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TVET Educators' Acquisition of Green Skills in Achieving SDG 2030 in Nigerian Universities: Challenges and Way forward

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Abstract
The paper examined Technical Vocational Education and Training (TVET) educators' acquisition of green skills in achieving sustainable development goal 2030 in Nigerian Universities. Three research questions and three null hypotheses were formulated to guide the study. Purposive sampling technique was used to select 150 TVET educators from a population of 264 TVET educators in five Universities in South-East geopolitical zone in Nigeria. A 22-item questionnaire of 4-point rating scale was used for data collection. The instrument was content and faced validated by three research experts, while the reliability of the instrument was obtained using Cronbach Alpha statistics which yielded a reliability coefficient of 0.86. Mean and standard deviation were used to answer research questions while the hypotheses were tested using independence t-test at 0.05 level of significance. The findings of the study revealed that TVET educators lack skills in design, leadership, management, city planning, landscaping, energy, finance, procurement, waste management and communication needed in green economy. The study revealed the challenges facing TVET educators' acquisition of green skills as lack of skills in design, leadership, management, city planning, landscaping, energy, finance, procurement, waste management and communication needed in green economy. From the findings of the study, it was recommended that Federal, State and Universities management should provide resources and train TVET educators on green skills in Nigerian Universities towards achieving sustainable development goal 2030.

Keywords: Nigeria, Universities, SDG 2030, TVET Educators, Green Skills,

Introduction

University education in Nigeria provides post-secondary education that develops the manpower in different areas of specialization for self-reliance, employment and sustainable development. According to International Institute for Sustainable Development (IISD, 2015), Kamisa, Alwia, Limuna, Zakariab and Yunus (2017), Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Jonathan and Micah (2017), defines sustainable development as targets-oriented, long-term, comprehensive and synergetic process with impacts on all aspects of life at all levels. According to UNESCO (2014), education for sustainable development encourages changes in

knowledge, skills, values and attitudes to enable a more sustainable and equitable society. Education for Sustainability is the approach that not only provides theoretical information about sustainability but also gives practical tools, to move the society towards sustainability.

The 2030 agenda for sustainable development, adopted by the 193 Member States of the United Nations in September 2015, outlines goal 13 as a transformative goal to help developing countries move toward a low-carbon economy and improve education, awareness, human and institutional capacity on climate change mitigation, adaptation and impact reduction for the next 15 years (UNESCO, 2015; Asukwo, Moses, Ibanga and Yusuf (2020). In the view of UNESCO (2015), climate change is now affecting every country disrupting national economies, affecting lives and cost of living. According to Jonathan and Micah (2017), for the goals of sustainable development to be achieved, there must be an educational programme whose goals are directed toward the achievement of economic growth of the citizens, skill acquisition and empowerments. The European Centre for the Development of Vocational Training (CEDEFOP, 2014), Lai, Zaime and Foong (2018), Zubir, Ismail, Azizi, Ahmad, Lai, Zaime, and Ibrahim (2020), stressed that in the framework of sustainable economic development and low-carbon economy, development of green skills is needed. In the view of Lotz-Sisitka and Ramsarup (2019), inadequate response to green skills training in educational institutions has far-reaching consequences for industries and the economy as a whole. Setiawan (2017), posited that significant skills gaps are created in low-carbon economy due to the needs of the green industry. Lai, Zaime and Foong (2018), stated that the elements of green skills required among industries include design, leadership, management, city planning, landscaping, energy, financial, procurement, waste management and communication.

Jahonga, Ngore and Muramba (2015), maintained that efforts should now turn the tides towards transferring the green technology skill to students who can implement this technology in their present and future employment. In the views of Ramlia, Rasulb and Affandic (2019), Krishnan and Nandhini, (2020), the need to integrate green skills in Technical and Vocational Education and Training (TVET) institutions and to promote awareness of protecting the environment among all educators, should be considered most. According to Setiawan (2017), TVET institutions have an essential role to play in producing green skills workers since TVET is closely and directly connected with the development of economy and society. The national policy on Education (FRN, 2013), viewed TVET as a comprehensive term referring to those aspects of educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. The goal of TVET according to FRN (2013), is to give training and impart the necessary skills to individual for employment and self-reliance. Kehinde and Adewuyi (2015), Okon (2019), Ramadan and Chen (2018), maintained that TVET is a means through which skills needs of learners from different socio-economic backgrounds are responded to, thus preparing them for self-employment and sustainable livelihood.

In most developing countries, governments and universities have failed to address the green skills challenges that affect environmental issues and climate change. Zubir, Ismail, Azizi, Ahmad, Lai, Zaime, and Ibrahim (2020), noted that most of the teaching staff in TVET institutions do not understand the elements of green skills and are unable to perform their duties in an environmentally friendly manner. According to Tilak and Choudhury (2021), most graduates lack skills in problem-solving, consulting, networking, ICT, recognition of the social and market needs, gathering the essential material resources, convincing others of the value of an opportunity and developing an idea as a commercial opportunity. Okwelle and Owo (2017), Brown (2018), Opoko, Badmus, Abiola, Odizia, Oluwole, Pamilerin, Rotimi, Chima, Mabadeje and Otusemade (2018) Ubogu (2020) and Gbadamosi (2021), stressed that tertiary institutions in Nigeria lack adequate instructional materials and resources, competent teachers, classrooms and practical materials. Osisioma (2015), Owo (2017), Brown (2018) and Ubogu (2020), stated that there is urgent need for the employment of qualified and experience teachers, provision of instructional resources, practical materials and equipment in tertiary institutions in Nigeria. Hence, the need to examine Technical Vocational Education and Training (TVET) educators' acquisition of green skills in achieving sustainable development goal 2030 in Nigerian Universities.

Statement of the Problem

Recently, serious attention is paid to TVET skill acquisition in Nigerian Universities to compete in the workplace of today. The reason for this is that Nigeria Universities turns out thousands of TVET graduates from about 170 universities every year without exposing them to green skills for sustainable development. This menace could be traced to lack of skills in design, leadership, management, city planning, landscaping, energy, finance, procurement, waste management and communication needed in green economy. TVET educators lack skills on the essential training material resources and opportunities in green economy due to lack of integration of green skills in TVET curriculum, lack of classrooms, instructional resources, practical materials, equipment and inexperience TVET educators on green skills. It is in recognition of this challenges that this study seeks to examined Technical Vocational Education and Training (TVET) educators' acquisition of green skills in achieving sustainable development goal 2030 in Nigerian Universities.

Purpose of the Study

The main purpose of the study was to examine Technical Vocational Education and Training (TVET) educators' acquisition of green skills in achieving sustainable development goal 2030 in Nigerian Universities. Specifically, the study determines:

1. TVET educators' green skills in Universities in South-East geopolitical zone, Nigeria.
2. The challenges facing TVET educators' acquisition of green skills in Universities in South-East geopolitical zone, Nigeria.

3. The strategies to eliminate the challenges facing TVET educators' acquisition of green skills in Universities in South-East geopolitical zone, Nigeria?

Research Questions

1. Does TVET educators acquire green skills in Universities in South-East geopolitical zone, Nigeria?
2. What are the challenges facing TVET educator's acquisition of green skills in Universities in South-East geopolitical zone, Nigeria?
3. What are the strategies to eliminate the challenges facing TVET educator's acquisition of green skills in Universities in South-East geopolitical zone, Nigeria?

Null Hypotheses

Three hypotheses were formulated to guide the study:

HO_1 - There is no significant difference between the mean response of male and female respondents on TVET educators' acquisition of green skills in Nigerian Universities.

HO_2 - There is no significant difference between the mean response of male and female respondents on the challenges facing TVET educators' acquisition of green skills in Nigerian Universities.

HO_3 - There is no significant difference between the mean response of male and female respondents on the strategies to eliminate the challenges facing TVET educators' acquisition of green skills in Nigerian Universities.

Methodology

The study was carried out in Federal and State Universities in South-East Nigeria. The study employed descriptive survey research design. Nworgu (2006), noted that it is a design approach which aims at collecting data and describing them in a systematic manner, the characteristics, features or facts about a given population. Purposive sampling technique was used to select 150 TVET educator from a population of 264 TVET educator in five Universities in South-East geopolitical zone in Nigeria. The instrument used for data collection was a structured questionnaire titled "TVET educators' acquisition of Green Skills in Nigerian Universities Questionnaire (TEAGSNUQ). The questionnaire has Part A, B and C with twenty-eight (28) items respectively for mean rating of respondents on TVET educator's green skills acquisition, challenges and strategies to eliminate the challenges.

A four-point rating scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) was provided for the respondents to make their responses in research question. The cut-off points for the interpretation of the mean of the respondents' opinion were: 3.50-4.00, 2.50 - 3.49, 1.50 - 2.49 and 1.00-1.49 respectively. The face validation of the instrument was ascertained by three experts in Industrial Technology Education Department and Measurement and Evaluation Department, University of Uyo, Akwa Iborn State. In order to

ensure the reliability of the instrument, Cronbach Alpha statistics was used to analyze the data collected which yielded a reliability coefficient of 0.86 which shows the instrument was reliable for the study.

The researchers administered the instrument directly to the respondents in the Universities with the help of three research assistants who were instructed on what was required. The instrument was collected immediately after completion which recorded 100% return rate. The research data collected were answered using mean and standard deviation while independent t-test was used to test the null hypotheses at .05 level of significance. Where the calculated t-value was greater than the tabulated value, null hypothesis was rejected, where the calculated t-value was less than the tabulated value null hypotheses was upheld.

Presentation of Data Analysis and Results

Research Question 1: Does TVET educators acquire green skills in Universities in South-East geopolitical zone, Nigeria?

Table 1: TVET educators' acquisition of green skills in Universities in South-East geopolitical zone, Nigeria.

S/N	TVET Educators Acquisition of Green Skills	MALE		FEMALE		Rmk
		$\bar{X}$	SD	$\bar{X}$	SD	
1.	Design skills	1.42	0.96	1.32	1.09	SD
2.	Leadership skills	1.48	1.18	1.45	0.14	SD
3.	Management skills	1.44	0.84	1.36	1.18	SD
4.	City planning skills	1.40	1.09	1.48	1.24	SD
5.	Landscaping skills	1.49	0.85	1.44	0.32	SD
6.	City planning skills	1.43	1.02	1.49	1.06	SD
7.	Finance skills	1.47	0.83	1.43	1.21	SD
8.	Procurement skills	1.39	0.79	1.29	1.30	SD
9.	Communication skills	1.42	1.22	1.38	1.16	SD
10.	Waste management skills.	1.48	1.51	1.42	0.22	SD
	Grand Mean and Standard Deviation	**1.44**	**1.03**	**1.41**	**0.89**	SD

Note: NA = Not Aware

The data presented in Table 1 shows Grand Mean and Standard Deviation of 1.44, 1.41 and 1.03, 0.89 for male and female respondents on TVET educators' acquisition of green skills in Universities in South-East geopolitical zone, Nigeria. The result indicates that male and female

TVET educators do not acquire green skills in Universities in South-East geopolitical zone, Nigeria.

Research Question 2: What are the challenges facing TVET educator's acquisition of green skills in Universities in South-East geopolitical zone, Nigeria?

Table 2: Challenges facing TVET educators' acquisition of green skills in Universities in South-East geopolitical zone, Nigeria.

S/N	Challenges facing TVET Educators Acquisition of Green Skills	MALE		FEMALE		Rmk.
		$\bar{X}$	SD	$\bar{X}$	SD	
1.	Lack of practical materials and utilization processes	3.52	1.51	3.61	1.92	SA
2.	Lack of resources on design skills	3.58	2.02	3.68	1.69	SA
3.	Lack of resources on leadership skills	3.64	1.14	3.52	0.98	SA
4.	Lack of resources on management skills	3.59	2.01	3.76	2.00	SA
5.	Lack of resources on city planning skills	3.51	1.82	3.62	1.85	SA
6.	Lack of resources on landscaping skills	3.73	1.97	3.56	2.02	SA
7.	Lack of resources on finance skills	3.62	1.77	3.61	1.85	SA
8.	Lack of resources on procurement skills	3.81	1.74	3.69	1.79	SA
9.	Lack of resources on communication skills.	3.92	1.51	3.51	1.96	SA
	Grand Mean and Standard Deviation	**3.66**	**1.75**	**3.61**	**1.40**	**SA**

Note: SA = Strongly Agreed

The data presented in Table 2 shows Grand Mean and Standard Deviation of 3.66, 3.61 and 1.75, 1.40 for male and female respondents respectively on challenges facing TVET educator's acquisition of green skills. The result indicates that male and female respondents strongly agreed that lack of skills in design, leadership, management, city planning, landscaping, finance, procurement, waste management and communication needed in green economy are the challenges facing TVET educators' acquisition of green skills in Universities in South-East geopolitical zone, Nigeria.

Research Question 3: What are the strategies to eliminate the challenges facing TVET educator's acquisition of green skills in Universities in South-East geopolitical zone, Nigeria?

Table 3: Strategies to eliminate the challenges facing TVET educator's acquisition of green skills in Universities in South-East geopolitical zone, Nigeria**.**

S/N	Strategies to Eliminate the Challenges Facing TVET Educators Awareness of Green Skills	Male		Female		Rmk
		$\bar{X}$	SD	$\bar{X}$	SD	
1.	Provision of practical materials and utilization processes for green skills.	3.88	1.33	3.72	0.92	SA
2.	Provision of resources on design skills	3.73	1.26	3.80	1.04	SA
3.	Provision of resources on leadership skills	3.96	0.98	3.84	0.96	SA
4.	Provision of resources on management skills	3.84	1.29	3.77	0.81	SA
5.	Provision of resources on city planning skills	3.80	1.38	3.83	1.19	SA
6.	Provision of resources on landscaping skills	3.89	1.07	3.89	0.99	SA

7.	Provision of resources on finance skills	3.94	0.99	3.82	1.18	SA
8.	Provision of resources on communication and negotiation Provision of resources on procurement skills	3.78	1.36	3.90	0.89	SA
9.	Provision of resources on communication skills	3.69	1.21	3.72	0.96	SA
	Grand mean and standard deviation	**3.84**	**1.20**	**3.81**	**0.99**	**SA**

Note: SA = Strongly Agreed

The data presented in Table 3 shows Grand Mean and Standard Deviation of 3.84, 3.81 and 1.20, 0.99 for male and female respondents respectively on strategies to eliminate the challenges facing TVET educator's acquisition of green skills. The result indicates that the male and female respondents strongly agreed that provision of all the items strategies to eliminate the challenges facing TVET educator's acquisition of green skills in Universities in South-East geopolitical zone, Nigeria.

Null Hypothesis 1: There is no significant difference between the mean response of male and female respondents on TVET educators' acquisition of green skills in Nigerian Universities.

Table 4: Independent t-test analysis on TVET educators' acquisition of green skills in Nigerian Universities.

Variable	n	$\bar{X}$	SD	df	t-cal.	t-crit.	Decision
Male	92	1.44	1.03				
				148	0.19	1.67	NS
Female	58	1.41	0.89				

Note: NS = Not Significant

Table 4 revealed that the t-cal was 0.19 while the t-crit. was 1.67 hence, since the t-cal at 148 degree of freedom is less than t-crit. thus the null hypothesis of no significance difference between means the responses of male and female respondents on TVET educators' acquisition of green skills in Nigerian Universities was upheld. This implies that TVET educators do not acquire green skills in Universities in South-East geopolitical zone, Nigeria.

Null Hypothesis 2: There is no significant difference between the mean response of male and female respondents on the challenges facing TVET educators' acquisition of green skills in Nigerian Universities.

Table 5: Independent t-test analysis on challenges facing TVET educators' acquisition of green skills in Nigerian Universities.

Variable	n	$\bar{X}$	SD	df	t-cal.	t-crit.	Decision
Male	92	3.66	1.75				
				148	0.19	1.67	NS
Female	58	3.61	1.40				

Note: NS = Not Significant

Table 5 shows that the t-cal was 0.19 while the t-crit. was 1.67. hence, since the t-cal was less than the t-crit. at 148 degree of freedom, thus the null hypothesis of no significant difference between the means responses of male and female respondents on the challenges facing TVET educators' acquisition of green skills in Nigerian Universities was upheld. This implies that TVET educators are facing challenges of acquisition of green skills in Universities in South-East geopolitical zone, Nigeria.

Null Hypothesis 3: There is no significant difference between the mean response of male and female respondents on the strategies to eliminate the challenges facing TVET educators' acquisition of green skills in Nigerian Universities.

Table 6: Independent t-test analysis on the strategies to be adopted to eliminate challenges facing female TVET educators on the strategies to eliminate the challenges facing TVET educators' acquisition of green skills in Nigerian Universities.

Variable	N	$\bar{X}$	SD	df	t-cal.	t-crit.	Decision
Male	92	3.84	1.20				
				148	0.17	1.67	NS
Female	58	3.81	0.99				

Note: NS = Not Significant

Table 6 shows that the t-cal was 0.17 while the t-crit. was 1.67 hence, since the t-cal was less than the t-crit. at 148 degree of freedom, thus the null hypothesis of no significant difference between the responses of male and female respondents on the strategies to eliminate the challenges facing TVET educators' acquisition of green skills in Nigerian Universities in South-East geopolitical zone, Nigeria was upheld. This implies that the strategies can eliminate the challenges facing TVET educators' acquisition of green skills in Nigerian Universities.

Discussion of Findings

The findings of research question 1 indicates that male and female TVET educators do not acquire green skills in Universities in South-East geopolitical zone, Nigeria. The findings of this study is in agreement with Zubir, Ismail, Azizi, Ahmad, Lai, Zaime, and Ibrahim (2020), Tilak and Choudhury (2021), who noted that most of the teaching staff in TVET institutions do not understand the elements of green skills and are unable to perform their duties in an environmentally friendly manner.

Hypothesis 1 revealed that there is no significant difference between the mean responses of male and female respondents on TVET educators' acquisition of green skills in Nigerian Universities was upheld. This implies that TVET educators do not acquire green skills in Universities in South-East geopolitical zone, Nigeria.

The data presented in Table 2 shows Grand Mean and Standard Deviation of 3.66, 3.61 and 1.75, 1.40 for male and female respondents respectively on challenges facing TVET educator's acquisition of green skills. The result indicates that male and female respondents

strongly agreed that lack of skills in design, leadership, management, city planning, landscaping, finance, procurement, waste management and communication needed in green economy are the challenges facing TVET educators' acquisition of green skills in Universities in South-East geopolitical zone, Nigeria. This is in line with the study carried out by Okwelle and Owo (2017), Brown (2018), Ubogu (2020) and Gbadamosi (2021), who stressed that tertiary institutions in Nigeria lack adequate instructional materials and resources, competent teachers, classrooms and practical materials.

Hypothesis 2 revealed that there is no significant difference between the mean responses of male and female respondents on the challenges facing TVET educators' acquisition of green skills in Nigerian Universities was upheld. This implies that TVET educators are facing challenges of acquisition of green skills in Universities in South-East geopolitical zone, Nigeria.

The data presented in Table 3 shows Grand Mean and Standard Deviation of 3.84, 3.81 and 1.20, 0.99 for male and female respondents respectively on strategies to eliminate the challenges facing TVET educator's acquisition of green skills. The result indicates that the male and female respondents strongly agreed that provision of all the items strategies to eliminate the challenges facing TVET educator's acquisition of green skills in Universities in South-East geopolitical zone, Nigeria. The findings of this study is in line with the findings of the study carried out by Osisioma (2015), Owo (2017), Brown (2018) and Ubogu (2020) who stated that there is urgent need for the employment of qualified and experience teachers, provision of instructional resources, practical materials and equipment in tertiary institutions in Nigeria.

Hypothesis 3 revealed that there is no significant difference between the mean responses of male and female respondents on the strategies to eliminate the challenges facing TVET educators' awareness of green skills in Universities in South-East geopolitical zone, Nigeria. This implies that the strategies if adopted can eliminate the challenges facing TVET educators' acquisition of green skills in Nigerian Universities.

Conclusion

The NBTE and other stakeholders in Technology Education should help identify the present and future skills needed for transition to a greener resources-efficient and sustainable economy so that the respective boards will develop the right programme activities of instructions for the institutions. Efforts should now turn the tides towards transferring the green technology skill to students who can implement this technology in their present and future employment.

Recommendations

From the findings of the study, the Federal, State and Universities management should endeavor to:

1. Provide classrooms and practical equipment materials and utilization processes required to green economy.
2. In-service training of staff should be continuous exercise to ensure consistent improvement in the quality of TVET educators on green skills acquisition.
3. Provide instructional resources on leadership and management skills to attain green skills objectives.
4. Provide instructional resources on innovation skills and risk analysis skills required in green economy.
5. Provide instructional resources on communication, marketing skills, negotiation and consulting skills to address conflicting interests in complex contexts of green economy.
6. Provision of instructional resources and employment of experienced TVET educators on record keeping, contract and product management.
7. Provision of instructional resources on information about a potential opportunity, domain knowledge and associated green skills

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