



## **STRATEGIES FOR RE-ORIENTING VOCATIONAL TECHNICAL EDUCATION FOR SUSTAINABLE TECHNOLOGICAL ADVANCEMENT IN RIVERS STATE**

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**ABSTRACT:** *The study investigated the “strategies for re-orienting vocational and technical education for sustainable technological advancement in Rivers State”. The study was carried out in Rivers State. The study employed a descriptive survey research design. The population of the study was all lecturers in the three tertiary institutions in Rivers State which are 71 in total. Census sampling techniques were used, hence, the sample size of the study was 71 lecturers. The instrument used for the study was a self-designed questionnaire on a four-point rating scale. The instrument was validated and the reliability of the instrument was established using Cronbach Alpha which resulted in a 0.81 reliability coefficient index. Mean and Standard Deviation was used to analyze the research questions and hypotheses were tested using Analysis of Variance (ANOVA) at a 0.05 level of significance. The study found that promoting consistent usage of technical workshops, provision of adequate workshop equipment for practical works, assigning technology innovation to students no matter how small, utilization of collaborative instructional strategy amongst others are collective strategies for re-orienting vocational technology education for sustainable technological advancement in Rivers State. The study recommended among others that vocational and technical education administrators should facilitate the consistent use of project methods and field trips for teaching and learning in vocational education institutions. This may aid innovation among students.*

**KEYWORDS:** Strategies, Re-Orienting, Vocational and Technical Education, Sustainable, Technological Advancement.

### **INTRODUCTION**

The economic development drives the demand for expertise and a high-quality workforce in various fields of the whole society, leading to a new round of development of vocational education. In the global marketplace, a skilled workforce is a key to competitive prosperity (Cong & Wang, 2012). The economies in a number of countries have been undergoing rapid transformation in the last two decades. The most important characteristics include: (a) technological innovations, (b) intensified competition in the world market, and (c) demographic trends. These changes created new demands for more adaptable, multi-skilled, and creative labour. To meet these demands, it is necessary to reduce the gap between academic and vocational education and strengthen the co-operation between the education authorities and employment organizations as well as industries. (Tabbron & Yang (1998).



Vocational and technical education is a fundamental element of the creation and implementation of skillsets for technological innovation and transference of local knowledge from one generation to the other. According to National Policy on Education (2004), Technical and Vocational Education is used as a comprehensive term referring to those aspects of the educational process involving, in addition to general education the study of technology and related sciences and the acquisition of practical skills, attitude, understanding and knowledge related science and the acquisition of practical skills, attitude, understanding and knowledge relating to occupations in various sectors of the economic and social life of Nigerians. It further expatiated the concept of vocational and technical education to include: an integral part of general education, a means of preparing for participation in the world of work, an aspect of life-long learning and preparation for responsible citizenships, and an instrument for promoting environmentally healthy sustainable development.

Even until the end of the twentieth century, in certain countries, vocational education was considered appropriate for lower social classes and professions like automobile mechanics, plumbers, electricians, and other similar professions. However, the advent of globalization has demanded more specialized labor markets, higher levels of skills, and diversified vocational education. For years, there has been a growing awareness that general education is often too academic and does not prepare young people adequately for the world of work. Undoubtedly, as compared to general education, vocational education and training have a closer and more direct link with economic and professional development. Sequel to this growth, organizations, and enterprises are required to respond in a strategic manner to the changes which take place in order to benefit from the economic growth. They have to take drastic measures to upgrade their structures and operations and adapt the qualifications of their employees to the new challenges (Mouzakitis, 2010).

Vocational and Technical Education has been recognized as a sub-sector in the education system which is widely recognized as the engine room for technological and economic growth. Akinelu in Dokubo and Dokubo (2014), noted that vocational and technical education has in its roles to give training and impart necessary skills leading to the production of craftsmen, technicians, and other skilled personnel who will be enterprising and self-reliant. It is pertinent to note that vocational education is a unique field of study responsible for human resource development, socio-cultural development, and technological development. In effect, Dokubo (2010) showed that various studies have shed more light on the relevance of vocational education programs on the empowerment of literate and illiterate adults and poverty reductions among teeming unemployed youths in Nigeria. The role of Vocational and Technical Education in the production of skilled manpower cannot be achieved if efficient and effective teaching and examination are not maintained (Ohiwerei & Nwosu, 2013). He added that no nation can develop without vocational and technical education. Technological development is a substantial criterion used to measure the advancement of a nation. In order to achieve this, Okwelle and Ayonmike (2014) opined that technical and vocational education plays an important role in a country's human resource development through the creation of skilled manpower, improving the quality of life, and enhancing the country's industrial productivity. Vocational and technical education, therefore, equips individuals with a broad range of knowledge, skills, and necessary attitudes that are recognized as indispensable for meaningful learners in the technological enhancement of the nation (Okwelle, 2013). In simple terms, vocational and technical education has in its utmost objective to train technically skilled individuals who would be frontiers of technological advancement.



One of the roles of future planning in vocational education is to determine the exact purpose of the school units as it relates to the satisfaction of market demands and changing societies integrating skills development in the curriculum (Mouzakitis, 2010). Magaji (2015) posits that vocational and technical education system plays an important role in the economic, social and technological development of a nation because they are dynamic in nature. Vocational and technical education training also has an important role to play in raising awareness, provision of skills and values which is necessary to put sustainable development into practice. Similarly, in order to alleviate the age-long problem of graduates without employment, vocational and technical education plays the role of training the Nigerian youths in definite skills such that the gap between the labor market and the preparatory courses is bridged (Ovbiagele, 2015). Vocational education if given serious attention will produce graduates who will be self-employed and can produce goods that are of export quality thereby increasing our foreign earnings. If the youths are given the proper training in vocational education, it will create jobs for our teeming youths that are roaming in the street and this will consequently lead to a reduction in social vices such as robbery, stealing, prostitution, rapping, and drug addition.

However, the reason for the missing of the technological development track that leads to the nation being a consumer nation rather than a productive nation that resulted in the nation importing most of the simple goods they consume ranging from toothpicks to machines, failure to develop vocational-technical education has brought about bad economy, poverty, unemployment, and a mass exodus of the youths to foreign lands for greener pasture, whereas other nations followed their technological development tracks that resulted to their greatness (Uckahi & Ejiko, 2018).

According to the Federal Republic of Nigeria (2004) vocational and technical education is intended to carry out the followings as its objectives;

- i. Provision of technical knowledge and vocational skill necessary for agriculture, industrial, commercial and economic development.
- ii. To give an introduction to professional studies in engineering and other technologies.
- iii. To give room for young men and women to have an intelligent understanding of the increasing complexion of technology.
- iv. Training and imparting of necessary skills leading to the production of craft men, technicians, and other skilled personnel who will be enterprising and self-reliant.
- v. Provision of trained manpower in applied sciences, technology, and commerce, particularly at sub-professional levels.
- vi. To provide people who apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man.
- vii. Restructuring the educational system at all levels to respond effectively to the challenges and managing the impact of the information age, and in particular the allocation of development funds to education at all levels.



Nevertheless, the rate of unemployment and unskilled graduates emanating from this program clearly defined the state of vocational and technical education in Nigeria. The rate of dependency of the Nation on neighboring countries definitely revealed that vocational and technical education in Nigeria needs re-orientation towards its intending objectives. It is based on this plight that Sinnott (2004) recommended curriculum greening and development of good practice in vocational and technical education, community projects: the establishment of new links between college and community groups to promote sustainable development and management: dissemination of good sustainable development practice through the development of networks and partnerships between Local Colleges and through courses and workshops.

Mouzakitis (2010) posited that considering the present curriculum content, TVET systems should focus on enabling students to develop into productive, responsible people, well equipped for life and work in today's technology-based knowledge society. He further stated that to perform successfully, TVET should include the diversity of content, the flexibility of delivery, general practical skills, transition points allowing both horizontal (streams) and vertical (higher education) transfer. Additionally, it should be aligned with other parts of national education systems (UNESCO, 2009).

Although the traditional TVET programs before the coming of the colonial masters and introduction of western education were well organized in their own way, in that it has goals, purposes, and methods of teaching (Wodi & Dokubo 2012) nevertheless, there is a need to gear the attention of learners to experiential learning, learning by doing and practicalities of vocational theories. According to Onwenonye (2019), Nigerians have their way of imparting knowledge, skills, and aptitude to the young ones and trainees under their control. Some of the methods they adopted among others were: direct instructions, demonstrations, and questioning. And the learners must pay attention, watch carefully what the master craftsman is doing, answer and ask questions if any. Presently in the world of educational globalization teaching vocational and technical education could advance beyond the traditional methods of teaching and commence the use of modern technologies and teaching methods such as computer simulation method, collaborative learning, field trip methods, project methods among others. It is well known that a vocational education program is a hands-on experience program, therefore various researchers have advocated the use of teaching and assessment strategies that would actively engage learners in practical works. However, vocational and technical education teachers are constrained with a lack of adequate facilities to carry out efficient teaching and learning tasks. For instance, Dokubo and Dokubo (2013) indicated that only 40% of tertiary institutions in Nigeria have laboratories or workshop spaces for vocational education programs. They further stated that 60% of other institutions do not have laboratories or workshop spaces and this affects the low quality of technology programs in higher institutions. The result of this constrain is that instructors and learners may not be properly motivated for the program, which could lead to reduced enrolment and poor academic performance (Dokubo, 2007).

### **Purpose of the study**

The major objective of the study was to determine the strategies for re-orienting vocational and technology education for Sustainable Technological Advancement in Rivers State. In specific terms, the study sought to;



1. Determine the role of vocational and technical education for sustainable Technological Advancement in Rivers State tertiary institutions.
2. Determine the administrative strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State tertiary institutions.
3. Determine the teaching strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State in Rivers State tertiary institutions.

### **Research Questions**

The following research questions were asked;

1. What is the role of vocational and technical education for Sustainable Technological Advancement in Rivers State tertiary institutions?
2. What are the administrative strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State tertiary institutions?
3. What are the teaching strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State?

### **Hypothesis**

- i. There is no significant difference in the mean responses of lecturers in RSU, IAUE, and FCET (omoku) on the role of vocational and technical education for Sustainable Technological Advancement in Rivers State tertiary institutions.
- ii. There is no significant difference in the mean responses of lecturers in RSU, IAUE, and FCET (omoku) on administrative strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State tertiary institutions.
- iii. There is no significant difference in the mean responses of lecturers in RSU, IAUE and FCET (Omoku) on teaching strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State.

### **METHODOLOGY**

The study was carried out in Rivers State. The state is well known for massive oil exploration activities that been carried out in the geographical area. This activity attracted the presence of many vocational and technical organizations to the state. Consequently, vocational and technical education is a trending discipline in the study area. This, therefore, necessitated the choice of the area for the study. The study employed a descriptive survey research design. Descriptive survey design is often employed when there is need for the researchers to describe situation by using the opinion of the population concern with the subject matter (Amadi, 2020). The population of the study was all lecturers in the three tertiary institutions in Rivers State



namely, Rivers State university, Ignatius Ajuru University of Education, and Federal college of education technical Omoku. According to the departmental records and online sources (2020) there are 12, 26, and 33 vocational and technical education lecturers in RSU, IAUE and FCET respectively. Census sampling techniques were used, hence, the total population was engaged in the study. The sample size of the study was 71 lecturers. The instrument used for the study was a self-designed questionnaire titled “Strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State (SRVTESTA)” The instrument was structured in a four-point rating scale of agreement (Strongly Agree-4, Agree-3, Disagree-2 and Strongly Disagree-1). Validation of the instrument was duly carried out by distributing to experts in vocational and technology education to scrutinize in terms of relevance, appropriateness, and adequacy of items. Reliability of the instrument was established using Cronbach Alpha which resulted to 0.81 reliability coefficient index. Mean and Standard Deviation was used to analyze the research questions and hypotheses were tested using Analysis of Variance (ANOVA) at a 0.05 level of significance.

## RESULT AND DISCUSSION OF FINDINGS

**Research Question 1:** What is the role of vocational and technical education for sustainable technological Advancement in Rivers State tertiary institutions?

**Table 1: Mean responses on the role of vocational and technical education for sustainable Technological Advancement in Rivers State tertiary institutions**

		RSU=12		IAUE=26		FCET=33		Ave.	Rmrk
								Mean	
S/N	Items								
1	Developing human resources towards current technology usage	3.65	0.56	3.40	0.63	3.76	0.33	3.60	Agreed
2	creation of skilled manpower in technology management and operation	3.54	0.64	3.59	0.53	3.68	0.53	3.60	Agreed
3	Enhancing the country’s industrial productivity.	3.04	0.78	3.34	0.76	3.49	0.69	3.29	Agreed
4	Equipping learners with operational skills in technology	3.21	0.84	3.11	0.82	3.29	0.71	3.20	Agreed
5	Development of innovative technologies for workshop operation	3.67	0.64	3.60	0.43	3.52	0.84	3.60	Agreed
6	Dissemination of good sustainable development practice through the development of networks and partnerships between colleges and industries	3.21	0.83	3.66	0.54	3.63	0.66	3.50	Agreed



7	Engaging in in-depth research on technological operation and innovation	3.06	0.89	3.32	0.63	3.52	0.69	3.50	Agreed
8	Promoting external links with colleges in the developed countries	3.40	0.73	3.22	0.55	3.64	0.51	3.42	Agreed
9	Encouraging the procurement of sophisticated technologies from other nations	3.66	0.62	3.89	0.42	3.62	0.64	3.72	Agreed
10	enhancing student recruitment potential by providing evidence of responsible practice	3.82	0.32	3.39	0.51	3.89	0.33	3.70	Agreed

*Field Survey, 2020*

Table 1 presents the role of vocational and technical education for sustainable technological Advancement in Rivers State tertiary institutions. Based on the mean decision rule, items 1-10 were accepted by the three groups of respondents. This shows that the stated items are roles of vocational and technical education for sustainable technological advancement. This finding conforms with Magaji (2015) who observed that vocational and technical education system plays an important role in the economic, social and technological development of a nation because they are dynamic in nature. He further added that vocational and technical education training also has a substantial role to play in raising awareness, provision of skills, and values that are necessary to put sustainable development into practice. To support this, Dokubo and Dokubo (2014), noted that vocational and technical education has in its roles to give training and impart necessary skills leading to the production of craftsmen, technicians, and other skilled personnel who will be enterprising and self-reliant.

**Research Question 2:** What are the administrative strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State tertiary institutions?

**Table 2: Administrative strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State tertiary institutions**

S/N	Items	RSU=12	IAUE=26	FCET=33	Ave. Mean	Remark			
11	Funding of the vocational-technical program	3.06	0.96	3.44	0.58	3.22	0.74	3.24	Agreed
12	Promoting consistent usage of the technical workshop	3.11	0.73	3.31	0.67	3.03	0.89	3.15	Agreed
13	Provision of adequate workshop equipment for practical works	3.22	0.70	3.10	0.83	3.31	0.59	3.21	Agreed



14	Recruiting skilled workshop instructors	3.30	0.64	3.00	0.96	3.03	0.96	3.11	Agreed
15	Encouraging fabrication of tools and equipment within technical workshop	3.01	0.94	3.08	0.84	3.20	0.84	3.10	Agreed
16	Enforcing the necessity of technological innovation among learners	3.23	0.73	3.32	0.63	3.21	0.70	3.25	Agreed
17	Assessing technical creativity of students before issuing the certificate	3.09	0.90	3.00	0.81	2.83	1.09	2.97	Agreed
18	Encouraging teachers' use of field trip for teaching and exposition	3.22	0.63	3.01	0.99	3.02	0.81	3.08	Agreed
19	Enhancing college partnerships with technical organizations	3.12	0.81	3.10	0.94	3.08	0.74	3.16	Agreed

*Field Survey, 2020*

Table 2 shows administrative strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State tertiary institutions. Based on the criterion mean value, items 11-19 had men responses beyond the criterion mean value. This implies that respondents agreed that item 11-19 are strategies administrators of vocational and technical education can put into play for re-orienting vocational technology education for sustainable technological advancement. The findings are in conformity with Mouzakitis (2010) who posited that the present curriculum content in TVET systems should primarily focus on enabling students to develop into productive, responsible people, well equipped for life and work in today's technology-based knowledge society. In support of this is Sinnott (2004) who in his study recommended curriculum screening and development of good practice in vocational and technical education, community projects: the establishment of new links between college and community groups to promote sustainable technology development and management.

**Research Question 3:** What are the teaching strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State?





**Table 3: Teaching strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State**

S/N	Items	RSU=12		IAUE=26		FCET=33		Ave. Mean	Remark
20	Assigning technology innovation to students no matter how small	3.00	1.06	3.04	0.98	3.10	0.90	3.05	Agreed
21	Utilization of collaborative instructional strategy.	2.91	1.12	3.01	0.90	3.03	0.94	2.98	Agreed
22	Taking students on a field trip to technical industries	2.86	1.20	2.60	1.01	3.31	0.73	2.92	Agreed
23	Concentrating a larger part of students' grading on their psychomotor ability	2.70	0.99	2.62	0.99	3.03	0.92	2.78	Agreed
24	Utilization of computer simulation during a lecture	2.91	1.09	2.78	1.03	3.20	0.80	2.96	Agreed
25	Exposing students to technological possibilities in developed countries	3.01	0.95	2.79	1.02	3.21	0.89	3.00	Agreed
26	Promoting technological innovations during students' final project	2.64	1.02	3.00	0.98	2.83	1.01	2.82	Agreed
27	Encouraging a fair grading system void of corruption	2.94	1.21	3.21	0.97	3.02	0.83	3.06	Agreed
28	Enforcing the use of instructional materials in teaching	3.04	1.04	3.10	1.01	3.08	0.83	3.07	Agreed

*Field Survey, 2020*

Table 3 shows teaching strategies for re-orienting vocational and technology Education for Sustainable Technological Advancement in Rivers State. Based on the mean decision rule, item 20-28 are accepted by the three groups of respondents as teaching strategies that can re-orientate vocational and technology education for sustainable technological advancement in Rivers State. The findings align with Onwenonye (2019) who noted that for vocational and technical education be properly impacted in this modern world vocational teachers need to utilize students' center method of teaching. He further proposed that learners should be actively engaged in every subject to be learned in the program.



## Hypotheses

- i. There is no significant difference in the mean responses of lecturers in RSU, IAUE, and FCET (omoku) on the role of vocational and technical education for sustainable Technological Advancement in Rivers State tertiary institutions.

**Table 4: One-way Analysis of Variance on the role of vocational and technical education for sustainable Technological Advancement in Rivers State tertiary institutions.**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	0.185	2	0.092	1.736	.194
Within Groups	3.657	69	0.053		
Total	3.842	71			

*Field Survey, 2020*

Table 4 presents an analysis of variance on the mean responses of lecturers in RSU, IAUE, and FCET on the role of vocational and technical education for sustainable Technological Advancement in Rivers State tertiary institutions. The table reveals that the significant level of the p-value is 0.194 which is greater than the level of significance (0.05). Therefore, the null hypothesis was rejected. This implies that there is no significant difference in the mean responses of lecturers in RSU, IAUE, and FCET (Omoku) on the role of vocational and technical education for sustainable Technological Advancement in Rivers State tertiary institutions

- ii. There is no significant difference in the mean responses of lecturers in RSU, IAUE, and FCET (omoku) on administrative strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State tertiary institutions.

**Table 5: One-Way Analysis of Variance on the administrative strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State tertiary institutions**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.014	2	.007	.367	.697
Within Groups	.455	24	.019		
Total	.469	26			

*Field Survey, 2020*

Table 5 presented the analysis of variance on the mean responses of lecturers in RSU, IAUE, and FCET on the administrative strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State tertiary institutions. The table revealed that the significant level of the p-value is 0.697 which is greater than the level of



significance (0.05). Therefore, the null hypothesis was rejected. This implies that there is no significant difference in the mean responses of lecturers in RSU, IAUE, and FCET (omoku) on administrative strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State tertiary institutions

- iii. There is no significant difference in the mean responses of lecturers in RSU, IAUE, and FCET (Omoku) on teaching strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State.

**Table 6: One-Way Anova on the mean responses of lecturers on the teaching strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.223	2	.111	3.937	.073
Within Groups	.679	24	.028		
Total	.902	26			

*Field Survey, 2020*

Table 6 presented the analysis of variance on the mean responses of lecturers in RSU, IAUE, and FCET on the teaching strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State. The table revealed that the significant level of the p-value is 0.073 which is greater than the level of significance (0.05). Therefore, the null hypothesis was accepted. This implies that there is no significant difference in the mean responses of lecturers in RSU, IAUE, and FCET (omoku) on teaching strategies for re-orienting vocational Technology Education for Sustainable Technological Advancement in Rivers State tertiary institutions.

## CONCLUSION

Based on the findings of the study, it was concluded that vocational and technical education has an essential role to play in sustaining technological advancement in any nation. Also, the study identified teaching and administrative strategies to be adopted in tertiary institutions for sustainable technological advancement in Rivers State.

## RECOMMENDATION

In accordance with the findings of the study, it was recommended that-

- The government should give much more preference to vocational and technical programs in tertiary institutions, having known that vocational and technical education is essential for technological sustainability.



- Teachers of vocational and technical education should be motivated in terms of incentives and upgrade in salaries so as to passionately impact technological skills to the upcoming generation. This would help sustain technological development in our nation.
- Vocational and technical education administrators should facilitate the consistent use of project methods and field trips for teaching and learning in vocational education institutions. This may aid innovation among students.

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