Influence of Sustainable Practices on the Electronic Technology Education Students' Employability in South East Nigeria

by

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Abstract

The study examined the influence of sustainable practice on the employability of Electronic Technology Education (ETE) students in South East Nigeria. The study adopted Correlational survey design, two research questions and one hypothesis guided the study. The population for the study is 110 which comprised of 20 Lecturers, 20 Technologists, and 70 undergraduate students of four public Universities in South East region that offer ETE asan area of specialization. The instrument for data collection was a structured questionnaire adapted from existing scales in literature. Pearson Product Moment Correlation, Mean, Standard deviation, and linear regression were used to analyze the data collected. The finding of the study revealed that sustainable practices had a significant positive effect on ETE students' employability. The finding also revealed some of the factors that hinder the implementation of sustainable practices such as obsolete curricula, inadequate funding for sustainable technology initiatives, insufficient teacher training on sustainable technologies, and inadequate policy support. The study recommends review of the ETE curriculum to incorporate sustainability topics, including renewable energy systems, electronic waste management, and energy-efficient technologies. This study contributes to existing literature by further advancing the understanding of sustainable practices' role in enhancing employability in the context of ETE education in South East Nigeria, providing valuable insights for policymakers, educators, and industry stakeholders.

Keywords: Sustainable practices, Employability, Electronic, Technology Education

Introduction

Electronic Technology Education (ETE) refers to the educational discipline focused on imparting theoretical knowledge and practical skills related to electronics, electrical systems, telecommunications, and digital technologies. ETE is concerned with the study and application of electronics (Ogbu, 2015). The goal of ETE is to prepare students for careers in fields such as electrical engineering, electronics maintenance, telecommunication systems, and automation by offering comprehensive training that encompasses the principles of electronics, circuit design, electrical systems, and hands-on experience in modern technologies (Federal Republic of Nigeria, 2013). In other words, ETE is considered as a key contributor to the Nigerian government's goals of reducing unemployment, driving industrialization, and fostering technological innovation (Nworgu & Ofoegbu, 2019). The realization of the stated goals of ETE would require the integration of sustainable practices into the ETE programme. Sustainable practices involve integrating skills that are not only economically relevant but also environmentally and socially responsible. This includes training in green technologies, energy efficiency, waste management, and the promotion of sustainable livelihoods (Maclean, Jagannathan, & Panth, 2018). Sustainable practices also emphasize lifelong learning, adaptability, and the development of soft skills such as critical thinking, problem-solving, and teamwork. Thus, embedding these practices into ETE curricula, institutions can ensure that graduates are not only equipped with technical skills but also with the competencies required to contribute to a sustainable economy (Maclean, Jagannathan, & Panth, 2018). Incorporating sustainable practices into ETE

would also be essential for enhancing employability in the long term.

Employability refers to the ability of graduates to secure and maintain meaningful employment in a competitive labor market. This concept encompasses not only the acquisition of job-specific technical skills but also the development of broader competencies that are essential for adapting to changing work environments. These competencies include problem-solving, critical thinking, communication, teamwork, and a commitment to lifelong learning (Yorke, 2006). Employability in ETE is particularly focused on ensuring that students are ready to meet the immediate needs of employers while also possessing the agility to evolve with industry demands. As industries move towards greener and more sustainable operations, the demand for employees who understand and can implement sustainable practices grows, thereby enhancing the employability of students who have been trained in these areas (Cedefop, 2015). Previous empirical studies (e.g., Agrawal, 2019; Pavlova, 2018) highlight that student employability would significantly enhance when ETE programs incorporate sustainable practices. Students with a strong foundation in sustainable practices are not only employable in current markets but are also better positioned to thrive in future job landscapes that prioritize sustainability (UNESCO-UNEVOC, 2017). This implies that the students would be better equipped to adapt to new technologies and practices that contribute to a sustainable economy, making them valuable assets to employers seeking to reduce their environmental impact and improve social outcomes. However, unemployment in Nigeria especially South East zone is alarmingly high, with many graduates lacking the skills demanded by the labor market. Even with the numerous ETE programmes, the region continues to experience a skills mismatch, where graduates are not fully equipped to meet industry needs. Furthermore, Despite the potential economic benefits of sustainable practices, there seems to a paucity of empirical evidence on its implementation and how it can enhance ETE graduates employability in South East Nigeria. Existing literatures have focused mainly on developed countries or other academic disciplines, thus, overlooking the unemployment challenge faced by the region. The gap between traditional ETE approaches and sustainable practices necessitates an investigation into how these sustainable practices would influence ETE students' employability in South East Nigeria. The findings of this study are expected to inform policymakers, educators, and industry stakeholders about the potential benefits of sustainable practices in promoting ETE students' employability and driving socio-economic development in the region.

Research Questions

1. What is the relationship between sustainable practices and ETE students' employability in South East Nigeria?
2. What are the factors that hinders the implementation of sustainable practices in ETE program in South-East Nigeria?

Hypothesis

The hypothesis tested at 0.05 level of significance guided the study.

1. There is no significant positive relationship between Sustainable practices and ETE students' employability in South East Nigeria.

Methodology

The study employed a correlational survey design, this is because the study explored direct relationships between the study variables (Leedy& Ormrod, 2010). The study was conducted in four universities that offers ETE as a programme in South East Nigeria. The universities include: Ebonyi State University, Enugu State Science and Technology, Nnamdi Azikiwe University, and University of Nigeria, Nsukka that offer it as part of Electrical/Electronic area of

specialization. The choice of the area for the study was as a result of the low ETE students that graduate from the region and facing unemployment when compared to other regions. The population for the study is 110 which comprised of 20 Lecturers, 20 Technologist, and 70 ETE students. There was no sample due to the manageable size of the population. A structured questionnaire was used for data collection. The questionnaire was divided into three sections; section A elicited information about demography from the respondents; section B contains Sustainable Practices Questionnaire (SPQ) developed from literature. It is a 11-item instrument rated on a five-point Likert-type scale; section C contains Student Employability Scale (SES) adapted from Rothwell et al., (2008) Self-perceived employability scale which measured students' employability. SES is a five-point Likert-type scale that comprised of 11 items. The instrument was subjected to face-validation by three experts from the Departments of Industrial Technical Education and Educational Psychology both in University of Nigeria, Nsukka. Cronbach's alpha reliability coefficient was used to determine the internal consistency of the instrument. The alpha values of 0.98, and 0.87 were obtained for SPQ and SES respectively. Data collected were analyzed using mean and standard deviation, and Pearson Product Moment Correlation (PPMC) to answer the research questions, while linear regression was used to test the hypothesis. All computations were carried out using the Statistical Package for Social Sciences (SPSS) version 24.

Results

The results were presented in tables in line with the research questions and hypothsis.

Table 1: Bivariate Correlation Analysis of Sustainable Practices and ETE Students' Employability

Variables	M	SD	N	R	R^2	Sig
Sustainable practices	3.45	0.89	86	0.45**	0.30	0.000
Employability	3.11	0.99				

Note: R^2 (r^2 x 100) = Coefficient of determination; M = Mean; SD = Standard Deviation; r = correlation coefficient,
**Correlation is significant at the 0.01 level (2-tailed); N = Number of participants.

Data in Table 1 showed that the correlation coefficient between sustainable practices and ETE students' employability was 0.45. This indicated that there was a moderate positive correlation between sustainable practices and ETE students' employability. The coefficient of determination (R^2) obtained is 0.30. The coefficient of determination of 0.30 means that 30% of sustainable practices accounted for ETE students' employability.

Table 2: Mean responses on the factors hindering the implementation of sustainable practices in ETE programme in South East Nigeria

S/N	Factors hindering the implementation of sustainable practices in ETE programme	Mean	Std Dev.	Remark
1	Inadequate funding for sustainable technology initiative	2.56	0.31	Agreed
2	Obsolete curriculum	3.03	0.21	Agreed
3	Inadequate infrastructure for sustainable technology training	3.10	0.33	Agreed
4	Insufficient teacher training on sustainable technologies	2.69	0.32	Agreed
5	Limited collaboration with sustainable industries	2.70	0.23	Agreed
6	Inadequate government policy support	31.2	0.25	Agreed
7	Low awareness of importance of sustainability in ETE	2.54	0.78	Agreed
8	Limited availability of learning resources on sustainability	3.00	0.65	Agreed
9	Resistance to change in Educational institution	2.87	0.83	Agreed
10	Poor industry demand for sustainability skills	3.09	0.86	Agreed

Table 2 showed that the factors that hinders the implementation of sustainable practices in ETE in South East Nigeria are: inadequate funding for sustainable technology initiatives; obsolete curriculum; inadequate infrastructure for sustainable technology training; insufficient teacher training on sustainable technologies; limited collaboration with sustainable industries; inadequate government support; low awareness of importance of sustainability in ETE; limited availability of learning resources on sustainability; resistance to change; and poor industry demand for sustainability skills with the mean and standard deviation of 2.56 (0.31), 3.03 (0.21), 3.10 (0.33), 2.69 (0.32), 2.70 (0.23), 3.12 (0.25), 2.54 (0.78), 3.00 (0.65), 2.87 (0.83) and 3.09 (0.86) respectively

Table 3:Linear Regression Analysis of the influence of sustainable practices on ETE Students' Employability

Model	β	SE	F (1,85)	R	R^2	Adj R^2	P	Rem.
Constant		0.26	135. 60	0.55	0.303	0.31	0.000	Sig.
Industry-based training	0.45	0.08						

Dependent Variable: EMPLOYABILITYPredictors: (Constant), SUSTAINABLE PRACTICES

The linear regression model in Table 3 show that sustainable practices accounted for approximate 30% of the variation in ETE students' employability ($\beta = 0.45$, $R^2 = 0.303$, $F(1,85) = 135$, $p<0.001$). This means that sustainable practices had positive impact on ETE students' employability to a certain level. The regression model shows a good model fit and considered significant as the p-value is less than 0.05 ($p = 0.000$). Thus, HO_1 was not accepted.

Discussion of Findings

The study investigated the influence of sustainable practices on ETE students' employability skills. The study found that sustainable practices has positive moderate relationship with ETE students' employability. The test of hypothesis also confirmed that sustainable practices have significant impact on ETE students' employability. The findings suggest that sustainable practices play a crucial role in enhancing the employability of ETE students. The study's finding is in alignment with previous studies that highlighted that knowledge of sustainable green practices in TVET are critical factors in enhancing students' employability (Agrawal, 2019). The authors therefore, infer those sustainable practices in ETE if fully implemented would slightly enhanced ETE students' employability. Similarly, the study also found that inadequate funding for sustainable technology initiatives; obsolete curriculum; inadequate infrastructure for sustainable technology training; insufficient teacher training on sustainable technologies; limited collaboration with sustainable industries; inadequate government policy support; low awareness of importance of sustainability in ETE; limited availability of learning resources on sustainability; resistance to change; and poor industry demand for sustainability skills are some of the factors that hinders the implementation of sustainable practices in ETE in South East Nigeria. The findings of the study are in support of Olumuyiwa& Alabi (2021) that highlighted some of the barriers to sustainability in TVET.

Conclusion

The study x-rayed the influence of sustainable practices on ETE students' employability as well as the factors that hinders the implementation of sustainable practices in ETE in programme in South East Nigeria. Some of barriers include inadequate funding, outdated curricula, insufficient training for educators, a lack of modern infrastructure, and limited collaboration between educational institutions and industries

focusing on sustainability. The study therefore underscores the urgent need for reform in the ETE sector to align with global trends in sustainability, as the failure to integrate these practices not only affects the employability of graduates but also impedes national progress towards sustainable development. Ultimately, integrating sustainable practices into ETE programs will not only improve the employability of its graduates but also enhance the region and by extension the country's economic resilience, environmental stewardship, and capacity for innovation.

Recommendations

Based on the findings from the study, the following were recommended:

2. The Nigerian government, through the National Universities Commission (NUC) and National Board for Technical Education (NBTE), should urgently review the ETE curriculum to incorporate sustainability topics, including renewable energy systems, electronic waste management, and energy-efficient technologies. This will ensure that students are equipped with the skills needed for the green economy.
3. The government and educational institutions should allocate more funding for the development of infrastructure and procurement of modern equipment necessary for teaching sustainable technologies. This includes the creation of green technology laboratories and practical workshops.
4. Regular and comprehensive professional development programs should be designed to train ETE instructors on emerging sustainable technologies. Partnerships with international organizations and institutions that have advanced in sustainability education should be fostered to achieve this goal.
5. here is a need for advocacy on sustainability within the TVET system. Policymakers should be encouraged to enact clear policies that mandate the integration of sustainability into ETE programs. Incentives should be provided for institutions that adopt sustainable practices in their training and operations.

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