Original Article

Enhancing Electrical/Electronics Skills Acquisition Among Technical College Students For Sustainable Industrial Development In Rivers State

[1]Njoku, Ndubueze Anthony & [2]Ewe, Ugochukwu Clement

[1]Department Of Industrial Technical Education, Ignatius Ajuru University Of Education, Rumuolumeni, Port Harcuort, Rivers State, Nigeria.

[2]Department Of Technology And Vocational Education, Enugu State University Of Science And Technology, Enugu, Nigeria.

E-mail:
[1]njokuanthony76@gmail.com
[2]okayaukwu@gmail.com

Phone:
[1]08063380929
[2]07061148913

ABSTRACT

The purpose of the study was to determine the strategies for enhancing electrical/electronics skills acquisition among technical college students for sustainable industrial development in Rivers State. Two research questions were formulated in line with the purpose of the study and two null hypotheses were tested at the.05 level of significance. The study adopted a survey research design. The population for the study was 25 respondents (comprising 15 electrical/electronics teachers and 10 electrical/electronics workshop instructors) in technical colleges in Rivers State. There was no sampling as the population was manageable. A twenty-five item questionnaire was designed to collect data for the study. The instrument was validated by three experts. Cronbach's Alpha reliability coefficient was used to determine the internal consistency of the instrument which stood at .81. The data collected for the research questions which guided the study were answered using mean and standard deviation, whereas the null hypotheses were tested using t-test. The results of the study showed that the ability to differentiate ac from dc machine, solder faulty resistor, inductor and capacitor among others are practical skills centred strategies required of electrical/electronics technical college students for sustainable industrial development in Rivers State. Also, work with materials both manual and powered efforts, performing of scientific experiment relevant to getting work completed, among others are some innovational strategies for enhancing the skills acquisition of the students for sustainable industrial development. It was recommended that teachers should be retrained from time to time to keep abreast of innovation on the strategies for enhancing practical skills acquisition of technical college students especially in Rivers State

Keywords: Technology, Electrical/Electronics, Skill Acquisition, Development, Sustainable Industrial Development.

Introduction

Technology is the practical application of scientific knowledge. Udechukwu (2022) defined technology as a practically oriented science developed in a community to deal with the basic human needs. Technology is in effect developed to produce human needs such as foods, cloth, shelter, transportation, communication techniques, industrial raw materials, sewage and storage systems. According to Nevkar (2007) as cited in Puyate (2011), technology is the

How To Cite This Article: Njoku, N. A., & Ewe, U. C. (2022). Enhancing Electrical/Electronics Skills Acquisition Among Technical College Students For Sustainable Industrial Development In Rivers State. *International Technology Research Journal*, *8*(1), 19–26. Retrieved from https://interj.net/index.php/itrj/article/view/4

application of knowledge of science, mathematics and engineering in the design, analysis, synthesis and production of goods and services as a means of solving societal problems. Onyia (2011) posited that the primary aim of technology and vocational education is to prepare individual for the world of works and possibly develop their other potentials for work. If there is any field of human endeavours where technology changes rapidly, is the electrical/electronics technology.

Electrical/electronics technology is a branch of technology that deals with lighting such as the use of electric current, gas lamp among others and the flow of electron along a conductor as well as in communication technique such as use of telephone, telex, television, radio message and satellite. Electrical/electronics is the pivot of technological growth and development. Most technological changes depend on electricity (Ogbuanya, et.al, 2012). Appliances cannot operate without electricity bringing about the technological development witnessed today. These appliances include various domestic and industrial machines, computers, audio and visual gadgets among others. Its importance notwithstanding, electricity involves a lot of hazards. Ogbuanya et.al, (2012) described electricity, as a good servant but a bad master. Hence, electrical/electronics teachers with varying qualification, knowledge and skills need to update their knowledge and skills through regular training, in order not to be outdated. According to Uzoagulu (2011), many countries are described today as developed due to their technological feats and manoeuvres. The importance of technology to a nation's development cannot be over emphasized. Technological skill acquisition is best acquired at school age. Technical teachers are expected to be equipped in order to impart such skills to technical students.

Skill acquisition is one of the surest ways through which young people can find ways into the labour market either in the public or private sector. Skill, according to Iloka (2010) is a manual dexterity through repetitive performance of an operation. This connotes mastery. Idigie et.al, (2017) stated that the acquisition of requisite skills is a means of increasing the productive power of a nation; hence, the Nigerian society should recognize the fact that every citizen should be well equipped to contribute effectively to the welfare of the country. Skill acquisition varies in nature and complexity according to the trade involved. Individuals who opt for vocational & technical education should, among other things, possess qualities such as interest, ability, aptitude, patience, personality characteristics and other physical qualities that would enable them succeed in it. Amadi et al.(2022) defined skill acquisition as the ability to train individual on a particular task or function so that they become an expert in it. Since the acquisition of appropriate skills is essential for the individual, to contribute to the development of the society, there is the need for provision of the acquisition of skills in technical colleges. These skills require some strategies for their acquisition.

Strategies are plans of action designed to achieve a long-term or overall aim. According Njoku et al. (2017), strategies entail where you will focus your efforts to achieve your goals and how you will succeed. It defines a specific course of action that will take one from where one is now to where one wants to be. In this context, strategies could be practical skills centred or innovational. Practical skills centred strategies are strategies that involve the acquisition of practical skills for sustainable industrial development. Some of the practical skills centred strategies are ability to identify key elements appliances, ability to select tools for repair, installation of MICC cable among others. Also, innovational strategies are those that employ transformational and modernized strategies for enhancing skills acquisition. The innovational strategies include: observation of all necessary safety precautions when operating in the field, working with materials both manual and powered efforts, using required consumable materials for work among others. Skill acquisition is important to the students of electrical/electronics in technical colleges for self-employment and sustainable industrial development.

The acquisition of electrical/electronics skills in technical colleges depends more on the technical teachers. Electrical/electronics teachers should be professionally qualified and occupationally competent as to impart the required skills to the electrical/electronics students. It is unfortunate that some electrical/electronics teachers are not knowledgeable and skilled, and the wrong methods of teaching adopted do not promote skill acquisition since no student can claim to posses more

knowledge and skill than the teacher in any subject (Uzoagulu, 2011). Lack of workshops/laboratories, equipment and materials are some problems that affect skill acquisition in electrical/electronics subjects in technical colleges. Uzor (2014) stated that the amount of knowledge and skill imparted to the students should meet the demand of industries and work place and that, the academic environment in technical colleges ought to be replica of what is found in industries. This can be attained and enhanced among others only if the teachers and workshop instructors are qualified, workshops/laboratories fully equipped because no meaningful learning occurs in a void of all these resources and facilities. Datol (2012) opined that in a globally competitive economy, skills acquisition is required by technical students for self-employment and sustainable industrial development.

Development is the process that creates growth, progress, positive change or the addition of physical, economic, environment, social and demographic components. According to MDG Monitor (2016), development is defined as a word that is widely used to refer to a specified state of advancement or growth. It could also be used to describe a new and advanced ideas or product or an event that constitutes a new state under changing circumstances. Ntegwung and Njoku (2022) posited that development could be sustainable. Though, sustainable development is critical in that its concept has yet to be fully defined, as is evident from the constant revisions, extensions and refinements of the term. The only certainty about the term according to Lawal (2014) is that sustainable development entails relations among these key components: social, economic and environmental factors. The United Nations World Commission on environment Development argues that development can only be considered sustainable if it addresses the needs of the present without endangering the capabilities of future generations to meet their needs. Sustainable development can be defined as the equality of opportunities for well-being. It needs the consideration of certain objectives that if ignored, can slow down or even reverse development in other areas. Sustainable development is development that meets the needs of the present generation, without compromising the ability of future generation, to meet their own needs. The importance of linking skill acquisition with sustainable development cannot be over emphasized (Agommuoh & Ndirika, 2017). Other areas of sustainable development include: sustainable self-employment, sustainable economic development, sustainable manpower development, sustainable socio-economic development, and sustainable industrial development among others.

Sustainable industrial development is a type of development which ensures that resources are used conservatively and efficiently (Lokko, et al.2018). To achieve resource productivity, manufacturers must optimize the supply circle, analyzing how raw materials are extracted, how components are produced, how products are designed and how return markets are organized. Sustainable industrial development works to minimize the environmental footprint while maintaining economic growth, social advancement and quality of life. Some of the benefits of sustainable industrial development according to Kachollom (2018) are its economic value, social advancement and improved quality of life and environmental protection. A nation that aims at achieving a just and sustainable future cannot afford to ignore the rights, dignity and capabilities of technical students who form greater percentage in a country, like Nigeria and state like Rivers State.

Rivers State is one of the 36 States of Nigeria. Its capital, Port Harcourt is the largest city and is economically significant as the centre of Nigeria's oil industry. Rivers State is bounded on the South by the Atlantic Ocean, to the North by Imo and Abia States, to the East by AkwaIbom State and to the West by Bayelsa and Delta States. Rivers State currently consists of 23 Local Government Areas with four technical colleges. The state experiences industrial activities yet with nothing to show in terms of sustainability of these industrial ventures. There are many cases of failed industrial attempts even in electrical/electronics in Rivers State. Hence, the study sought to find out the strategies for enhancing electrical/electronics skills acquisition among technical college students for sustainable industrial development in Rivers State.

Statement of the Problem

Rivers State is an important case study of an industrious state in Nigeria. The state has experienced a pervasive industrial activity for over a decade, such as in agriculture, fabrication and welding, automobile workshops, electrical and

electronics enterprises among others. Yet alarming rate of unemployment is experienced in the state as a result of the inability of the owners of these enterprises to sustain them. Despite the need for sustainable industrialization and development, there seems to be gap in the possession of practical skills for such sustainability in industrialization. The selected few that possess these practical skills lack strategies to enhance them. Therefore, there is the need to ascertain the strategies for enhancing electrical/electronics skills acquisition among technical college students for sustainable industrial development in Rivers State.

Purpose of the Study

The main purpose of the study was to determine the strategies for enhancing electrical/electronic skills acquisition among technical college students for sustainable industrial development in Rivers State. Specifically, the study sought to determine the:

1. practical skills centred strategies for enhancing skills acquisition of electrical/electronicstechnical college students for sustainable industrial development in Rivers State.
2. innovational strategies for enhancing the skills acquisition of electrical/electronics technical students for sustainable industrial development in Rivers State.

Research Questions

The following research questions guided the study:

1. What are the practical skills centred strategies for enhancing skills acquisition of electrical/electronics technical college students for sustainable industrial development in Rivers State?
2. What are the innovational strategies for enhancing the skills acquisition of electrical/electronics students for sustainable industrial development in Rivers State?

Hypotheses

The following null hypotheses were tested at .05 level of significance:

1. There is no significant difference between the mean responses of teachers and workshop instructors on the practical skills centred strategies for enhancing skills acquisition of electrical/electronics technical college students for sustainable industrial development in Rivers State.
2. There is no significant difference between the mean responses of teachers and workshop instructors on the innovational strategies for enhancing the skills acquisition of electrical/electronics technical college students for sustainable industrial development in Rivers State.

Methodology

The research design adopted in this study is survey design. This is because the study collected and analyzed data from the entire electrical/electronics teachers and workshop instructors in technical colleges in Rivers State. Nworgu (2015) defined survey design as one in which a group of people or items are studied by collecting and analyzing data from only a few people or items considered to be a representative of the entire group or by collecting and analyzing data from the entire people or items. The area of the study was technical colleges in Rivers State. There are four technical colleges in Rivers State and all of them have electrical/electronics department.

The population for the study was made up 25 respondents. This consisted of 15 electrical/electronics teachers and 10 electrical/electronics workshop instructors from the four technical colleges. All the members of the population were used for the study. The questionnaire was the instrument used for eliciting responses from the respondents. The questionnaire was divided into two sections- A and B. Section 'A' sought information on the background of the respondents while section 'B' was made up of two parts: part 1 and part 2. Part 1 contained 15 items which sought information on the practical skills centred strategies for enhancing skills acquisition of electrical/electronics technical college students for sustainable industrial development in Rivers State and part 2 contained 10 items which sought information on the innovational strategies for enhancing skills acquisition of electrical/electronics technical college students for sustainable industrial development in Rivers State. A total of 25 items structured questionnaire was developed by the researchers. The questionnaire utilized a 4-point scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) with the assigned scores of 4, 3, 2 and 1 respectively.

Three experts validated the instrument. Two from the Department of Technical Education and one

from the Department of Educational Psychology (Measurement and Evaluation), Ignatius Ajuru University of Education, (IAUE), Rumuolumeni, Port Harcourt, Rivers State. The inputs of the experts helped in modifying the instrument. The instrument was trial tested at a technical college in Bayelsa State using 10 electrical/electronics teachers and 5 electrical/electronics workshop instructors. A test of reliability using Cronbach's Alpha method was conducted to determine the internal consistency of the items through trial testing. An internal consistency reliability estimate of .85 was obtained for part 1 of the questionnaire and part 2 yielded internal consistency reliability estimates of .76. The average of the two clusters stood at .81. The researchers distributed and collected the questionnaire on the spot and there was a 100% return rate of the questionnaire. The data collected for this study were analyzed using mean and standard deviation for the research questions and t-test for testing the hypotheses at the .05 level of significance. The responses to the items were interpreted using seen below:

Strongly Agree (SA)	=	3.50 - 4.49
Agree (A)	=	2.50 - 3.49
Disagree (D)	=	1.50 - 2.49
Strongly Disagree (SD)	=	0.50 - 1.49

Also, any item whose calculated significance is less than .05 was regarded as significant(S) while any item whose calculated significance is above .05 was regarded as not significant (NS).

Result

Research Question 1:

What are the practical skills centred strategies for enhancing skills acquisition of electrical/electronics technical college students for sustainable industrial development in Rivers State?

Table 1: Mean and Standard Deviation Responses of Electrical/Electronics Teachers and Workshop Instructors on the Practical Skills centred Strategies for Enhancing Skills Acquisition of Electrical/Electronics Technical College Students for Sustainable Industrial Development in Rivers State.

S/N	Practical Skills Centred Strategies	Teachers (N = 15)			Workshop Instructors (N = 10)			Overall (N=25)		
		X	SD	Dec	X	SD	Dec	X	SD	Dec
1.	Ability to identify key elements appliances	3.20	1.02	A	3.23	.04	A	3.22	.53	A
2	Ability to select tools for repairs	3.20	.97	A	3.04	.31	A	3.12	.64	A
3	Demonstrate conduit on board	3.10	1.15	A	3.26	.39	A	3.18	.77	A
4	Install MICC cable	2.87	1.07	A	3.20	.49	A	3.04	.78	A
5	Identify different wiring types	3.40	1.01	A	3.22	.40	A	3.31	.71	A
6	Identify incandescent lamp, tungsten filament lamp, filament lamp.	3.00	.00	A	3.00	.00	A	3.00	.00	A
7	Explain duct wiring	3.50	.90	SA	3.22	.40	A	3.36	.65	A
8	Differentiate AC from DC machine	2.92	1.02	A	3.22	.40	A	3.07	.71	A
9	Differentiate AC and DC motors from generator	2.56	1.20	A	3.10	.40	A	2.83	.8	A
10	Ability to solder faulty resistor, inductor, capacitor	3.02	1.04	A	3.02	.40	A	3.02	.72	A
11	Ability to replace ICS	3.00	1.06	A	3.46	.49	A	3.23	.78	A
12	Identify neon tube, hot and cold cathode	2.81	1.01	A	3.18	.37	A	3.00	.69	A
13	Fixing faults in VGA assembly	3.40	.96	A	3.32	.48	A	3.36	.72	A
14	Removal and replacement of drives	3.20	.97	A	3.41	.48	A	3.31	.73	A
15	Fixing faults in AC power supply terminal/circuit	2.56	1.20	A	3.33	.49	A	2.95	.85	A
	Cluster Mean/SD	**3.05**	**.97**	**A**	**3.21**	**.37**	**A**	**3.13**	**.67**	**A**

Results in table 1 revealed that all the 15 items had their overall mean responses as 3.13, indicating that the respondents agreed to a great extent with all the items as the practical skills centred strategies for electrical/electronics technical college students for sustainable industrial development in Rivers State. The standard deviation also ranged from .00 to 1.20 indicates homogeneity of opinions. This is confirmed by the low overall standard deviation of .67. The grand mean for teachers is 3.05 and that of workshop instructors is 3.21. These affirm the 'agree' option indicated by the respondents as the

practical skills centred strategies for electrical/electronics technical college students for sustainable industrial development in Rivers State.

Hypothesis 1

There is no significant difference between the mean responses of teachers and workshop instructors on the practical skills centred strategies for electrical/electronics technical college students for sustainable industrial development in Rivers State.

Table 2: t-Test Result of Mean Responses of Teachers and Workshop Instructors on the Practical Skills Centred Strategies of Electrical/Electronics Technical College Students for Sustainable Industrial Development in Rivers State.

Respondents	N	X	SD	Df	t-cal	t-tab	P	Decision
Teachers	15	3.05	.97	23	1.62	1.96	.05	NS
Workshop Instructors	10	3.21	.37					

The analysis in table 2 shows that t-value at .05 level of significance and 23 degree of freedom for 15 items had their t-calculated value as 1.62, while the table t-value is 1.96. Since the table t-value is more than the t-calculated, the null hypothesis is therefore not rejected for these items. This implies that no significant differences exist between the mean responses of teachers and workshop instructors on the practical skills centred strategies of electrical/electronics technical colleges students for sustainable industrial development in Rivers State.

Research Question 2:

What are the innovational strategies for enhancing the skills acquisition of electrical/electronics technical college students for sustainable industrial development in River State?

Table 3: Mean and Standard Deviation Responses of Teachers and Workshop Instructors on the Innovational Strategies for Enhancing Skills Acquisition of Electrical/Electronics Technical College Students for Sustainable Industrial Development in Rivers State.

S/N	Innovational Strategies for enhancing electrical/electronics skills acquisition	Teachers (N = 15)			Workshop Instructors (N = 10)			Overall (N=25)		
		X	SD	Dec	X	SD	Dec	X	SD	Dec
1.	Observe all necessary safety precautions when operating in the field	3.02	1.02	A	3.20	.04	A	3.11	.71	A
2	Work with materials both manual and powered efforts	3.30	1.01	A	3.30	.46	A	33.74	.74	A
3	Use required consumable materials for work	3.20	1.10	A	3.10	.30	A	3.15	.07	A
4	Perform scientific experiment relevant to getting work completed	2.50	1.18	A	3.30	.46	A	2.9	.82	A
5	Develop high sense of responsibility to enhance skill	3.02	.82	A	3.40	.49	A	3.29	.66	A
6	Initiate innovations to improve skills in elect/elect tech.	3.02	1.40	A	3.10	.30	A	3.06	.67	A
7	Maintain high sense of sincerity in the field	3.01	.76	A	3.20	.40	A	3.11	.58	A
8	Ability of teachers to create module of course for elect/elect students	3.40	1.05	A	3.10	.30	A	3.25	.68	A
9	Students should possess qualities such as interest, patience, aptitude and ability in the field area.	3.36	.75	A	3.10	.30	A	3.23	.54	A
10	Provide maintenance services of tools used in duty places	3.14	1.05	A	3.33	.49	A	3.24	.77	A
	Cluster Mean/SD	**3.10**	**1.01**	**A**	**3.21**	**.35**	**A**	**3.16**	**.68**	A

Results in table 3 revealed that all the 10 items had their overall mean responses as 3.16 indicating that the respondents agreed to a great extent with all the items as innovational strategies for enhancing the skills acquisition of electrical/electronics technical college students for sustainable industrial development in Rivers State. The standard deviation ranged from .04 to 1.40 indicating that their opinions are the same. The low overall standard deviation of .68 affirms this homogeneity. The grand means of 3.10 and 3.21 for teachers and workshop instructors respectively affirm the items in the questionnaire as

the innovational strategies for enhancing technical college students' skills acquisition in electrical/electronics for sustainable industrial development in Rivers State.

Hypothesis 2

There is no significance difference between the mean responses of teachers and workshop instructors on the innovational strategies for enhancing skills acquisition for electrical/electronic technical college students for sustainable industrial development in Rivers State.

Table 4: t-Test Result of Mean Responses of Teachers and Workshop Instructors on the Innovational Strategies for Enhancing Skills Acquisition for Electrical/Electronic Technical CollegeStudents for Sustainable Industrial Development in Rivers State.

Respondents	N	X	SD	Df	t-cal	t-tab	P	Decision
Teachers	15	3.10	1.01	23	.42	1.96	.05	NS
Workshop Instructors	10	3.21	.35					

The analysis in table 4 shows that t-value at .05 level of significance and 23 degree of freedom for 10 items had their t-calculated value as .42, while the table t-value is 1.96. Since the table t-value is more than the t-calculated, the null hypothesis is therefore not rejected for these items. This implies that no significant differences exist between the mean responses of the teachers and workshop instructors as the innovational strategies for enhancing skills acquisition of electrical/electronic technical college students for sustainable industrial development in Rivers State.

Discussion of Findings

The findings in table 1 showed that the respondents agreed with all the items as practical skills centred strategies for enhancing skills acquisition of electrical/electronicstechnical college students for sustainable industrial development in Rivers State. The finding agrees with Iloka (2010) who posited that skill is a manual dexterity through repetitive performance of an operation. The study showed that there is o significant difference between the mean responses of teachers and workshop instructors on the practical skills centred strategies for enhancing skills acquisition of electrical/electronics technical college students for sustainable industrial development in Rivers State. This is consistent with Idigie, et. al, (2017) who in their studies observed that the acquisition of requisite skills is a means of increasing the productive power of a nation.

Results in table 3 revealed that all the items are the innovational strategies for enhancing the electrical/electronics skills acquisition among technical college students for sustainable industrial development in Rivers State. This finding corresponded with Uzor (2014) who noted that knowledge and skills impacted to the students should meet the demand of industries and work place for effective production. The study also showed that there is no significant different between the mean responses of teachers and workshop instructors on the strategies for enhancing the electrical/electronic skills acquisition of technical college students for sustainable development in Rivers State. The finding is in agreement with Agommuoh andNdirika (2017) who stated that certain strategies are required for enhancing the students' skills acquisition of any field.

Conclusion

Based on the findings of the study, it is concluded that certain strategies are needed by technical teachers and workshop instructors for enhancing the skills acquisition among technical college students. These skills acquired by the electrical/electronic college students will sustain them in an unstable economy like Nigeria. Some of the innovational strategies for enhancing electrical/electronic skills acquisition among technical college students are ability of teachers to create module of course for electrical/electronics students, observing all necessary safety precautions when operating in the field among others.

Recommendations

In the light of the findings of the study, the following recommendations are made:

1. Teachers should be retrained from time to time to keep abreast of innovation on the strategies for enhancing practical skills acquisition on the students.
2. Students should always be interested in the acquisition of skills for sustainable industrial development.

References

Agommuoh, P.C. & Ndirika, M. (2017). Strategies for promoting gender equality in STEM education towards sustainable development. In A.S. Ifamuyiwa (Ed.) *Science Teachers Association of Nigeria, 60th Anniversary Conference*

Proceedings (PP 298-303), Port Harcourt: STAN Place Ltd.

Amadi, I. A., Igweagbara, S. N. &Chukwuladi, H. N. (2022). Skill acquisition on automatic water level control switch in electrical installation work students in technical education Universities in Rivers State. *Book of Proceedings for 6th Annual Conference of the Faculty of Vocational & Technical Education, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, Rivers State, Vol1*, 1-10, Held between 7th and10th, December.

Datol, I. G. (2012). *Vocational guidance and entrepreneurship*. Akins Press and Services

Idigie, K.J.S., Nja, C.O. & Ugwu, A.N. (2017). Integrating resource-person for acquisition of entrepreneurial skills among chemistry students in Calabar education zone, Cross Rivers State, Nigeria. In A.S. Ifamuyiwa (Ed.), *Science Teachers Association of Nigeria 60th Anniversary Conference Proceedings* (PP 252-258). Port Harcourt: STAN Place Ltd.

Iloka, A.M.C. (2010). Introduction to entrepreneurship education in Nigeria. In J.O. Ogbuagu and A.T. Nwamaradi, (Eds.), *Skill Development in Science/Technology Education for MDGs*(PP 210-221).

Kachollom, B. L. (2022). Collaborative food security: An antidote for sustainable peace in Nigeria. *African Journal of Educational Archives, 8*(1), 39-49.

Lawal, A. W. (2014). Technical and vocational education: A tool for national development in Nigeria. *International Journal of Social and Humanistic Science, 14*(1), 53-59.

Lokko,Y., Heijde, M., Schebesta, K., Scholtes, P. & Van, M.(2018). Biotechnology and the bioeconomy towards inclusive and sustainable industrial development. *New Biotechnology*, 40, 5-10

MDG Monitor (2016). What is development?- A definitive guide. *www.mdgmonitor.org/what-is-development*.

Njoku, N.A., Ewe, U. C. & Alio, A.N. (2017). Strategies for improving the use of ICT facilities in teaching and learning of electronics works in technical colleges in Rivers State. *Journal of Research in Science and Technology, 7*(2), 86-96.

Ntegwung, G. J. & Njoku, N. A. (2022). Repackaging technical vocational education and training (TVET) for sustainable national development. African Journal of Educational Archives, 8(1),136-146.

Nworgu, B. G. (2015). *Educational research, issues and methodology (3rd ed.)*. University Trust Publisher

Ogbuanya, T.C., Abdullahi, S. & Ado, Y.K. (2012). Electrical installation competencies required by electrical/electronic teachers in Northern Nigerian Technical Colleges. *Nigerian Vocational Association Journal (NVAJ)*, 17 (2), 255 – 269.

Onyia, A. U. (2011). Re-focusing technology and vocational education systems for life-long learning in Enugu State. *International Technology Research Journal, (INTERJ), 2*(1), 34-40.

Puyate, S. T. (2011). Technology and major innovations in Nigeria. *International Technology Research Journal (INTERJ), 2*(1). 1-5

Udechukwu, O. (2022). *Excellent key facts introductory technology for junior secondary schools.* A.C.Global Publishing Co.

Uzoagulu, A.E. (2011). *Practical guide to writing research project reports in tertiary institutions*. Enugu: Cheston Ltd.

Uzor, K.I. (2014). Strategies for the preparation of undergraduates of electrical/electronics technology for employment in Enugu State. *Journal of Studies in Education,8* (1), 156 – 162.