	Agree
7	Government policies effectively support the implementation of sustainable practices in technical teacher education.	3.42	0.81	Disagree
8	The availability of modern teaching materials and resources is a challenge for sustainability in technical teacher education.	4.09	0.96	Agree
9	My institution actively seeks opportunities to enhance sustainability in technical teacher education through external funding and grants.	3.73	0.89	Agree
10	There is strong institutional support for overcoming challenges related to sustainability in technical teacher education.	3.62	1.44	Agree
11	Technical teacher education in Nigeria faces challenges in aligning with global sustainability standards.	3.75	1.24	Agree
12	The increasing demand for green jobs presents an opportunity to implement sustainable TVETteacher education.	3.97	1.13	Agree
	Grand Total	3.82	1.12	

Key: SD: Standard Deviation

Data on Table 2 reveal that all the items except item 7 have their mean value ranging from 3.62-4.14, this shows that the mean value of each item was above the cut-off point of 3.50, indicating that the items were agreed by the respondents as main challenges and opportunities in implementing sustainable TVET practices within the framework of technical teacher education in Nigeria, while item 7 on the table with mean value and standard deviation of 3.42 (.81) implies that government policies does not effectively support the implementation of sustainable practices in technical teacher education.

Discussion of Findings

The study highlighted the impact of sustainable TVET practices on the quality of technical teachers' education in Nigeria. The result of table 1 indicated that technical teacher education in Nigeria should be guided towards benefitting from adopting international best practices in sustainability, training in renewable energy technologies is also a key component. In addition, industry partnerships also play a significant role, and institutional collaborations with external stakeholders to enhance the integration of sustainability in technical teacher education. The standard deviations indicate a higher level of variability in their responses which were in line with the view of Obi (2022), who stated that inculcation of practical teaching skills, curriculum up-date and environmental sustainability were essential to technical teachers' education programmes. In table 2, collaboration with industries is a

great opportunity for overcoming challenges in implementing sustainable TVET practices. Similarly, the non-availability of modern teaching materials and resources is a challenge for sustainability in technical teacher education according to Oladipo, (2021). The lack of up-to-date infrastructure hindered the adoption of sustainable practices in technical teacher education. This claim supported the opinion of Ajiboye, (2021), who believed that technical teacher training curricula has failed to incorporate new trends in technology and sustainability into its programmes. More so, resistance to change among educators is another noticeable barrier to implementing sustainable practices in technical teacher education. Insufficient funding is a major challenge in implementing sustainable practices in technical teacher education.

Recommendations

Based on the findings the following recommendations were made:

1. The government should develop and implement policies that mandate the integration of sustainability in to TVET curricula and teacher education programme
2. These policies should be supported by adequate funding and resources to insure effective implementation
3. Educational institutions should adopt strategies that promote sustainability, such as incorporating sustainability goals in to their mission statement, establishing sustainability committee, and engaging in regular reviews of curricula and teaching practices to ensure conformity with sustainability principles.
4. Straitening of partnership between TVET institutions and industries is essentials for ensuring for education programmes remain relevant.
5. Institutions should actively seek collaborations with industries that are leaders in sustainable practices, creating opportunities for internships, research, and development projects.

Conclusion

The study has highlighted the critical need to reform technical teacher education in Nigeria to align with sustainable TVET practices. By updating curricula, improving facilities, and strengthening industry partnerships, Nigeria can enhance the quality of technical teacher education and better prepare educators to equip students with the skills needed for a sustainable future. The integration of sustainability into technical teacher education is not only essential for meeting the demands of modern industries but also for promoting environmental responsibility and social equity in Nigeria.

REFERENCES

Adedeji, S. O., & Oladejo, M. A. (2019). *Challenges and prospects of technical and vocational education and training (TVET) in Nigeria*. *African Journal of Educational Research and Development*, 9(2), 112-123.

Adebayo, F. A., & Olaniyi, O. A. (2020). *Integrating sustainability into technical education: case for Nigeria*. *Journal of Vocational Education and Training*, 72(1), 102-119. https://doi.org/10.1080/13636820.2019.1653102

Adeola, A. O., & Oluwaseun, O. T. (2022). Green engineering practices and sustainability in Nigerian higher education: The case of the Federal University of Technology, Akure (FUTA). *Journal of Sustainable Development in Africa*, 24(2), 67-82.

Ajiboye, J. O. (2021). Curriculum reform in Nigerian technical education: Challenges and opportunities. *International Journal of Curriculum and Instruction*, 13(1), 15-29.

Ezeani, N. S., & Urama, A. C. (2019). Professional development of technical teachers in Nigeria: Implications for sustainable development. *International*

Journal of Vocational and Technical Education Research, 5(3), 45-58.

Obi, C. E. (2022). *The impact of continuous professional development on the performance of technical teachers in Nigeria*. *Journal of Education and Practice*, 13(3), 91-99. https://doi.org/10.7176/JEP/13-3-10

Ogbuanya, T. C., & Okoro, C. O. (2018). *Sustainable technical and vocational education and training (TVET) in Nigeria: The need for re-engineering*. *International Journal of Educational Administration and Policy Studies*, 10(3), 22-29. https://doi.org/10.5897/IJEAPS2018.0574

Okoye, K. R. E., & Arimonu, M. O. (2016). *Technical and vocational education in Nigeria: Issues, challenges, and a way forward*. *Journal of Education and Practice*, 7(3), 113-118.

Oladipo, B. A. (2021). *Enhancing sustainability in TVET institutions: Strategies and practices*. *Journal of Sustainable Education*, 9(1), 34-47.

Olawale, I., & Ayodele, A. (2018). *Sustainable education and community development: The role of TVET in Nigeria*. *International Journal of Social Sciences and Humanities Review*, 8(2), 123-134.

Oni, O. (2023). *Renewable energy training at Yaba College of Technology: Addressing the skills gap in Nigeria*. *International Journal of Renewable Energy Development*, 12(1), 54-66. https://doi.org/10.14710/ijred.12.1.54-66

Rauner, F. (2020). *The dual system of vocational education and training in Germany*. *International Journal of Research in Vocational Education and Training*, 7(2), 89-110. https://doi.org/10.13152/IJRVET.7.2.2

UNESCO. (2017). *Greening technical and vocational education and training: A practical guide*. UNESCO Publishing. https://unesdoc.unesco.org/ark:/48223/pf0000259727