

An assessment of TVET Students' Awareness in Green Skills in Colleges of Education-Nigeria

¹Mfon Okon Ekong, PhD

²George Williams Kennedy

³Ekerete Udo Etok

¹Department of Home Economics,

²Technical Education & ³Agricultural Education

Akwa Ibom State College of Education, Afaha Nsit

Abstract

Recently many countries have shifted focus to green economy which specifically aims at achieving a resilient, low-carbon and resource-efficient economy. The paper assessed green skills and Technical Vocational Education and Training (TVET) students' awareness in Colleges of Education in South-South geopolitical zone in Nigeria. Three research questions and three null hypotheses were formulated to guide the study. Simple random sampling technique was used to select 375 TVET students from a population of 612 TVET students in three Colleges of Education in the study area. A 24-item questionnaire of 4-point rating scale was used for data collection. Face validation of the instrument was done by three research experts, while the reliability of the instrument was ascertained using Cronbach Alpha statistics which yielded a reliability coefficient of 0.89. Mean and standard deviation were used to answer research questions while the hypotheses were tested with independence t-test at 0.05 level of significance. The findings of the study revealed that the students are not aware of the different types of green skills in TVET which include problem solving skills related to environmental pollution, interpretative skills on environmental phenomena, research skills, data collection skills, analytical skills, exploitation skills on green technology, management skills on natural resources, design skills, controlling skills on environmental pollution, raw materials management skills, energy saving skills, recycling and reuse skills. The study further reveals the challenges facing student's awareness of green skills in TVET is lack of experienced lecturers and courses that exposed students to green skills, lack of policies and practices, collaboration with green TVET industries and institutional exchange programmes for different green skills. From the findings of the study, it was recommended that experienced lecturers be employed to expose the students to policies and practices that support green skills as well as organization of different institutional exchange programmes for different green skills.

Keywords: Nigeria, College of Education, TVET, Green Skills, Students.

Introduction

Countries around the world have experienced different challenges in managing the negative effect of environmental pollution and climate change. The quest to equip individuals with the skills, knowledge, ability, values, attitude and resource-efficient societies in

institutions of higher learning continue to be an opportunity to explore (Handayani, Kamis, Ali, Wahyudin, Mukhidin, 2021; Hamza, Abdullahi and Gyaryal, 2021). Hence, developed countries have shifted focus to green economy which reduce environmental risks, ecological scarcities and enhance low-carbon and resource-efficient economy (Setiawan, 2017; Hamza, Abdullahi and Gyaryal, 2021). The term green economy refers to a low-carbon, resource-efficient and socially inclusive economy (Ngare, Otieno, Omwami, Ogutu, Opiyo, Gikonyo, Otieno, 2022; Dmuchowski, Dmuchowski, Baczewska-Dąbrowska and Gworek, 2021). In a green economy, infrastructure and assets that allow for lower carbon emissions and pollution, improved energy, resource efficiency, preservation of biodiversity and ecosystem services drives employment and income development.

The transition to a green economy has sparked the emergence of green campuses in educational institutions so as to fulfill the requirements of green-collar employees. According to Ribeiro, Hoeckesfeld, Dal-Magro, Favretto, Barichello, Lenzi, de-Andrade (2021), these green campuses provide a multifunctional approach to environmental sustainability through curriculum that incorporate green skills. The European Centre for the Development of Vocational Training (CEDEFOP, 2014), Ramlia, Rasulb and Affandic, (2019), Zubir, Ismail, Azizi, Ahmad, Lai, Zaima, and Ibrahim (2020), defined green skills as complementary to technical skills needed in a low-carbon economy that enable potential employees to secure a place in the job market. Green skills refer to the abilities, values and attitudes needed by human to support the sustainable and effective utilization of resources in the work place (Cox, Carta, Marangozov and Newton, 2012). In the same context, Arasinah, Ridzwan, Mohd, Faizal, Yunu. and Haryanti (2017), define green skills as the technical skills, knowledge, values and attitudes required by the workforce to develop and support social, economic and environmental sustainability. Thirupathy, Mustapha (2020), Ribeiro, Hoeckesfeld, Dal-Magro, Favretto, Barichello, Lenzi, de-Andrade (2021), maintained that green skills are comprised of cognitive, psychomotor and affective domain needed by students for self-reliance and employment.

According to Vijay (2017), Wang and Teng (2019) and Onwusa (2021), students must be prepared to face emerging interconnected social, economic and environmental challenges associated with green economy education as a catalyst for graduates to the green job market. In the view of Thirupathy and Mustapha (2020), Dmuchowski, Dmuchowsk, Baczewska and Gworek (2021), elements of green skills needs to be applied to students to enhance employability and maintain environmental balance. The need for green skills in extra-curricular activities to promote awareness of protecting the environment among all educators, should be considered most to avert the negative effect of environmental pollution and climate change (Ramlia, Rasulb, and Affandic, 2019). Oviawe, Uwameiye and Uddin (2017), opined that to meet the manpower needs of the workplace, the manpower workforce has to possess the right skills, up-to-date knowledge, the right attitude and ability to do work in line with the demands of the occupation. According to Sern, Baharom, Foong, Muda and Ana (2021), the types of green skills needed in Technical Vocational Education and Training (TVET) are problem solving skills related to environmental pollution, interpretative skills on environmental

phenomena, research skills, data collection skills, analytical skills, exploitation skills on green technology, management skills on natural resources, design skills, controlling skills on environmental pollution, raw materials management skills, energy saving skills, recycling and reuse skills.

In Nigeria, Colleges of Education plays a vital role in training of middle-level manpower that teach in primary and junior secondary schools. Over the years, Colleges of Education has produced professional Technical Vocational Education and Training (TVET) teachers in career skills such as Automotive Technology, Building Construction, Electrical/Electronics, Metal Work Technology, Woodwork Technology, Agricultural Technology, and Home Economics Education thus, alleviating the middle-level manpower problems of the nation (Eze, 2013). UNESCO (2015), defined TVET as comprising education, training and skills development relating to a wide range of occupational fields, production, services and livelihoods.

In the same vein, 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. Haramoto, Najafabadi, Poorsadegh, and Mirdamadi (2013), Ramadan and Chen (2018), Danladi, Adamu, Usman, and Doma, (2020), stressed that TVET is the type of education that prepares an individual for a specific career, or a profession in a particular workplace.

Technical Vocational Education and Training (TVET) teachers are required to exposed students to environmental awareness of green skills such as problem solving skills related to environmental pollution, interpretative skills on environmental phenomena, research skills, data collection skills, analytical skills, exploitation skills on green technology, management skills on natural resources, design skills, controlling skills on environmental pollution, raw materials management skills, energy saving skills, recycling and reuse skills. According to Zubir, Ismail, Azizi, Ahmad, Lai, Zaime, and Ibrahim (2020), most of the TVET educators do not have the knowledge or do not understand more deeply the elements of green skills and therefore, do not include in their teaching and learning. Ayonmike (2013), stated that the barriers to green technology include; lack of human resources and skill, lack of information, high implementation costs, lack of green skills compliance curriculum and unknown alternative process technology. In the same vein TVET institutions are neglected in the area of adequate funding, modern facilities, instructional resources, staff motivation, classrooms and experience personnel to expose the students to green skills which consequently affect the country economic development negatively (Brown, 2018; Danladi, Adamu, Usman, and Doma, (2020). Chinda and Bello (2015), Agu and Ayogu (2015) and Onwusa (2021), opined that non-acquisition of skills aggravate male and female TVET graduates negative behavior in the society which leads to thuggery, arm robbery, militancy, ethnic-political clashes and other vices in Nigeria. According to Ramlia, Rasulb and Affandic, (2019), the greening of TVET

institutions will not only add value to the institutional development process, it will stimulate progress towards learning and evolving green job market. Uwemeiya (2014), and Osisioma (2015) and Brown (2018) stated that there is urgent need for the employment of qualified and experience male and female teachers, provision of instructional resources, practical materials and equipment in tertiary institutions in Nigeria. Therefore, this paper focused on the assessment of TVET students' awareness in Green Skills in Colleges of Education in Nigeria.

Statement of the Problem

There is now a serious attention paid to green campus that incorporate green skills and practices into educational institutions and everyday life in order to reduce carbon emission and promote self-reliance and sustainable development. These institutions provide a multifunctional approach to environmental sustainability through curriculum creation, teaching and research, facilities, student skills acquisition and community involvement. In Nigeria, thousands of TVET students graduates from more than 80 Colleges of Education every year without exposure to the elements of green skills in TVET which includes problem solving skills related to environmental pollution, interpretative skills on environmental phenomena, research skills, data collection skills, analytical skills, exploitation skills on green technology, management skills on natural resources, design skills, controlling skills on environmental pollution, raw materials management skills, energy saving skills, recycling and reuse skills, practices, policies, practical equipment and materials, collaborations with industries, different instructional resources and exchange programmes for different types of green skills as a catalyst for the green job market. The lack of awareness and exposure could be traced to lack of instructional resources, lack of classrooms and practical materials and equipment and lack of experience lecturers to expose the students to green skills. Non-acquisition of skills aggravate TVET graduates negative behavior in the society which leads to thuggery, arm robbery, militancy, ethnic-political clashes and other vices in Nigeria. It is in recognition of the desire to trace the root causes of this menace that the researchers carried out this research to recommend strategies to improve student's awareness and exposure to green skills in Nigerian Colleges of Education in South-South geopolitical zone, Nigeria.

Purpose of the Study

The purpose of the study was to examine:

1. The extent students are aware of green skills in Colleges of Education in South-South, Nigeria.
2. The challenges facing student's awareness of green skills in Colleges of Education in South-South, Nigeria.
3. The strategies to eliminate the challenges facing students' aware of green skills in Colleges of Education in South-South, Nigeria.

Research Questions

Three research questions guided the study:

1. To what extent are students aware of green skills in Colleges of Education in South-South, Nigeria?
2. What are the challenges facing students' awareness of green skills in Colleges of Education in South-South, Nigeria?
3. What are the strategies to eliminate the challenges facing students' awareness of green skills in Colleges of Education in South-South, Nigeria?

Null Hypotheses

Three hypotheses were formulated to guide the study:

H₀₁ - There is no significant difference between the mean response of male and female TVET students on awareness of green skills in Colleges of Education in South-South, Nigeria.

H₀₂ - There is no significant difference between the mean response of male and female TVET students on the challenges facing TVET students' awareness of green skills in Colleges of Education in South-South, Nigeria.

H₀₃ - There is no significant difference between the mean response of male and female TVET students on the strategies to eliminate the challenges facing TVET students' awareness of green skills in Colleges of Education in South-South, Nigeria.

Methodology

The study was carried out in Colleges of Education in South-South geopolitical zone in Nigeria. The population of this study was 612 final year TVET students drawn from Agricultural Education Department, Business Education Department, Home Economics Education and Technical Education Department. Simple random sampling technique was used to select 198 Male and 177 Female TVET students from three College of Education making a total of 375 respondents. The instrument used for data collection was a structured questionnaire titled "Technical Vocational Education and Training Students Green Skills Questionnaire (TVETGSQ). The questionnaire has Part A, B and C with twenty-four (24) items for mean rating of respondents on TVET students' awareness, challenges and strategies towards green skills acquisition.

A four-point rating scale of Highly Aware (HA), Moderately Aware (MA), Lowly Aware (LA) and Not Aware (NA) was used to answer research question 1 while Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) was provided for the respondents to make their responses in research question 2 and 3. 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 Technical Education Department, Ignatius Ajuru University of Education and Measurement and Evaluation Department, University of Uyo, Akwa Ibom 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 0.89 which shows the instrument was reliable for the study.

The researchers administered the instrument directly to the respondents in the Colleges of Education 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: To what extent are students aware of green skills in Colleges of Education in South-South, Nigeria?

Table 1: Students' awareness of green skills in Colleges of Education in South-South, Nigeria.

S/ N	Student's Awareness of Green Skills	MALE		FEMALE		DEC
		\bar{X}	SD	\bar{X}	SD	
1.	I am aware of problem-solving skills related to environmental pollution	1.27	1.03	1.29	0.93	NA
2.	I am aware of interpretative skills on environmental phenomena	1.33	0.88	1.35	1.09	NA
3.	I am aware of research and data collection skills	1.38	1.06	1.31	0.71	NA
4.	I am aware of exploitation skills on green technology	1.36	0.95	1.39	1.07	NA
5.	I am aware of management skills on natural resources	1.41	0.72	1.26	0.84	NA
6.	I am aware of design and controlling skills on environmental pollution	1.37	1.05	1.34	1.02	NA
7.	I am aware of raw materials management skills	1.35	1.08	1.42	0.93	NA
8.	I am aware of energy saving skills	1.42	0.99	1.29	1.06	NA
9.	I am aware of analytical skills	1.30	0.98	1.32	0.90	NA
10.	I am aware of recycling and reuse skills	1.34	1.01	1.36	0.97	NA
Grand mean and standard Deviation		1.44	0.97	1.39	0.94	NA

Note: NA = Not Aware

The data presented in Table 1 shows Grand Mean and Standard Deviation of 1.44, 1.39 and 0.97, 0.94 for male and female TVET students respectively on TVET students' awareness of green skills in Colleges of Education in South-South geopolitical zone, Nigeria. The result

indicates that male and female TVET students’ in Nigerian Colleges of Education are not aware of green skills in Colleges of Education in South-South geopolitical zone, Nigeria.

Research Question 2: What are the challenges facing students’ awareness of green skills in Colleges of Education in South-South, Nigeria?

Table 2: Challenges facing Students awareness of green skills in Colleges of Education in South-South, Nigeria.

S/N	Challenges facing Students awareness of green skills	Male		Female		Rmk
		\bar{X}	SD	\bar{X}	SD	
1.	Lack of curriculum that exposed students to green skills.	3.71	1.08	3.83	1.19	SA
2.	Lack of awareness about policies and practices that support green skills.	3.84	1.13	3.71	1.02	SA
3.	Lack of collaboration with Green TVET industries to expose students to green skills.	3.92	1.09	3.86	1.16	SA
4.	Lack of instructional resources for different teaching methods of green skills.	3.80	1.18	3.78	1.12	SA
5.	Inadequate classrooms and practical equipment and materials for green skills	3.74	1.22	3.69	1.04	SA
6.	Lack of experienced TVET lecturers to expose students to courses on green skills.	3.77	1.17	3.74	1.18	SA
7.	Lack of different institutional exchange programmes for different green skills.	3.93	1.20	3.85	0.98	SA
Grand mean and standard Deviation		3.82	1.15	3.78	1.10	SA

Note: SA = Strongly Agreed

The data presented in Table 2 shows Grand Mean and Standard Deviation of 3.82, 3.78 and 1.15, 1.10 for male and female TVET students respectively on challenges facing TVET students’ awareness of green skills. The result indicates that male and female TVET students in Nigerian Colleges of Education strongly agreed that lack of curriculum, policies and practices, collaboration with Green TVET industries, classrooms, instructional resources for different teaching methods, experienced TVET lecturers and lack of institutional exchange programmes for different green skills are challenges facing TVET students’ awareness of green skills in Colleges of Education in South-South, Nigeria.

Research Question 3: What are the strategies to eliminate the challenges facing students’ awareness of green skills in Colleges of Education in South-South, Nigeria?

Table 3: Strategies to eliminate the Challenges facing students' awareness of green skills in Colleges of Education in South-South, Nigeria.

S/N	Strategies to Students Exposure to green skills in TVET	Male		Female		Rmk
		\bar{X}	SD	\bar{X}	SD	
1.	Improvement of curriculum that exposed students to green skills.	3.82	1.03	3.78	0.97	SA
2.	Exposure to policies and practices that support green skills.	3.66	1.11	3.83	1.19	SA
3.	Collaboration with Green TVET industries to expose students to green skills.	3.92	1.34	3.81	1.21	SA
4.	Availability of adequate instructional resources for different teaching methods of green skills.	3.80	1.09	3.79	1.20	SA
5.	Adequate classrooms and practical equipment and materials for green skills	3.84	1.17	3.74	1.23	SA
6.	employment of experience TVET lecturers to expose students to courses on green skills.	3.82	0.98	3.86	1.07	SA
7.	Organization of different institutional exchange programmes for different green skills.	3.85	1.22	3.89	0.76	SA
Grand mean and standard deviation		3.82	1.13	3.81	1.09	SA

Note: SA = Strongly Agreed

The data presented in Table 3 shows Grand Mean and Standard Deviation of 3.82, 3.81 and 1.13, 1.09 for male and female TVET students respectively on strategies to eliminate the challenges facing TVET students' awareness of green skills. The result indicates that male and female TVET students in Nigerian Colleges of Education strongly agreed that all the items are strategies to eliminate the challenges facing TVET students' awareness of green skills in Colleges of Education in South-South, Nigeria.

Null Hypothesis 1: There is no significant difference between the mean response of male and female TVET lecturers on students' awareness of green skills in Colleges of Education in South-South, Nigeria.

Table 4: Independent t-test analysis on students' awareness of green skills in Colleges of Education in South-South, Nigeria.

Variable	n	\bar{X}	SD	df	t-cal.	t-crit.	Decision
Male	198	1.44	0.97	373	0.50	1.67	NS
Female	177	1.39	0.94				

Note NS = Not Significant

Table 4 showed that the t-cal was 0.50 while the t-crit. was 1.67 hence, since the t-cal at 373 degree of freedom is less than t-crit., the null hypothesis of no significance difference between the means responses of male and female TVET lectures on student's awareness of green skills in Colleges of Education in South-South, Nigeria was upheld. This implies that the students are not awareness of green skills in Colleges of Education in South-South, Nigeria.

Null Hypothesis 2: There is no significant difference between the mean response of male and female TVET lecturers on challenges facing students' awareness of green skills in Colleges of Education in South-South, Nigeria.

Table 5: Independent t-test analysis on challenges facing students' awareness of green skills in Colleges of Education in South-South, Nigeria.

Variable	n	\bar{X}	SD	df	t-cal.	t-crit.	Decision
Male	198	3.82	1.15	373	0.33	1.67	NS
Female	177	3.78	0.10				

Note: NS = Not Significant

Table 5 showed that the t-cal was 0.33 while the t-crit. was 1.67. hence, since the t-cal was less than the t-crit. at 373 degree of freedom, the null hypothesis of no significant difference between the responses of male and female TVET lecturers on the challenges facing students' awareness of green skills in Colleges of Education in South-South, Nigeria was upheld. This implies that students are faced with the challenges of awareness to green skills in Colleges of Education in South-South, Nigeria.

Null Hypothesis 3: There is no significant difference between the mean response of male and female TVET lecturers on the strategies to be adopted to eliminate the challenges facing students' awareness of green skills in Colleges of Education in South-South, Nigeria.

Table 6: Independent t-test analysis on the strategies to be adopted to eliminate challenges facing students' awareness of green skills in Colleges of Education in South-South, Nigeria.

Variable	n	\bar{X}	SD	df	t-cal.	t-crit.	Decision
Male	198	3.82	1.13	373	0.77	1.67	NS
Female	177	3.81	1.09				

Note: NS = Not Significant

Table 6 showed that the t-cal was 0.77 while the t-crit. was 1.67 hence, since the t-cal was less than the t-crit. at 373 degree of freedom, the null hypothesis of no significant difference between the responses of male and female TVET lectures on the strategic to be adopted to eliminate the challenges facing students' awareness of green skills in Colleges of Education in South-South, Nigeria was upheld. This implies that the respondents strongly agreed that the strategies can eliminate the challenges facing students' awareness of green skills in Colleges of Education in South-South, Nigeria.

Discussion of Findings

The findings of research question 1 indicates that TVET students are not aware of green skills in Colleges of Education in South-South, Nigeria. The findings of this study is in agreement with Ramlia, Rasulb and Affandic, (2019), Thirupathy and Mustapha (2020), Dmuchowski, Dmuchowsk, Baczewska and Gworek (2021), who noted that elements of green skills needs to be applied to students to enhance employability and environmental balance.

Null Hypothesis 1 revealed that there is no significance difference between the mean responses of male and female TVET students on awareness of green skills in Colleges of Education in South-South, Nigeria. This implies that TVET students are not aware of green skills in Colleges of Education in South- South geopolitical zone, Nigeria.

The findings of research question 2 revealed that TVET students strongly agreed that lack of curriculum, policies and practices, collaboration with green TVET industries, classrooms, instructional resources for different teaching methods, experienced TVET lecturers and lack of institutional exchange programmes for different green skills are challenges facing TVET students' awareness of green skills in Colleges of Education in South-South, Nigeria. This is in line with the study carried out by Ayonmike (2013), Brown (2018), Danladi, Adamu, Usman, and Doma, (2020), stressed that tertiary institutions in Nigeria lack adequate instructional materials and resources, competent teachers, classrooms and practical materials.

Null Hypothesis 2 showed that there is no significant difference between the mean responses of male and female TVET students on the challenges facing TVET students' awareness of green skills. This implies that TVET students are facing challenges of awareness of green skills in Colleges of Education in South-South, Nigeria.

The findings of research question 3 revealed that TVET students strongly agreed that integration of green curriculum, policies and practices in TVET, collaboration with Green TVET industries, instructional resources, adequate classrooms, practical equipment and materials, employment of experience TVET lecturers to expose students to courses on green skills are strategies to eliminate the challenges facing TVET students' awareness of green skills in Colleges of Education in South-South, Nigeria. The findings of this study is in line with the findings of the study carried out by Uwemeiya (2014), and Osioma (2015) and Brown (2018) 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 TVET students on the strategies to eliminate the challenges facing TVET students' awareness of green skills in Colleges of Education in South-South, Nigeria. This implies that the strategies if adopted can eliminate the challenges facing TVET students' awareness of green skills in Colleges of Education in South-South, Nigeria.

Conclusion

In the green TVET paradigm, issues relating to skills acquisition should be viewed in the overall context of education for self-reliance, employment and sustainable development. In order to respond comprehensively to the needs of economies making the transition to green economies, education and training systems need to take an integrated view of potential opportunities and constraints for green initiatives. An integrated approach takes into account how the spectrum of competencies can be addressed at different levels of education. This requires an effective green framework, policies and practices for training a highly skilled and creative workforce and talent pool that is critical to achieving a society free from environmental risks, ecological scarcities and enhance low-carbon and resource-efficient economy for sustainable development.

Recommendations

1. Colleges of Education should plan, negotiate and fund exchange programmes with industries and other countries that are already in green skill acquisition practices.
2. Federal, State government and the Colleges should equip TVET workshops with different teaching resources, equipment, tools and machines to enable lectures and students practice the skills using different teaching methods.
3. Federal, State government and the Colleges should organize in-service training for TVET lecturers to ensure consistent improvement in the quality of TVET lecturers on green skills.
4. The Federal government and NCCE should come up with sustainable green policies to augment the effort of the green TVET curriculum.
5. NCCE should design techniques to suit learner characteristics, meet their needs and develop their interest and enthusiasm.

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