

Innovations

Technical Vocational Education and Training [TVET]: A Veritable Tool for Achieving 2030 Sustainable Development Goals [SDGs] in Enugu State, Nigeria

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Abstract: *The 2030 Agenda for Sustainable Development emphasizes the importance of technology as a pillar for the implementation of the Sustainable Development Goals (SDGs). This study focused on technical vocational education and training as a veritable tool for achieving 2030 sustainable development goal in Enugu State, Nigeria. The study was a survey research design conducted at two public universities in Enugu State that runs Technical Vocational Education and Training (TVET). The population for the study was 35 respondents made up of 10 female and 25 male lecturers of Technical Vocational Education and Training. Three research questions and three null hypotheses guided the study. The population for the study was manageable. There was no sampling. All the thirty-five respondents were used for the study. Data generated were analyzed using mean and standard deviation for the research questions and t-test statistical tools were used to test the null hypotheses at 0.05 significant level. The instrument for data collection was twenty structured items questionnaire constructed by the researchers. Three experts from Industrial Technical Education, University of Nigeria, Nsukka validated the instruments. A pilot study of 20 lecturers was conducted at Nnamdi Azikiwe University, Awka in Anambra State. A Cranach Alpha reliability indices of the instrument yielded 0.85 using SPSS version 22. This showed that the instrument was reliable and appropriate for administration. All the 35 questionnaire administered to the respondents were returned. This represents a return rate of 100%. The study among other things found that establishing and adequate funding of technical vocational education and training institutions with modern 21st century teaching and learning equipment are the roles of the government for the achievement of sustainable development goal in Enugu State, Nigeria. Based on the findings, it was*

recommended that the government should establish more technical vocational education and training institutions and give them adequate funding.

Keywords: *Technical vocational education and training, sustainable development goals, veritable tool.*

Introduction

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity. The 17 SDGs are integrated and they recognize that action in one area will affect outcomes in others, and that development must balance social, economic and environmental sustainability. The 17 SDGs which are intergraded as: no poverty, zero hunger; good health and well-being; quality education; gender equality; clean water and sanitation; affordable and clean energy; decent work and economic growth; industry, innovation and infrastructure; reduced inequalities; sustainable cities and communities; responsible consumption and production; climate change; life below water; life on land; peace, justice and strong institutions and partnership for the goals (UNDP, 2023).

The 2030 Agenda for Sustainable Development adopted by all United Nations member states, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. The SDGs recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality and spur economic growth – all while tackling climate change and working to preserve our oceans and forests (UNESCO, 2020).

According to Sumner (2012), sustainable development is a concept that appeared for the first time in 1987 with the publication of the Brundtland report, warning of the negative environmental consequences of economic growth and globalization, which tried to find possible solutions to the problems caused by industrialization and population growth. Many of the challenges facing humankind, such as climate change, water scarcity, inequality and hunger, can only be resolved at a global level and by promoting sustainable development: a commitment to social progress, environmental balance and economic growth. United Nations approved the 2030 Agenda, which contains the Sustainable Development Goals, a call to action to protect the planet and guarantee the global well-being of people. These common goals require the active involvement of individuals, businesses, administrations and countries around the world (Touboulic & Walker, 2015).

The Sustainable Development Goals are a call from the United Nations to all countries around the world to address the great challenges that humanity faces

and to ensure that all people have the same opportunities to live a better life without compromising our planet. Human-kind faces many challenges to ensure that all people have the same development and well-being opportunities. One of the major recent achievements in sustainability has been the adoption of Agenda 2030 and the Sustainable Development Goals (Klopp & Petretta ,2017).

The Sustainable Development Goals (SDGs) are universal goals applicable, not only to developing countries but also developed countries. The SDGs pledge to “Leave no one behind.” through the implementation process. Japan makes utmost efforts to implement the 2030 Agenda with international community based on the concept of human security and technical vocational education and training (TVET) has crucial role to play in order to make 2030 SDGs a reality. Sustainable development is the meeting of the needs of the present without compromising the ability of future generation to meet their own needs. It is a development that organizes the principle for meeting human development goals while simultaneously sustaining the ability of natural systems to provide the natural resources and ecosystem services on which the economy and society depend (Nicolas,2018).It depends fundamentally on upholding human rights and ensuring peace and security. Technical vocational education and training (TVET) is the bed rock and “silver bullet” for any sustainable development. There cannot be any sustainable development without involving technical vocational education and training (TVET) in one way or the other.

Technical vocational education and training (TVET) is an academic programme designed to provide students with relevant knowledge, skills and attitude that will enable them work in the places where applied science is required. It is a form of educational process involving, in addition to general knowledge, the study of technologies and related science and the acquisition of practical skills and attitude to function effectively in the industry and society (UNESCO 2015).Technical vocational education and training (TVET) is a special type of education given to an individual to develop their creative and manipulative potentials for the benefit of humanity (Alvan, 2018). It is an education connected with the practical use skills, machinery and methods among others in science and industry. (Lilian, 2013).It is an aspect of education that exposes the learner to the acquisition of demonstrable skills that could be transformed into economic benefits (UNESCO, 2020). It is the technical and vocational academic and professional preparation of students for job involving applied science and modern skills. It involves the understanding and applications of basic principles of science and mathematics. Technical vocational education and training (TVET) facilitates the acquisition of practical and applied skills as well as basic scientific knowledge. It is a learning experience that begins with exploration of career options and life skills (Okaro, Ofoegbu, & Okafor 2018).It is an education that provides special practical knowledge of technologies and

skills. It makes students skilled and technically fit for the industries (Devendra 2018).

Statement of the Problem

The world is moving towards the 2030 agenda for sustainable development. Nine out of ten city dwellers are living in air pollution cities. Seven hundred and sixty seven million people live on less than 1.90 US dollars a day. There is need for food security for 793 million people who are confronted with hunger. There is need to reduce the rate of maternal deaths, progress towards sustainable energy and infrastructures and to make quality education to be within reach of all. With all these challenges facing humanity, it then becomes crucial to look into technical vocational education and training (TVET) as a veritable tool for achieving 2030 sustainable development goals achievement in Enugu State. Hence, the problem of this study is to find out how technical and vocational education and training could be a veritable tool for achieving 2030 sustainable development goals in Enugu State.

Purpose of the Study

The purpose of this study is to determine how technical vocational education and training could be a veritable tool for achieving 2030 sustainable development goals in Enugu State. Specifically the study seeks to determine the role of:

1. Government in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria.
2. Lecturers in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria.
3. Students in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria.

Research Questions

The following research questions were posed to guide the study.

1. What are the roles of governments in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria?
2. What are the roles of lecturers in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria?
3. What are the roles of students in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria?

Null Hypotheses

The following null hypotheses were tested at 0.05 level of significance.

Ho1: There is no significant difference between the mean responses of female

and male lecturers on the roles of government in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria.

Ho2: A significant difference does not exist between the mean responses of female and male lecturers on the roles of lecturers in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria.

Ho3: There is no significant difference between the mean responses of female

and male lecturers on the roles of students in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria.

Methodology

The design adopted in this study is survey research design. The area of the study was Enugu State of Nigeria. The study was conducted at the two public Universities in Enugu State that runs Technical Vocational Education and Training. The population for the study was 35 lecturers. The population comprised of 10 female and 25 male lecturers of University of Nigeria, Nsukka and Enugu State University of science and technology, Enugu. The population for the study was manageable. There was no sampling. The instrument for data collection was twenty structured items questionnaire constructed by the researchers using a four point responses scale of strongly agree (4), agree (3), disagree (2) and strongly disagree (1). The instrument was face validated by three experts, from University of Nigeria, Their corrections and suggestions were used to produce the final instrument. To determine the reliability of the instrument, a pilot study of 20 students was conducted at Nnamdi Azikwai University, Awka in Anambra State. A Cronbach Alpha reliability indices of the instrument yielded 0.85 using SPSS version 22. This showed that the instrument was reliable and appropriate for administration. The instrument was administered by hand with the aid of two research assistants. All the 35 questionnaire administered to the respondents were returned. This represents a return rate of 100%. Mean and standard deviation was used to answer the research questions while t-test statistical tool was used to test the null hypotheses at 0.05 level of significance. To take decision on the agreed items, true limit of numbers was assigned to response options as follows: Strongly Agree (SA) 4.00 -3.50, Agree (A): 3.49-2.50, Disagree (D): 2.49-

1.50 and Strongly Disagree (SA) 1.49 -1.00. Therefore any item with mean value of 2.50 and above was agreed and disagreed if below 2.50.

The t-test was used to test the hypotheses at 0.05 level of significance. The t-test was considered suitable because according to Uzoagulu (2011) the t-test is more appropriate when the sample size (n) is small. The t-critical (t-table) value for accepting or rejecting the null hypotheses was ± 1.96 at 33 degree of freedom (df).

Results

Data for the study were presented and analyzed based on the research questions and hypotheses that guided the study. The details are contained in the tables 1-6.

Research Question One:

What are the roles of governments in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria?

Table 1: Mean and Standard Deviation of the Respondents on the Roles of Government in making Technical Vocational Education and Training (TVET) a Veritable tool for achieving 2030 Sustainable Development Goals in Enugu State, Nigeria.

	Item statement	Females		Males		Overall		Dec.
		X1	SD	X2	SD	X3	SD	
			1		2		3	
1	Employment of qualified TVET staff	3.20	0.72	3.01	0.45	3.11	0.59	Agree
2	Provision of 21 st century TVET workshop & laboratories	3.60	0.77	3.00	0.47	3.30	0.62	Agree
3	Establishing more TVET institutions	3.70	0.62	3.60	0.78	3.65	0.70	Agree
4	Good funding of TVET	3.00	0.45	3.59	0.66	3.29	0.56	Agree
5	Improve salaries and allowances of TVET staff	3.10	0.50	3.00	0.47	3.05	0.49	Agree
6	Constant training and re-training of TVET staff	3.20	0.72	3.01	0.46	3.11	0.59	Agree
7	Scholarship to gifted TVET students	3.70	0.62	3.60	0.78	3.65	0.70	Agree
	Cluster mean	3.36	0.63	3.27	0.58	3.32	0.61	Agree

Note: X_1 = Mean of female lecturers, X_2 = Mean of male lecturers, SD_1 = Standard deviation of female lecturers, SD_2 = Standard deviation of male lecturers, X_3 = Average mean, SD_3 = Average standard deviation, Dec. = Decision.

The data in Table 1 shows the mean ratings and standard deviation of responses on the roles of government in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria. The data shows that the respondents strongly agreed to great extent that all the items identified are the roles of government in making technical vocational education and training (TVET) a veritable tool achieving 2030 sustainable development goals. The mean values that range from 3.00 to 3.70 for the two groups of the respondents were above the bench mark of 2.50 and the cluster means of 3.36 and 3.27 respectively for female and male lecturers were also above the benchmark of 2.50. The closeness of the standard deviation scores of the respondents indicates less variability that exists among the respondents.

Research Question Two:

What are the roles of lecturers in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria?

Table 2: Mean and Standard Deviation of the Respondents on the Roles of Lecturers in making Technical Vocational Education and Training (TVET) a Veritable tool for achieving 2030 Sustainable Development Goals in Enugu State, Nigeria.

	Item statement	Females		Males		Overall		Dec.
		X1	SD1	X2	SD2	X3	SD3	
8	Help students to understand SDGs	3.10	0.49	3.00	0.45	3.05	0.47	Agree
9	Research and meaningful contribution of knowledge towards SDGs	3.77	0.43	3.20	0.61	3.49	0.52	Agree
10	Incorporating SDGs into the curriculum	3.10	0.88	3.00	0.47	3.05	0.68	Agree
11	Helping students to advance the SDGs from any discipline	3.69	0.62	3.50	0.71	3.60	0.67	Agree
12	Raising public awareness of the SDGs cause	3.77	0.45	3.20	0.62	3.49	0.54	Agree
13	Provide academic training geared towards SDGs solution	3.77	0.45	3.51	0.71	3.64	0.57	Agree
14	Provide professional training geared towards SDGs solution	3.76	0.46	3.50	0.71	3.63	0.58	Agree
	Cluster mean	3.56	0.54	3.27	0.61	3.42	0.58	Agree

Note: X 1= Mean of female lecturers, X2 = Mean of male lecturers, SD1 = Standard deviation of female lecturers, SD2= Standard deviation of male lecturers, X3=overall mean, SD3 = Average standard deviation, Dec. = Decision.

The data in Table 2 shows the mean ratings and standard deviation of responses on the roles of lecturers in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria. The data showed that the respondents strongly agreed that all the items identified are the roles of lecturers in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria. The mean values that range from 3.10 to 3.77 for the two groups of the respondents were above the bench mark of 2.50 and the cluster means of 3.56 and 3.27 respectively for female and male lecturers were also above the benchmark of 2.50. The closeness of the standard deviation scores of the respondents indicates less variability that exists among the respondents.

Research Question Three:

What are the roles of students in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State?

Table 3: Mean and Standard Deviation of the Respondents on the Roles of Students in making Technical Vocational Education and Training (TVET) a Veritable tool for achieving 2030 Sustainable Development Goals in Enugu State, Nigeria.

	Item statement	Females		Males		Overall		Dec.
		X1	SD1	X2	SD2	X3	SD3	
15	Student activism on SDGs	3.10	0.49	3.00	0.45	3.05	0.47	Agree
16	Sense of social responsibility towards community development	3.77	0.43	3.20	0.61	3.49	0.52	Agree
17	Collaborating and teaming with government	3.10	0.88	3.00	0.47	3.05	0.68	Agree
18	Sustainable innovation	3.69	0.62	3.50	0.71	3.60	0.67	Agree
19	Speaking up for positive change	3.77	0.45	3.20	0.62	3.49	0.54	Agree
20	Acting for positive change	3.77	0.45	3.51	0.70	3.64	0.57	Agree
	Cluster mean	3.56	0.54	3.27	0.61	3.42	0.58	Agree

Note: X 1= mean of female lecturers, X2 = mean of male lecturers, SD1 = Standard deviation of female lecturers, SD2= Standard deviation of male lecturers, X3=Average mean, SD3 = Average standard deviation, Dec. = Decision.

The data in Table 3 shows the mean ratings and standard deviation of responses on the roles of students in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria. The data showed that the respondents strongly agreed that all the items indentified are the roles of students in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria. The mean values that range from 3.10 to 3.77 for the two groups of the respondents were above the bench mark of 2.50 and the cluster means of 3.56 and 3.27 respectively for female and male lecturers

were also above the benchmark of 2.50. The closeness of the standard deviation scores of the respondents indicates less variability that exists among the respondents.

Null Hypotheses Testing

Null Hypothesis One:

There is no significant difference between the mean responses of female and male lecturers on the roles of government in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria.

Table 4: t-test Analysis of the Mean Responses of Female and Male Lecturers on the Roles of Government in making Technical Vocational Education and Training (TVET) a Veritable tool for achieving 2030 Sustainable Development Goals in Enugu State, Nigeria.

Respondents	N	X	SD	Df	t-cal	t-crit	Decision
Females	10	3.36	0.63	33	0.22	±1.96	NS
Males	25	3.27	0.58				

Note: N = Number of respondents, X = Mean, SD = Standard deviation, t-cal = t-test calculated,

t-crit = t-critical value and NS = Not significant

The data in Table 4 presents t-test analysis of the mean responses of female and male lecturers on the roles of government in making technical vocational education and training (TVET) a veritable tool in achieving sustainable development goals in Enugu State, Nigeria. The data indicated that at 0.05 level of significant, t-calculated of 0.22 is less than t-critical which is ±1.96. This implies that there is no significant difference in the mean responses of female and male lecturers on the roles of government in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria.

Null Hypothesis Two:

A significant difference does not exist between the mean responses of female and male lecturers on the roles of lecturers in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria.

Table 5: t-test Analysis of the Mean Responses of Female and Male Lecturers on the Roles of Lecturers in making Technical Vocational Education and Training (TVET) a veritable tool for achieving 2030 Sustainable Development Goals in Enugu State, Nigeria.

Respondents	N	X	SD	Df	t-cal	t-crit	Decision
Female	10	3.56	0.54	33	0.53	±1.96	NS
Male	25	3.27	0.61				

Note: N = Number of respondents, X = Mean, SD = Standard deviation, t-cal = t-test calculated, t-crit = t-critical value and NS = Not significant

The data in Table 5 presents t-test analysis of the mean responses of female and male lecturers on the roles of lecturers in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals. The data indicated that at 0.05 level of significant t-calculated of 0.53 is less than t-critical which is ±1.96. This implies that there is no significant difference in the mean responses of female and male lecturers on roles of lecturers in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State.

Null Hypothesis Three:

A significant difference does not exist between the mean responses of female and male lecturers on the roles of the students in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria.

Table 6: t-test Analysis of the Mean Responses of Female and Male Lecturer on the Roles of Students in making Technical Vocational Education and Training (TVET) a Veritable tool for achieving 2030 Sustainable Development Goals in Enugu State, Nigeria.

Respondents	N	X	SD	Df	t-cal	t-crit	Decision
Female	10	3.56	0.54	33	0.52	±1.96	NS
Male	25	3.27	0.61				

Note: N = Number of respondents, X = Mean, SD = standard deviation, t-cal = t-test calculated, t-crit = t-critical value and NS = Not significant

The data in Table 6 presents t-test analysis of the mean responses of female and male lecturers on the roles of students in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria. The data indicated that at 0.05 level of significant, t-calculated of 0.52 is less than t-critical which is ± 1.96 . This implies that there is no significant difference in the mean responses of female and male lecturers on roles of students in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria.

Discussion of Findings

The findings revealed that the employment good and qualified technical vocational education and training (TVET) staff, provision of 21st century technical vocational education and training (TVET) workshops and laboratories, establishing more technical vocational education and training (TVET) institution, increase technical vocational education and training (TVET) funding, improve salaries and allowances of technical vocational education and training (TVET) staff, constant training and re-training technical vocational education and training (TVET) staff, scholarship and grant to gifted technical vocational education and training (TVET) students are the roles of the government in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria. The respondents strongly agreed to all the indentified items. This was observed from the overall mean values which were above the bench mark. These findings were in agreement with the statement made by Hoyt (2010) that the government has roles which they should play in making sustainable development goals a reality. The finding also revealed that technical vocational education and training (TVET) lecturers should help students to understand SDGs, do meaningful researches on SDGs, incorporate SDGs in the curriculum, raise public awareness on SDGs and provide academic and professional training gears towards SDGs in other in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria. The respondents agreed to all the indentified items to great extent. This was observed from the overall mean (\bar{x}) values which indicated agreed because the mean values were above the bench mark. This was in agreement with earlier studies of Brain (2019) and Bail (2020) that lecturers should aid their students in making them relevant for the achievement of sustainable development.

The finding showed that students' activism on SDGs, collaboration with government, sustainable invention, speaking and acting for positive change are the roles the students should play in making the achievement of 2030 sustainable development goals a reality in Enugu State, Nigeria. These findings were in agreement with the statement of Alan (2018) that both students and lecturers have roles to play in other to make 2030 sustainable development goals a success.

The closeness of the responses as shown by the entire standard deviation (SD) indicates homogeneity in their responses. Testing of the three hypotheses revealed that there were no significance difference between the mean responses of female and male lecturers on the roles of the government, technical vocational education and training (TVET) lecturers and students in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria.

Conclusion

The study set out to ascertain how technical vocational education and training could be a veritable tool for achieving 2030 Sustainable Development Goals (SDGs) in Enugu State, Nigeria. In conclusion, the respondents unanimously agreed that the government, technical vocational education and training (TVET) lecturers and students have roles to play to make sustainable development goals (SDGs) a reality in Enugu State, Nigeria. The study also revealed that there were no significance difference between the mean responses of female and male lecturers on the roles of the government, technical vocational education and training (TVET) lecturer and students in making technical vocational education and training (TVET) a veritable tool for achieving 2030 sustainable development goals in Enugu State, Nigeria.

Recommendations

Based on the findings of the study the following recommendations were made:

1. The government should allocate good funding to technical vocational education and training (TVET).
2. There should be an improved salary and allowances to technical vocational education and training (TVET) staff.
3. There should be a constant training and re-training of technical vocational education and training (TVET) staff.

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