SKILL NEEDS OF GRADUATES OF TECHNICAL COLLEGES IN ELECTRICAL INSTALLATION AND MAINTENANCE PRACTICE FOR EMPLOYMENT IN RIVERS STATE.

BY

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Abstract

This study was conducted with the objective of identifying the skill needs of Technical College graduate for employment in Rivers State. To achieve this objective, three research questions were posed to guide the study. The research questions were answered using mean with standard deviation. A survey research design was used for the study. The population for the study consisted of 60 graduates of Electrical Installation and Maintenance Practice from Technical Colleges working in industries in Rivers State. A 30 items questionnaire was the instrument used for data collection. The instrument was face validated by two experts from School of Education, Federal College of Education (Tech), Omoku, Rivers State and an expert from Department of Technology and Vocational Education (TVE), Enugu State University of Science and Technology (ESUT) Enugu. With the reliability of the instrument was determined using Cronbach Alpha and reliability index was calculated to be 0.88. The study revealed that graduates of technical colleges needed skills to carry out repair, mantling and dismantling of electrical machine, winding of electrical machine etc. Consequently, some recommendations were proffered, some of which included that electrical machines/equipment should be made available in technical colleges where the students will be exposed to the function and operation and that electrical teacher should be allowed to go for refresher course/workshop in the electrical industry where they would be exposed to modern machines as to impart their experiences to the students.

Introduction

The school system has among its responsibilities charged with the provision of training programme which will help to meet the human resource needs of the nation. The training programmes are aimed at equipping the youths with useful skills and knowledge in their desired area of study. One of such school programmes where the youths are provided with the opportunity to acquire the skills and knowledge for effective nation building is the technical programme, offered in technical colleges.

Technical colleges provide the students with a programme in vocational area for a period of three years. Technical colleges train students in auto-mechanic, plumbing, carpentry and joinery, cabinet making, painting and decorating,

welding and fabrication, electricity and electronics trades source?? The trades provide the youths with practical skills.

At the end of the approved period of study student take various examinations, particularly National Business and Technical Examination Board (NABTEB) examination, the National Technical Certificate (NTC) examination and the Senior School Certificate Examination (SSCE). On completion of the course they also seek for work in industries or try to establish business on their own, or they also seek for admission for further studies for those who want to further their education immediately.

According to Akpan (2003), technical colleges are designed to prepare individuals to acquire practical skills, basic scientific knowledge and attitude required as craftsmen and technician at sub-professional levels. Okoro (2006) indicated that technical colleges are regarded as principal vocational institutions in Nigeria that give full vocational training intended to prepare students for entry into various occupations as operative artisans craftsmen and technicians.

Electrical installation and maintenance practice is one of the recognized trades in technical education. It is one of the trades offered in technical colleges and a vocational trade that exposes students to practical skills. According to Wikipedia (2012), electrical installation and maintenance practice is a programme introduced by way of practical exercise, the maintenance of electrical system and circuits, electrical installation, inspection and testing procedure. The National Board for Technical Education NBTE (2004) pointed out that electrical craftsmen are expected to test, diagnose, service, install and completely repair any fault on electrical ,machine and equipment using the manufacturing manual.

Improvement in the other hand, is the process of making something better than before. Improvement according to Amusa (2009), is the ability or condition for becoming better than before. Improvement in this study is a process of helping students of Technical Colleges in Rivers to acquire skills in electrical installation and maintenance practice for greater efficiency.

Employment, according to Wikipedia (2012), means working for one's self or an employer. To be employed, an individual needs to be highly skilled in a trade. Specifically, students from technical colleges are expected to acquire the sellable skills needed for employment in the electrical industry or for self employment after graduation. However, the present situation of unemployment in this country among Technical College students is an indication that the national objectives of the self-ehance has not been achieved. It is a well known that effective training in skills acquisition has contributed to the technological excellence and economic self- reliance of the industrialized nations. Osuala (2004) defined skill as the ability to perform expertly, facilitate performance during employment. Skill according to Michael (2004) is an individual capability to control elements of behaviour, thinking and feeling within specified context and within particular task domains.

Advances in technology have rendered electrical skills in adequate for work in electrical industry, while creating needs for new and often sophisticated skills. This is because

electrical products are coming with new devices as a result of technological advancements. With the seemingly rapid growth in electrical users in Nigeria today, there is need to improve skills of the work force needed for electrical industry. This study therefore, identified electrical skill areas where students were deficient and needed improvement. This is with a view to sustaining the pace of development in electrical industry in Nigeria for sustainable development.

Purpose of the Study.

The purpose of the study was to determine the work skill improvement needs of graduates of Technical Colleges in Electrical Installation and Maintenance Practice for employment in industries in River State. Specifically the study sought to determine.

1. Work skill improvement needs of graduates in installation of electrical machine and equipment.
2. Work skill improvement needs of graduates in maintenance of electrical machine and equipment
3. Work skill improvement needs of graduates in winding of electrical machines.

Research Questions

The following research questions guided the study.

1. What are the work skill improvement needs of graduates in installation of electrical machines and equipment in technical colleges in River state?
2. What are the work skill improvement needs of graduates in maintenance of electrical machines and equipment in technical colleges in River state?
3. What are the work skill improvement needs of graduates in winding of electrical machines in technical colleges in River state?

Methodology

The design of the study was a survey. Alio (2008) defined a survey research 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 representative of the entire group or by collecting and analyzing data from the entire people or items. This design was suitable for this study because the study collected data from a population of graduates of electrical installation and maintenance practice from Technical Colleges working in industries in Rivers State. The population for the study consisted of 60 graduates of Electrical Installation and Maintenance Practice from Technical Colleges working in industries in Rivers State. There was no sampling because of the relative small size of the population.

The instrument for data collection was a questionnaire. The questionnaire consisted of 30 items structured in a four-point rating scale of strongly needed, needed, slightly needed and not needed with weighted value of 4,3,2, and 1 respectively. All the 60 copies of the questionnaire distributed were correctly completed and returned. Thus, giving 100 percent return rate. Face and content validation of the questionnaire were done by two expert from School of Technical Education, Federal College of Education (Tech), Omoku, Rivers State and an expert from the Department of Technology and Vocational Education (TVE), Enugu State University of Science and Technology (ESUT) Enugu State. They made suggestions that helped

in modifying the instrument used for the study. The reliability of the instrument for data collection was determined using Cronbach Alpha. This formula was deemed suitable for testing the internal consistency of the test items because of the nature of the instrument itself. In determining the reliability of the instrument, the questionnaire was administered to 20 graduates of electrical installation and maintenance practice from Federal Government Science and Technical College (FGSTC) Tungbo, Bayelsa State. The data collected from respondents to the instrument were analyzed using the Cronbach Alpha reliability coefficient and it yielded 0.88 thus, indicating that the instrument was reliable and suitable for use for this study.

Mean with standard deviation was used to answer the three research questions that guided the study. Results were presented in Tables 1-3. The decision rule was that items with mean value of 2.50 and above were regarded as needed while those with mean values below 2.50 were indicated as not needed.

Results

Result of the data analyzed for this study were presented according to research questions and contained in tables1-3

Research Question 1

What are the work skill improvement needs of graduates in installation of electrical machines and equipment?

Table 1. Mean ratings with standard deviation on work skills improvement needs of graduates in installation of electrical machines and equipment.

S/N	Item Statement	N=60 $\bar{X}$	SD	Decision
1	Knowledge of IEE regulation for the installation of electrical machine.	2.80	0.29	Needed
2	Accurate sketches and drawing of the electri cal circuit for installation.	2.60	0.28	Needed
3	Appropriate electrical component to be used for the installation.	3.00	0.32	Needed
4	Appropriate tools and equipment for installation of the electri.cal machine.	2.60	0.28	Needed
5	Ability to mount the electrical machine at the required point.	2.90	0.31	Needed
6	Connecting wires correctly.	2.70	0.29	Needed
7	Using suitable earthing system to prevent electric shock	2.60	0.28	Needed
8	Connecting suitable protective devices such as fuse and circuit breakers.	2.70	0.28	Needed
9	Assembling parts of machine correctly.	2.60	0.29	Needed
10	Carring out relevant tests such as continuity test earth leakage test before installation is energized	2.50	0.28	Needed
	Grand Mean	**2.84**	**0.30**	Needed

In response to research question 1, table 1 revealed that all respondents agreed with the items. It shows that graduates of electrical Installation and maintenance practice in Technical Colleges required skill in installation of electrical machine and equipment. The grand mean score is 2.84 and the grand standard deviation score is 0.30. Appropriate electrical component to be use for installation has the highest mean score of 3.10 while how to carry out relevant test such as continuity test, earth leakage test before installation has the lowest mean score of 2.50. The low standard deviation shows that the responses are close.

Research Question 2

What are the skill improvement needs of graduates in maintenance of electrical machines and equipment?

Table 2: Mean ratings and standard deviation on the work skills improvement needs of graduates in maintenance of electrical machines and equipment.

S/N	Items Statement	N=60 $\bar{X}$	SD	Decision
11	Ability to locate faults in the electrical machine using appropriate tools and equipment.	3.10	0.32	Needed
12	Removing faulty units from the machine for services.	2.70	0.29	Needed
13	The u se of appropriate tools and equipment for a particular operation on the electrical machine.	3.30	0.35	Needed
14	Dismantling fault unit correctly	2.80	0.29	Needed
15	Identifying the bad component	270	0.29	Needed
16	Carrying out preventive and corrective maintenance correctly.	2.60	0.28	Needed
17	Inspecting repair and replace the faulty component.	3.00	0.31	Needed
18	Using the correct grade of lubricant to lubricate moving party of the electrical machine.	2.60	0.28	Needed
19	Connecting all wires and protective devices correctly	2.70	0.29	Needed
20	Conducting proper test to ensure that the maintained parts of machine are in good working condition.	3.20	0.34	Needed
	Grand Mean	**2.90**	**0.30**	Needed

Table 2, denoted the analysis of the data for the items. This showed that all items have mean responses above the cut off point. This is an indication that the graduates of technical college need skill improvement in maintenance of electrical machine and equipment. The grand mean score for all the items is 2.90 and the grand standard deviation is 0.30. The low standard deviations meant that all respondents have the same opinion. Item no 12 has the highest mean score of 3.30 while item no 10 has the lowest mean score of 2.60

Research Question 3

What are the work skill improvement needs of graduates in winding of electrical machines?

Table 3: Mean rating and standard deviation on work skills improvement needs of graduates in winding of electrical machines.

S/N	Items Statement	N=60 $\bar{X}$	SD	Decision
21	Selecting appropriate tools and equipment for rewinding electrical machine.	2.70	0.29	Needed
22	Dismantling the machine and identify the front and the back shield	2.60	0.28	Needed
23	Carefully observing and developing the rewinding diagram of the electric machine.	3.20	0.34	Needed
24	Removing the burnt coil from the machine and count the coils per slot properly.	3.10	0.32	Needed
25	Performing proper insulation of the slots using suitable insulation.	2.60	0.28	Needed
26	Replacing the windings using the required wire gauge of wires.	2.50	0.28	Needed
27	Using proper varnish on the wound coil.	2.50	0.28	Needed
28	Checking brush position	2.80	0.29	Needed
29	Testing the rewound electrical machine for performance	2.70	0.29	Needed
30	Assembling the parts of the machine properly.	3.00	0.31	Needed
	Grand Mean	**2.70**	**0.29**	Needed

In responses to research questions 3, Table 3, showed that all the respondents agreed with the items on work skill needs of graduate of technical College in winding of electrical machine. Item no 23 attracted the highest mean score of 3.20 and standard deviation of 0.34. The grand mean score is 2.70 and standard deviation is 0.29. The low standard deviation shows that the respondents have consensus opinion.

Findings

1. **Graduates in installation of electrical machines and equipment require skill improvement in the following area:**
   - i Knowledge of IEE regulation for the installation of electrical machine.
   - ii. Accurate sketches and drawing of the electrical circuit for installation.
   - iii. Appropriate electrical component to be used for the installation.
   - iv. Appropriate tools and equipment for installation of the electrical machine.
   - v Ability to mount the electrical machine at the required point.
   - vi. Connecting wires correctly.
   - vii. Suitable earthing system to prevent electric shock
   - viii. Connecting suitable protective devices such as fuse and circuit breakers.
   - ix. Assembling parts of machine correctly.
   - x. Carrying out relevant tests such as continuity test earth leakage test before installation is energized

2. **Maintenance of electrical machines and equipment, the graduates requires skills improvement in the following area:**
   - i. Ability to locate faults in the electrical machine using appropriate tools and equipments.
   - ii. Removing faulty units from the machine for services
   - iii. The use of appropriate tools and equipment for a particular operation on the electrical machine.
   - iv. Dismantling fault unit correctly
   - v. Identifying the bad component
   - vi. Carrying out preventive and corrective maintenance correctly
   - vii. Inspecting repair and replace the faulty component
   - viii. Using the correct grade of lubricant to lubricate moving parts of the electrical machine
   - ix. Connecting all wires and protective devices correctly
   - x. Conducting proper test to ensure that the maintenance parts of machine are in good working condition.

3. **Graduates in the winding of electrical machine require skills improvement in the following area:**
   - i. Selecting appropriate tools and equipment for rewinding electrical machine.
   - ii. Dismantling the machine and identify the front and the back shield
   - iii. Carefully observing and developing the rewinding diagram of the electric machine.
   - iv. Removing the burnt coil from the machine and count the coils per slot properly
   - v. Performing proper insulation of the slots using suitable insulation.

vi. Replacing the windings using the required wire gauge of wires.
vii. Using proper varnish on the wound coil.
viii. Checking brush position
ix. Testing the rewound electrical machine for performance

Assembling the parts of the machine properly.

Discussion of Results

The result of this study revealed that improvement were needed in the following skill areas in the installation of electrical machine and equipment, maintenance of electrical machines and equipment and winding of electrical machines in Technical Colleges in Rivers State. These findings are in conformity with the findings of Akinduro (2006),who found out that graduates of technical colleges needed work skills improvement in domestic and industrial installation, cable joining etc. after graduation. The findings were also in consonance with the findings of Sowande (2002) who found out that Metal Work Teachers needed improvement in eighty (80) competency items for better performance on the field. The findings were also related to the findings of Bakare (2006), who found out that the technical college students of Electrical-Electronics needed Safety Practice Skills in using hand tools, operational power tools etc. the findings of the authors cited above help to validate the results of this study.

Conclusion

On the basis of the findings it was concluded that graduates of technical colleges in electrical installation and maintenance practice were deficient in skills and needed skills improvement for employment in electrical industry

The inability of the graduates to put the knowledge obtained from the school into practical use in actual job situation was as a result of not having the necessary skills required for actual work. This posed a challenge both to government and the teachers involved in the training. Steps should be taken to reverse this ugly situation in order to prepare Technical College graduates adequately for employment in the electrical industry.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Electrical machines/equipment should be made available in Technical Colleges where the students will be exposed to the function and operation.
2. Electrical teachers should be allowed to go for refresher course/workshop in the electrical industry where they will be exposed to modern machines as to impart their experiences to the students.
3. The Students should undergo six month intensive training on the needed skills to compliment the classroom work before graduation.

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