



# **Electrical Installation And Maintenance Works Skills For Sustainability Amongst Graduates Of Technical Colleges In Rivers State**

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## **ABSTRACT**

The study investigated electrical installation and maintenance trades skills strategies for sustainability amongst graduates of technical colleges in Rivers State. The study adopted descriptive survey research design. The population of the study comprised 25 graduates of electrical/electronics in rural areas, 60 graduates of electrical/electronics in urban areas and 15 technical college teachers sampled purposively. Two research questions were raised and answered using mean and standard deviation while two hypotheses formulated were tested using Analysis of Variance (ANOVA) at .05 alpha level of significance. The computation of the mean and ANOVA were carried out with Statistical Package for Social Sciences (SPSS). The instrument used for data collection was a 20-item structured questionnaire titled "Electrical Installation and Maintenance Trades Skills Questionnaire (EIMTSQ)", designed in the pattern of a 4-point modified rating scale validated(face and content) by three experts. The reliability of the instrument was .89. Findings revealed that electrical installation work skills such as ability to plan the layout and installation of wiring, Test electrical work for safety, Effectives use of materials, and maintenance skills akin to forecasting of spare parts, analysis of repetitive drawing, equipment failure, assessing needs for equipment replacements, ability to assume optimization of the maintenance organization structure were highly required for job creation, self reliance and sustainability. It was therefore recommended amongst others that all the identified skills should be integrated into the curriculum of technical colleges for training of students and that Government should endeavour to finance and equip technical college workshops as to encourage more training and equipment of students with necessary skills for job creation, self reliance and sustainability upon graduation in Rivers State.

**Keywords:** Technical Vocational Education, Technical College, Electrical/Electronics, Electrical Installation and Maintenance Work, Sustainability.

## **INTRODUCTION**

Technical and Vocational Education (TVE) unrelentingly, is the trendy and unique system by which trained manpower is produced for economic and industrial growth of any country of the world including Nigeria. The Federal Republic of Nigeria however, stated in her National Policy on Education (2013) that, "Technical and Vocational Education is used as comprehensive term referring to those aspect of the 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 the sectors of economic and social life". Because of the significance of Technical and Vocational Education (TVE) in manpower development, attentions have been drawn from various countries around the world on the essence of studying TVE. This quality equally qualifies TVE to be seen as the only attracting programme that tackles the peril of poverty and creates employability skills.

For any country to become economically flourishing in this 21<sup>st</sup> century requires the possession of TVE skills to function. The TVE graduates needs exposure in practical industrial work experience in order to be proficient in their chosen career and be useful to themselves and the society. Practical Industrial Work Experience which is a planned effort undertaken by TVE graduate(s), institutions or agencies to develop the required competencies in people can easily be addressed through vocational options. Competencies of individual's practical skill in TVE are designed to lead the beneficiaries' to self-employment, economic self-sufficiency, and employment generation through short or long-term training. This has lead African countries including Nigeria to realize that training in TVE is necessary to alleviate poverty through skill acquisition. TVE can be described as any form of education whose primary purpose is to prepare beneficiaries for gainful employment in an occupation or group of occupations. TVE is training or retraining programme given in schools or classes under supervision and control. The learning experiences according to Abubakar (2010) may occur in variety of learning context, including educational institutions and workplace.

In Nigeria, the teaching of skills in the formal sector exists in two types of institutions (Oziegbe, 2009). These institutions are Technical Colleges and Trade Centres. In these institutions, individuals are provided with needed skills that will enable them become proficient in both the public workplace and private employment. TVE is a continue process of adaptation of the worker's training towards acquiring the minimum knowledge required. Technical Vocational Education is result oriented. It brings about technological advancement and aims to fit new manpower for employment and provide continuing training for those already qualified, so that they can keep pace with modern and emerging work environment. TVE are by design intended to develop skills that can be used in specific occupation or job (Maigida, 2012). The objectives and content of the curricula of TVE according to the World Bank are derived from occupational standards or more directly from analysis of the task that are to be carried out on the job. The effectiveness of these curricula can thus be measured by the extent to which trained beneficiaries can use their skills in employment. The National Policy on Education (2013) explained the purpose of TVE as:

- (i) To enable individuals acquire vocational and technical skills.
- (ii) To expose the individuals to career awareness by exposing useable options in the world of work.
- (iii) To enable youth acquire an intelligent understanding of the increasing complexity of technology,
- (iv) To stimulate creativity.

The NPE highlight the Nigeria's desired to achieve national goal through quality education, hence the need for acquisition of appropriate skills and competence both mental and physical as equipment for the individual to life and to also contribute to growth of the society. Thus, no society can develop to appreciable level without relevant functional and technological based TVE programme. In Nigeria, the need for TVE cannot be overstressed. Hence, Maigida, (2012) opined that Technical Vocational Education should be included in the curriculum programme of all school beginning from the time a child enters the primary school till his/her graduation from the university. This would help develop sufficient skills in their chosen occupational skills so as to help them obtain and hold employment on graduation. It's imperative for Post-secondary Technical Vocational Colleges of Technology, Polytechnics and Universities to make provisions that would ensure that students who offer TVE courses in secondary schools are given the opportunity to increase their level of skill through further training. TVE provides various opportunities for discovering and developing the individual's potentials for work. Accordingly, Oziegbe (2009) opined that TVE has a broadening effect, which motivates learners to be more exploratory, realize their capability and develop their potentials for success in the workplace. In TVE, the youth undoubted would have the opportunity of being productive and become useful to themselves and the society.

Technical Colleges are post primary institutions where students are giving full vocational training that

will enable them acquire relevant knowledge, skills and attitude for paid or self-employment in various occupations in the world of work. Technical Colleges in the opinion of Okoro (2006) are major vocational establishment in Nigeria which is premeditated to set up an individual into acquiring practical skills, knowledge and attitude indispensable for craftsmen and technicians at sub-professional level. Technical colleges admit Junior Secondary School leavers and provide them with a full vocational course of three years. However, National Board for Technical Education (NBTE 2011) reported that the quality of academic programmes in technical colleges is regulated by its body of curriculum development, supervision and periodic accreditation visits while the National Business and Technical Examinations Board (NABTEB) is responsible for the examination and certification of the occupational trades leading to the award of National Technical Certificate (NTC) and Advanced National Technical Certificate (ANTC). The trades offered in the Technical Colleges in Nigeria according to FGN (2013) include: Building Trades; Beauty Culture Trades; Computer Craft Practice; Electrical Engineering Trades; Wood Trades; Printing Trades; Textile Trades; Hospitality trades, agricultural implements and equipment, auto electrical work, auto-body repair and spray painting, part-machining, mechanical engineering craft practice, welding and fabrication, instrument mechanics work, radio television and electrical work, air conditioning and refrigeration, foundry craft practice, block laying, bricklaying and concrete work, painting and decorating, plumbing and pipe fitting, carpentry and joinery, furniture making and upholstery, automobile engineering practice, mechanical trades and electrical installation and maintenance work.

Electrical/Electronics trade is one of the vocational trade training offered in Technical Colleges in Nigeria and classification of the trade in Technical Colleges according to NBTE (2012) includes: Appliance maintenance and repairs, Electrical installation and maintenance works, Instrument mechanics, and Radio, television (RTV) and maintenance works. The aim of Electrical/Electronics according to NBTE is to give training and impart the necessary skills leading to the production of craftsmen, master craftsmen and other skilled personnel who will be enterprising and self-reliant towards sustainable development. Ede, Miller and Bakare (2010) identified that students studying technical education programmes are trained in auto-mechanics, wood-work, plumbing, computer craft, mechanical trades, radio, television (RTV) and electronics works, electrical installation and maintenance works. With center of attention on electrical/electronic (E/E) trade; Electrical/electronics trade is vital in the production of workforce with understanding in diverse skills in the design, development, production, management and utilization of trending electrical/electronics devices and circuits, as well as imparting basic knowledge and skills leading to the production of skilled craftsmen who will be enterprising, self-reliant and sufficiently competent to meet the demands in the world of work. According to Republic of South Africa (2008), electrical/electronic trade focuses on the application and understanding of principles and technological process inherent in the application/production of electrical/electronic products and system in order to improve the quality of life. In view of the National Board for Technical Education programme (NBTE, 2012) electrical/electronics offers trade in; Appliance maintenance and repairs, Electrical installation and maintenance works, Instrument mechanics, and Radio, television (RTV) and maintenance works.

Electrical installation and maintenance works as offered in technical colleges prepares an individual with job-satisfying requirements towards employment and self-reliance. Electrical installation and maintenance work provides technical training to meet the demands of electrical industry and the needs of the individual allowing the students to identify their career objectives (Ogwa 2015). Skill is the ability to do something well, usually gained through training or experience. Skills in electrical installation and maintenance works employs measures and develops jobs in electrical installation geared towards making students confident and self-reliant (Ngwoke, 2006). Electrical installation and maintenance works curriculum is designed to prepare the students to acquire entry level knowledge and manipulative skills for employment in the electrical industry in Rivers State, Nigeria. Students who undergo training in electrical installation and maintenance trades as expected to get hold of skills for fineness in installation of electrical machines and equipment, maintain nerve of machines and equipment, winding of electrical machines, testing and inspection of electrical installations, repair of electrical machine and others.

However, sustainable development allows every human being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future. Sustainable Development means including key issues into teaching and learning; for example, climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption. It also requires participatory teaching and learning methods that motivate and empower learners to change their behaviour and take action towards sustainability. Sustainable Development consequently promotes competencies like critical thinking, imagining future scenarios and making decisions in a collaborative way. (UNESCO, 2011). According to Kates, Thomas and Anthony (2005), Sustainable development is defined as a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Davies, (2013) defines sustainable development as target-oriented, long-term (continuous), comprehensive and synergetic process with impacts on all aspects of life (economic, social, environmental and institutional) at all levels.

### **Statement of the Problem**

Electrical installation and maintenance works skills learned in technical colleges are perched with potentials of equipping the students with required skills to propel them throw in meaningfully to national economic development, be self-reliant, creates job for sustainability and reduce unemployment. Nevertheless, most electrical installation and maintenance works graduates roam the street unemployed because they cannot get employed or establish their own workshop due to the fact that they lack marketable skills which may be as a result of ill training or inadequate skill acquisition amongst graduates of electrical installation and maintenance work. Hence there is need for identification and integration of relevant skills needed in electrical installation and maintenance works into technical college curriculum for job creation, self- reliance and sustainability in Rivers State.

### **Purpose of the Study**

The purpose of the study is to ascertain the required electrical installation and maintenance work skills for sustainability by graduates of Government Technical Colleges in Rivers State. Specifically, the Study sought to:

- i. Industrial Installation and Electric Motors skills required for sustainability by graduates of Government Technical Colleges in Rivers State.
- ii. Winding of Electrical Machines skills required for sustainability by graduates of Government Technical Colleges in Rivers State.

### **Research Questions**

The following research questions guided the Study:

1. What are the industrial Installation and Electric Motors skills required for sustainability by graduates of Government Technical Colleges in Rivers State?
2. What are the winding of Electrical Machines skills required for sustainability by graduates of Government Technical Colleges in Rivers State?

### **Hypotheses**

The following null hypotheses were formulated and tested at .05 alpha level of significance guided the study:

- Ho<sub>1</sub>: There is no significant difference in the mean ratings of teachers and students (Electrical) on industrial Installation and Electric Motors skills required for sustainability by graduates of Government Technical Colleges in Rivers State
- Ho<sub>2</sub>: There is no significant difference in the mean ratings of teachers and students (Electrical) on winding of Electrical Machines skills required for sustainability by graduates of Government Technical Colleges in Rivers State

## **METHODOLOGY**

This section is properly separated into the following sub-heading as to make it coherent and very explicit:

### **Research Design**

The study adopted descriptive survey research design; because it was considered suitable for this study as it elicited information from the respondents as well as assessment of public opinion using a structured questionnaire and sampling methods (Alio, 2008).

### **Population and Location of Study Area**

The study area was Rivers State, Nigeria. The population of the study comprised 25 graduates of electrical/electronics in rural areas, 60 graduates of electrical/electronics in urban areas and 15 technical college teachers sampled purposively. The entire population was used as the population size was manageable.

### **Research Instrument**

The instrument used for data collection was a 20-item structured questionnaire titled “Electrical Installation and Maintenance Trades Skills Questionnaire (EIMTSQ)”, designed in the pattern of a 4-point modified rating scale developed by the researcher. The responses were Highly Required (HR), Required (R), Moderately Required (MR), and Lowly Required (LR) having numerical values of 4, 3, 2 and 1 respectively.

### **Methods of Data Collection**

A total of 100 copies of the instrument administered to the respondents were duly completed and used for the analysis. This was made possible with the help of five (5) research assistants in the rural areas, urban areas and GTCs in Rivers State.

### **Validation/Reliability of the Instrument**

The EIMTSQ was validated (face and content) by three experts; one from the Department of Industrial Technical Education, Rivers State University, another one from the Department of Tests and Measurement, Ignatius Ajuru University of Education, and the last one from the Department of Electrical Engineering, University of Port Harcourt, all in Port Harcourt, Rivers State. The reliability of the instrument was determined by a pre-test on 15 respondents (5 each from the various categories) who were not part of the population or the sample. A reliability coefficient index of .89 was established through Cronbach Alpha Reliability Coefficient formula.

### **Data Analysis**

The data obtained from the questionnaire were analyzed using mean and standard deviation to answer the research questions while the hypotheses were analyzed using Analysis of Variance (ANOVA) at .05 alpha level of significance. The computation of the mean and ANOVA were carried out with Statistical Package for Social Sciences (SPSS). For the research questions, real limit of numbers was applied thus; it was decided that an item with a calculated mean value equal or greater than 2.50 (2.50 – 4.00) was rated highly required while item with the calculated mean less than 2.50 (0 – 2.49) was rated lowly required. Standard deviation value close or wide apart was used to determine the homogeneity/heterogeneity in opinion among the respondents. If the calculated F-ratio (F-cal) is equal or less than the critical value of F (F-crit), the hypothesis was not rejected otherwise, not accepted.

**RESULTS**

The results of the analysis of the study are presented in tables below according to the research questions and hypotheses.

**Research Question 1:** *What are the electrical installation skills for sustainability required by E/E graduates of GTCs in Rivers State?*

**Table 1: Mean and Standard Deviation of Respondents on Electrical Installation Skills for Sustainability required by E/E Graduates of GTCs in Rivers State**

| S/N                                      | Items   | Rural Graduates |              |     | Urban graduates |              |     | GTCs Teachers |              |     |
|--|---|-----------------|--------------|-----|-----------------|--------------|-----|---------------|--------------|-----|
|  |   | $\bar{x}$       | SD           | RMK | $\bar{x}$       | SD           | RMK | $\bar{x}$     | SD           | RMK |
| 1  | Plan the layout and Installation of wiring    | 4.00            | .000         | HR  | 3.5             | .651         | HR  | 4.00          | .000         | HR  |
| 2  | Competence with tools                         | 3.83            | .381         | HR  | 3.47            | .700         | HR  | 3.67          | .488         | HR  |
| 3  | Effectives use of materials                   | 3.21            | .415         | HR  | 3.40            | .785         | HR  | 3.07          | .258         | HR  |
| 4  | Inspection of electrical installation         | 3.83            | .381         | HR  | 3.43            | .621         | HR  | 2.73          | .594         | R   |
| 5  | Interpretation of wiring drawing              | 3.63            | .495         | HR  | 3.55            | .502         | HR  | 3.73          | .458         | HR  |
| 6  | Measuring and marking out                     | 3.42            | .504         | HR  | 3.38            | .691         | HR  | 3.13          | .352         | HR  |
| 7  | Testing of electrical installation            | 3.63            | .495         | HR  | 3.43            | .621         | HR  | 3.48          | .595         | HR  |
| 8  | Correct functioning of electrical circulatory | 4.00            | .000         | HR  | 3.53            | .596         | HR  | 3.20          | .561         | HR  |
| 9  | Compliance with statutory/safety regulation   | 3.63            | .495         | HR  | 3.37            | .758         | HR  | 3.33          | .488         | HR  |
| 10                                       | Interpretation of installation details        | 3.63            | .495         | HR  | 3.48            | .651         | HR  | 3.67          | .488         | HR  |
| <b>Grand Mean (<math>\bar{X}</math>)</b> |   | <b>3.679</b>    | <b>.3050</b> |     | <b>3.438</b>    | <b>.5387</b> |     | <b>3.400</b>  | <b>.2420</b> |     |

Source: field survey 2019.

Mean ( $\bar{X}$ ) = 2.50

The analysis of data in Table 1 above shows that respondents agreed to the items indicating that electrical installation skills for sustainability required by E/E graduants of GTCs in Rivers State gives them the opportunity to practice what they have been taught in class, improves their skills, gives room for efficiency and proficiency development in their various occupational choices especially in electrical

installation works as their grand means are 3.679, 3.438 and 3.404 respectively for rural graduants, urban graduants and GTCs teachers, which falls within the range of accepted decision rule (2.5 – 4.00).

**Research Question 2:** *What are the maintenance work skills for sustainability required by E/E graduates of GTCs in Rivers State?*

**Table 2: Mean and Standard Deviation of Respondents on Maintenance Work Skills for Sustainability required by E/E Graduates of GTCs in Rivers State**

| S/N                                      | Items  | Rural Graduates |              |     | Urban graduates |              |     | GTCs Teachers |              |     |
|--|--|-----------------|--------------|-----|-----------------|--------------|-----|---------------|--------------|-----|
|  |  | $\bar{x}$       | SD           | RMK | $\bar{x}$       | SD           | RMK | $\bar{x}$     | SD           | RMK |
| 1  | Forecasting of spare parts   | 3.63            | .495         | HR  | 3.47            | .503         | HR  | 3.60          | .507         | HR  |
| 2  | Estimation of maintenance costs                                    | 4.00            | .000         | HR  | 3.23            | .647         | HR  | 4.00          | .000         | HR  |
| 3  | Evaluation of alternatives   | 4.00            | .000         | HR  | 2.92            | .671         | R   | 2.73          | .458         | R   |
| 4  | Assessing required maintenance tools                               | 3.71            | .464         | HR  | 2.95            | .699         | R   | 3.13          | .640         | HR  |
| 5  | Reporting safety hazards associated with maintenances of equipment | 3.83            | .381         | HR  | 3.02            | .676         | HR  | 3.67          | .488         | HR  |
| 6  | Practice safe working methods of electrical systems                | 4.00            | .000         | HR  | 3.15            | .659         | HR  | 3.07          | .458         | HR  |
| 7  | Use electrical test equipment effectively                          | 3.63            | .495         | HR  | 3.17            | .557         | HR  | 3.20          | .561         | HR  |
| 8  | Identify motor and power circuit faults                            | 3.42            | .504         | HR  | 3.12            | .761         | HR  | 3.27          | .458         | HR  |
| 9  | Use circuit diagram as an aid to maintenance                       | 3.63            | .495         | HR  | 3.15            | .709         | HR  | 3.53          | .516         | HR  |
| 10                                       | Understand the basic regulatory requirements                       | 4.00            | .000         | HR  | 3.32            | .567         | HR  | 3.20          | .414         | HR  |
| <b>Grand Mean (<math>\bar{X}</math>)</b> |  | <b>3.783</b>    | <b>.2496</b> |     | <b>3.148</b>    | <b>.4386</b> |     | <b>3.340</b>  | <b>.2772</b> |     |

Source: field survey 2019.

Mean ( $\bar{X}$ ) = 2.50

The analysis of data in Table 2 above shows that respondents accepted the statements in the items proving that maintenance work skills required by E/E graduants of GTCs in Rivers State brings about sustainability, however, opportunities to practice and improves their skills for efficiency and proficiency development in their various choice of trades were some challenges for the rural graduants as their grand means are 3.783, 3.148 and 3.340 respectively for rural graduants, urban graduants and GTCs teachers, which falls within the range of accepted decision rule (2.5 – 4.00).

**Testing of Hypotheses**

**Ho1:** There is no significant difference in the mean ratings of the respondents on electrical installation skills for sustainability by E/E graduates of GTCs in Rivers State

**Table 3: One-way Analysis of Variance (ANOVA) summary on electrical installation skills for sustainability by E/E graduates of GTCs in Rivers State**

| Sources of Variance | Sum of Squares | df | Mean Square | F-cal | $\alpha$ | F-crit | Sig. |
|---------------------|----------------|----|-------------|-------|----------|--------|------|
| Between Groups      | 1.140          | 2  | .570        | 2.726 | .05      | 3.09   | .071 |
| Within Groups       | 20.081         | 96 | .209        |       |          |        |      |
| Total               | 21.222         | 98 |             |       |          |        |      |

The ANOVA summary in Table 3 has shown that for between groups, the sum of squares is 1.140 with 2 degree of freedom and .570 mean squares. Within groups has 20.081 sum of squares, 96 degree of freedom and .209 mean squares. The total group sum of squares is 21.222 with 148 degree of freedom. The calculated F value is 2.726.

Decision rule: The F-critical value at 2 degree of freedom from column and 96 degree of freedom from the row for  $\alpha$  .05 is 3.09. The calculated F-ratio (2.726) is less than the critical value of F (3.09) at .05 alpha level of significance. Thus, the null hypothesis of no significant difference was not rejected which indicate that electrical installation skills required by E/E graduates of GTCs in Rivers State can influence sustainability.

**Ho2:** There is no significant difference in the mean ratings of the respondents on maintenance work skills for sustainability by E/E graduates of GTCs in Rivers State

**Table 4: One-way Analysis of Variance (ANOVA) summary on maintenance work skills for sustainability by E/E graduates of GTCs in Rivers State**

| Sources of Variance | Sum of Squares | df | Mean Square | F-cal  | $\alpha$ | F-crit | Sig. |
|---------------------|----------------|----|-------------|--------|----------|--------|------|
| Between Groups      | 6.914          | 2  | 3.457       | 23.945 | .05      | 3.09   | .000 |
| Within Groups       | 13.859         | 96 | .144        |        |          |        |      |
| Total               | 20.773         | 98 |             |        |          |        |      |

The ANOVA summary in Table 4 has shown that for between groups, the sum of squares is 6.914 with 2 degree of freedom and 3.457 mean squares. Within groups has 13.859 sum of squares, 96 degree of freedom and .144 mean squares. The total group sum of squares is 20.773 with 98 degree of freedom. The calculated F value is 23.945

**Decision rule:** The F-critical value at 2 degree of freedom from column and 96 degree of freedom from the row for  $\alpha$  .05 is 3.09. The calculated F-ratio (23.945) is greater than the critical value of F (3.09) at .05 alpha level of significance. Thus, the null hypothesis of no significant difference was not accepted. Therefore, there is a significant difference in the respondent’s opinion on maintenance work skills for sustainability by E/E graduates of GTCs in Rivers State. This however, indicates that maintenance work skills by E/E graduates of GTCs in Rivers State cannot influence sustainable development.

## **DISCUSSION OF THE FINDINGS**

The study as presented in research question 1 (Table 1) above, revealed that electrical installation work skills such as ability to plan the layout and installation of wiring; Test electrical work for safety; Effectives use of materials; Interpretation of wiring Measuring and marking out, competence with tools; Inspection of electrical installation; Verification of electrical installation, and Correct functioning of electrical circulatory were highly required for job creation, self reliance and sustainability. The ANOVA results (F-cal at 2.726) is less than (F-crit at 3.09) at F- 98 degree of freedom, show that there is no significant difference in the mean ratings of technical college graduates in rural, urban cities and GTCs teachers on electrical installation work skills for job creation, self reliance and sustainability in Rivers State. This is in concurrence with the findings of Akinduro (2006) who opined that electrical installation and maintenance work skills is needed by technical college graduates for the enhancement employability and sustainability.

Findings in Table 2 showed that maintenance skills akin to forecasting of spare parts, analysis of repetitive drawing, equipment failure, assessing needs for equipment replacements, application of scheduling principles to replacement programme, application of project management principles, ability to assume optimization of the maintenance organization structure, evaluation of alternatives, assessing required maintenance tools, practice safe working methods of electrical systems, use electrical test equipment effectively and ability to identify motor and power circuit faults are highly required. Supporting this, Bakare (2006) reported that electrical maintenance work and safety practice skills are required for job creation, self-reliance and sustainability by E/E graduants of technical colleges for effective functioning in and outside the workshops. It was however established that opportunities to practice and improves electrical installation and maintenance work skills for efficiency and proficiency development in various choice of trades were some challenges for the rural graduants of electrical/electronics in Rivers State.

## **CONCLUSION**

Based on the findings of the study, electrical installation and maintenance work skills is a requirement in the training of students of E/E for job creation, self-reliance and sustainability. Both technical college graduates in rural communities, urban cities and GTCs teachers agreed to the facts that electrical installation and maintenance work skills are required if job must be created, and graduates becoming self dependent/reliance. Installation work such as Planning the layout and installation of wiring, testing of electrical work for safety, competence with tools, effective use of materials, inspection of electrical installations, interpretation of wiring drawing, electrical maintenance skills like diagnosing basic faults and recognize the associated signs, use electrical test equipment effectively, understand the basic regulatory requirements in maintenance, use circuit diagram as an aid to maintenance, reporting safety hazards associated with maintenances of equipment and application of scheduling principles to replacement programme are greatly required for job creation and sustainability. It is believed that when these skills are taught, it would facilitate job creation, self reliance and sustainability in Rivers State.

## **RECOMMENDATION**

The following recommendations were made in view of the findings of the study:

1. Electrical installation and maintenance work skills should be encouraged by GTCs teachers for job creation, self reliance and sustainability of technical college graduates in Rivers State.
2. All identified skills should be integrated into the curriculum of technical colleges by curriculum planners for training of E/E students.
3. Government should endeavour to finance and equip technical college workshops as to encourage more training and equipment of students with necessary skills for job creation and self-reliance and sustainability upon graduation.

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