Assessment of Skills Required by Electrical Installation and Maintenance Practice Student to Graduate with Competent Skills in Technical Colleges in Ekiti State

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ABSTRACT

The study assessed entrepreneurial skills required by Electrical Installation and Maintenance practice student to graduate with competent skills in technical colleges in Ekiti state. To guide the study, two research questions were developed and two hypothesis were formulated to guide the study. A descriptive survey design was adopted for the study. A population of fifty (50) teachers of Electrical Installation and Maintenance practice formed the sample of this study. The instrument used for data collection was a structured questionnaire. Data collected were analyzed using mean, while T-test was used to analyze the hypothesis. The findings revealed that Entrepreneurial skill training is needed by Students in of electrical installation and maintenance practice for competency in Ekiti state technical colleges. Also, practical skills training is required by student of electrical installation and maintenance practice for competency in Ekiti state technical colleges. The study recommended that Electrical installation and maintenance work skills should be encouraged by teachers for job creation and self-reliance of technical college graduates in Ekiti State and all identified skills should be integrated into the curriculum of technical colleges by curriculum planners for training of students.

Keywords: Skills, Technical Education, Assessment, Electrical Installation Technology, Technical Education

INTRODUCTION

Developing countries are facing harsh economic realities resulting from youths unemployment orchestrated by governments and companies downsizing their workforce as developed nations constantly flood the market with their numerous products like G.S.M, machines, electrical accessories etc. Graduates from various levels of educational institutions face, slim chances of getting employed without skills of rare quality imparted to them (Okolie et al, 2020). The optimism of any country yearning for technological advancement and relevance in the present-day world would depend on her attainment in the field of Vocational and Technical Education. Hence, Technical and Vocational Education is a system of education designed to prepare individuals to enter into paid employment and other recognized occupations (Kovalchuk et all, 2022). This scenario is expected to aid developing nations to break the shackles of youth unemployment and giving credence to sustainable economic development.

Vocational education focuses on empowering people with necessary skills or training for them to be able to take job or embark on an occupation according to the training they've undergone. Technical education as a part of vocation education has been a merit in nation building and its importance cannot be under estimated (Ogundele et al, 2014). Indeed, technical education and training lead to acquisition of employable skills. Technical and vocational Education and Training (TVET) is described as the training of individuals for the implementation of technological development (Jamaludin et al, 2023). The contributions of TVET in any country of the world today are enormous, as it plays a very important role in the welfare of communities and nation at large as it provide necessary entrepreneurial skills needed by an individual to be gainfully employed. Thus, bringing into practice TVET as applied engineering.

The programs incorporated in TVET among others include welding and fabrication, woodwork and building technology, mechanical and automobile technology, electrical and electronics technology. TVET serves as means for social, economic and political changes due to its special and unique nature (Tikly & L. P., 2013). The major uniqueness of TVET is that it's a medium of acquiring entrepreneurial skills, self-employment and enhancing creativity.

Electrical installation and maintenance work (EIMW) is a technical vocational education and training course that capacitate the learners with skills in rural electrification, domestic installation, electrical testing and instrumentation, machine maintenance, etc. (Yusuf, 2023). To explain further, the subject as one which inculcates theory and practical skills in electrical machine installation and maintenance, fault detection and repair services on electrical machines and battery charging (Ohanu et al, 2021)

Electrical installation and maintenance practice as offered in technical college prepares an individual with job satisfying requirements towards employment and self- reliance. It's a vocational trade that exposes students to skills such as wiring, installation and electrification. Electrical installation and maintenance practice work provides technical training to meet the demands of electrical industry and the needs of the individual allowing students to identify their career objectives (Ogbuanya & Adebayo, 2024). Electrical installation and maintenance practice is a program introduced by way of physical and practical exercise, the maintenance of electrical systems and circuits, electrical installation, inspection and test procedure.

Electrical installation and maintenance practice trade is vital in the production of workforce with understanding in diverse skills in the design, development, production, management and utilization of trending or modern electrical/electronic devices and circuits as well as their maintenance. The ability of graduates to get employment and perform better following the completion of education is seen as an indicator that such students as graduate with necessary and competent skills (Woya, 2019). The effectiveness of electrical installation and maintenance practice program in technical colleges is the extent to which graduates are able to find jobs, enter into the occupation related to the field of training, earn expected income, and are able to use their skills in the place of work. Trade subjects such as Electrical installation and maintenance are taught in Technical colleges

Technical colleges are secondary institutions where individuals are trained to acquire skills, knowledge and attitudes required for either self or paid employment (Ogunmilade, 2017). Okorie (2001) opines that technical college in Nigeria is established to prepare individuals to acquire practical skills and basics scientific knowledge. Technical colleges are regarded as principal vocational institution in Nigeria. They give full training intended to prepare students for entering into various occupation (Okoro, 2006). Technical college is an institution in Nigeria that offers technology education at secondary school level. In the report of National Board for Technical Education NBTE (2004), the aim of electrical installation and maintenance practice is to give training and impact necessary skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant. Students trained in technical colleges are expected to acquire valuable skills in various areas of specialization in which electrical installation and maintenance practice is a trade.

To be employed or become successful entrepreneur in any of the field areas of teaching education, graduates of electrical installation and maintenance practice needs to acquire certain competences and skills to enable them contribute their bits in the overall development of the country. Hence, graduates of technology programs must possess some degree of financial accounting competence to become successful entrepreneur (Onoh, 2013). Recipient of electrical installation and maintenance practice may found themselves working in the industries as technicians or technologists, in the teaching profession as teachers or become self-employed as entrepreneurs.

An entrepreneur is a person who assumes the responsibility and the risk of a business operation with the expectation of making profit (Anusa, 2010). Also, Nwachukwu (2012) see an entrepreneur as a dreamer and ambitious risk taker who love to make things happen. Anusa and Nwachukwu have the same view about entrepreneurs must possess entrepreneurial competencies to fall back on in order to succeed in the business. Entrepreneurship education seeks to prepare people especially youths to responsible, enterprising individuals who become entrepreneurs or entrepreneurial thinkers and who contribute to economic development and sustainability of their societies or community (Oduma, 2012). The introduction of entrepreneurial Skills training Technical College injects a new spirit in the mindset of the graduate beneficiaries of the entrepreneurial study

(Oduma 2012). This will no doubt help to make the students to become self-reliant or self-employed on graduation. Technology education in its foundation level has Entrepreneurship component. Thus, it is often perceived as education "for and about" business or training in business skills, attitudes and competencies, (Okoro, 2007).

Atsumbe and Igbojionu (2008) described skills as knowledge and proficiency required in the accomplishment of engineering, scientific or any specific task. Therefore, entrepreneurial competencies required by electrical installation and maintenance practice graduates of technical education for self-reliance or self-employment according to the context of the work include managerial, technical / ICT, and Interpersonal competencies. The competency need of graduates of technology education arises as a result of technology changes rising more rapidly all over the world. Technological needs of the industries appear to grow faster than the training and improvement training programs in the institutions.

In addition, technology education students need to acquire the training on methods employed by business in reducing risk such as sound management (Okoli, 2013). Also, the reduction or avoidance of physical hazard, self-insurance and transfer of risk to another individuals or organization through hedging, business insurance and employee insurance skills are needed in training potential entrepreneur to survive in the world of business and development of their state. Oduma (2012) identifies innovative skills as the requisite for entrepreneurship to include introduction of a new products, introduction of a new methods of production, opening of new market, exploring a new source of supply of raw materials and carrying out a new type of organization. The acquisition of these skills will enable the Technology education students to function effectively in an environment of strong market forces and complex technological advancement.

Hence, concerted efforts should be made to train technical graduates (electrical installation and maintenance practice graduates inclusive) to enable them meet up with the current challenges in the world of work. To achieve this fit, teachers of technology should be equipped adequately to become competent educators, especially in the field of entrepreneurship. However, available records showed that most of the teachers are ICT and computer illiterate. Such educators need retraining to facilitate their personal and professional growth. Therefore, Amaewhule & Igbojionu (2008) stated that a good human development training program for entrepreneurs should contain among others the managerial, technical/ ICT, and marketing competencies. Management competencies involve the process of planning, organizing, leading and controlling both human (personnel) and material resources in the enterprise.

It appears that most of the graduates of technical colleges lack the necessary skills and competencies that would enable them become self-reliant (Iroegbu, 2017). The evidence is the high rate of unemployment among the graduates of tertiary institutions, electrical/electronic technology education inclusive. This showed that such graduate lacks relevant skills and competencies for self- employment. Therefore, it is against this backdrop that the researcher set out to determine the skill training required of electrical installation and maintenance practice students to graduate with competent skills from technical colleges in Ekiti state.

Statement of the Problem

Well-articulated skills are needed by graduate of Electrical Installation and Maintenance Practice (EIMP) in technical colleges to perform well, as global technology advancement has led to inevitable use of electricity in various aspect of human endeavor. Students trained in EIMP in technical colleges are expected to acquire adequate skills in domestic, commercial and industrial installation, as well as serving in industries and power generating stations. However, it is observed that the skill acquired by technical college graduates particularly those in EIMP in Ekiti state is grossly inadequate, and far below expectation. This shortcoming may be traced to low level exposure of students to practical skills training, no workshops or laboratories practice or absolute negligence to practical exercise and non-exposure of students to practical's required in the course of training.

It can equally be submitted that there is no link between electrical installation theories and practical interpretation as ought to be. This would have created acute missing link or wide gap to fill. The situation in Ekiti state technical colleges is a replica of all other state technical colleges as they all operate in the same environment. Hence, to

fill the gap, the study is poised to investigate the skill training required for improving the EIMP graduates' performance in Ekiti state technical colleges.

Purpose of the Study

The main purpose of this study is to identify the skills required for electrical installation and maintenance practice student to graduate with competent skill in technical colleges in Ekiti state. Specifically, the study intends to identify:

1. The entrepreneurial skills required of electrical installation and maintenance practice students in Ekiti state technical colleges.

2. The practical skills required of electrical installation and maintenance practice students in technical college students in Ekiti state.

Research Questions

The following research questions were raised to guide the study.

1. What are the entrepreneurial skills required of electrical installation and maintenance practice students in Ekiti state technical colleges?

2. What are the practical skills required of electrical installation and maintenance practice students in technical college students in Ekiti state?

Hypotheses

The following null hypothesis will be tested at 0.05

1. There is no significant difference in the mean responses of male and female teachers on the entrepreneurial skills required of electrical installation and maintenance practice students in Ekiti state technical colleges.

2. There is no significant difference in the mean responses of male and female teachers on the practical skills required of electrical installation and maintenance practice students in technical college students in Ekiti state.

METHODOLOGY

The research design adopted was descriptive survey research design. The population for this study consisted of all fifty electrical installation and Maintenance Practice teachers in Ekiti state technical colleges. The whole population will be used because of its small size for the study. The research instrument used for this study was a self-constructed-questionnaire tagged Skills Required by Electrical Installation and Maintenance Students Questionnaire (SREIMSQ), which was developed by the researchers. The item statements embodied in the questionnaire are related to the purpose and questions raised for the study. It has two sections A and B. Section A contained demographic information of the respondents while section B centered on e-learning for Electrical Installation using likert type scale of Strongly Agree (SA), Agree (A) Strongly Disagree (SD) and Disagree D. To establish the validity of the instrument, the questionnaire was given to three experts in the department of industrial technical education for scrutiny and necessary corrections or modifications. For the reliability of the instrument, Cronbach alpha reliability was used. The instrument had a reliability co-efficient level of 0.92. The data was collected by administering the questionnaire directly to the respondents by the researcher and two research assistants. Data collected were analyzed using SPSS statistical package. Mean and Standard deviation was used to answer the research questions, while a t-test was used to test the hypothesis at a 0.05 level of significance.

Any item with a mean value of 2.50 – 4.00 was considered agreed, while any item with a mean value of 0.00-2.49 was considered as disagree. For the test of significance, the probability (p) value was used in comparison

with the alpha value of.05 and at other relevant levels. If any item has a probability value greater than.05 (P > 0.05), it will be concluded that there is no significant difference in the mean responses of the respondents.

RESULTS

Research Question One

What are the entrepreneurial skills required of electrical installation and maintenance practice students in Ekiti state technical colleges?

Table 1: Mean Ratings on the entrepreneurial skills required of electrical installation and maintenance practice students

S/N	ITEMS	$\bar{X}$	REMARK
1	Skills for introducing or using new ideas/ways of doing things.	3.40	Agreed
2	Innovative skills of being an independent, imaginative, and constructive thinker.	3.70	Agreed
3	Entrepreneurial skills for recognizing and using tools and materials for production.	3.80	Agreed
4	Collaborative skills (associative partnership) are needed for joining corporative societies for problem-solving.	3.50	Agreed
5	Personal entrepreneurship skills: Ability to persistently research and find relevant information	3.80	Agreed
6	Ability to keep record/inventory of materials, tools and equipment	3.54	Agreed
7	Ability to interact with people openly and fairly	3.64	Agreed
8	Ability to encouraged innovation	3.60	Agreed
9	Skills to be critical to come up with innovative ideas	3.62	Agreed
10	Ability to organize and build network	3.30	Agreed

Data presented on the Table 1 showed that the mean ratings of items 1-10 are 3.40, 3.70, 3.80, 3.50, 3.80, 3.54, 3.64, 3.60, 3.62 and 3.30 respectively. All the mean ratings are above the cut-off point of 2.50. This means that the respondents agreed that; Skills for introducing or using new ideas/ways of doing things. Innovative skills of being an independent, imaginative and constructive thinker. Entrepreneurial skills for recognizing and using tools and materials for production. Collaborative skills (associative partnership) are needed for joining corporative societies for problem-solving. Personal entrepreneurship skills: Ability to persistently research and find relevant information. Ability to keep record/inventory of materials, tools and equipment. Ability to interact with people openly and fairly. Ability to encouraged innovation. Skills to be critical to come up with innovative ideas. Ability to organize and build network. The mean of 3.59 found to be above the cut-off point of 2.50. This implies that they are entrepreneurial skills training required of EIMP students in Ekiti state technical colleges.

Research Question Two

What are the practical skills required of electrical installation and maintenance practice students in Ekiti state technical colleges?

Table 2: Mean Ratings on the practical skills required of electrical installation and maintenance practice students

S/N	ITEMS	$\bar{X}$	REMARK
1	Take into consideration the IEE regulation required for the Installation of electrical machines	2.90	Agreed

2	Make accurate sketches and drawings of the electric circuit for Installation	3.04	Agreed
3	Select appropriate tools and equipment for the installation of the electrical machines	2.84	Agreed
4	Possession of troubleshooting skills in EIMP.	3.60	Agreed
5	Skills in electrical wiring and installation for job creation.	3.74	Agreed
6	Practice safe working methods of electrical systems	3.28	Agreed
7	Diagnoses basic faults and recognize the associated signs	3.02	Agreed
8	Use circuit diagram as an aid for maintenance	3.28	Agreed
9	Make appropriate installation of electrical accessories and fittings	3.20	Agreed
10	Testing of electrical installation	3.22	Agreed

Data presented on the Table 2 showed that the mean ratings of items 1-10 are 2.90, 3.04, 2.84, 3.60, 3.74, 3.28, 3.02, 3.28, 3.20 and 3.22 respectively. These means are all above the cut-off point of 2.50. This means that the respondents agreed that; Take into consideration the IEE regulation required for the Installation of electrical machines. Make accurate sketches and drawings of the electric circuit for Installation. Select appropriate tools and equipment for the installation of the electrical machines. Students need troubleshooting skills for Competency. Skills in electrical wiring and installation for job creation. Practice safe working methods of electrical systems. Diagnoses basic faults and recognize the associated signs. Use circuit diagram as an aid for maintenance. Make appropriate installation of electrical accessories and fittings. Testing of electrical installation. The cluster means of 3.21 was also found to be above the cut-off point of 2.50. This implies that there are practical skills required of EIMP students in Ekiti state technical colleges.

Hypothesis 1

Table 3: The t-test Analysis of the Mean Responses of the Male and Female Respondents on the entrepreneurial skills required of electrical installation and maintenance practice students.

S/N	**ITEMS**	Sig.	Remarks
1	Skills for introducing or using new ideas/ways of doing things.	0.71	NS
2	Innovative skills of being an independent, imaginative, and constructive thinker.	0.53	NS
3	Entrepreneurial skills for recognizing and using tools and materials for production.	0.24	NS
4	Collaborative skills (associative partnership) are needed for joining corporative societies for problem-solving.	0.19	NS
5	Personal entrepreneurship skills: Ability to persistently research and find relevant information	0.44	NS
6	Ability to keep record/inventory of materials, tools and equipment	0.62	NS
7	Ability to interact with people openly and fairly	0.79	NS
8	Ability to encouraged innovation	0.11	NS
9	Skills to be critical to come up with innovative ideas	0.46	NS
10	Ability to organize and build network	0.32	NS

Table 3 shows that all the ten items had their significant value to be greater than .05 (P>0.05). This indicated that, there was no significant difference between the mean responses of male and female teachers on the on the entrepreneurial skills required of electrical installation and maintenance practice students, therefore the hypothesis which stated that there is no significant difference in the mean responses of male and female teachers on the entrepreneurial skills required of electrical installation and maintenance practice students in Ekiti state technical colleges was accepted.

Hypothesis 2

Table 4: The t-test Analysis of the Mean Responses of the Male and Female Respondents on the practical skills required of electrical installation and maintenance practice students.

S/N	ITEMS	Sig.	Remarks
1	Take into consideration the IEE regulation required for the Installation of electrical machines	0.65	NS
2	Make accurate sketches and drawings of the electric circuit for Installation	0.38	NS
3	Select appropriate tools and equipment for the installation of the electrical machines	0.23	NS
4	Possession of troubleshooting skills in EIMP.	0.10	NS
5	Skills in electrical wiring and installation for job creation.	0.65	NS
6	Practice safe working methods of electrical systems	0.70	NS
7	Diagnoses basic faults and recognize the associated signs	0.62	NS
8	Use circuit diagram as an aid for maintenance	0.22	NS
9	Make appropriate installation of electrical accessories and fittings	0.71	NS
10	Testing of electrical installation	0.33	NS

Table 4 shows that all the ten items had their significant value to be greater than .05 (P>0.05). This indicated that, there was no significant difference between the mean responses of male and female teachers on the on the practical skills required of electrical installation and maintenance practice students, therefore the hypothesis which stated that there is no significant difference in the mean responses of male and female teachers on the practical skills required of electrical installation and maintenance practice students in Ekiti state technical colleges was accepted.

DISCUSSION

The results revealed that the teachers agreed that skills for introducing or using new ideas/ways of doing things. It was their perception that EIMP students should possess; innovative skills of being independent, imaginative, and constructive thinker; Entrepreneurial skills for recognizing and using tools and materials for production, Collaborative skills (associative partnership) are needed for joining corporative societies for problem-solving, Personal entrepreneurship skills: Ability to persistently research and find relevant information They agreed strongly that the entrepreneurial skills to keep record/inventory of materials; personal entrepreneurship skills;, ability to persistently research and ability to organize and build network. Entrepreneurial aspects of science education should include courses in business innovation, job creation, management of small and medium scale enterprises, accessing of funds/finance sourcing, and introduction to financial accounting (Moemeke, 2013).

This finding corroborates the views of Okwelle and Owo (2018) that TVET inculcates relevant entrepreneurship skills in the learner for job creation and self-development.

The findings of this study revealed the practical skills required of EIMP students to graduate with competent skills. These items identified by the respondents revealed that practical skills such as; taking into consideration the IEE regulation required for the Installation of electrical machines, Make accurate sketches and drawings of the electric circuit for Installation, Select appropriate tools and equipment for the installation of the electrical machines, troubleshooting skills for Competency, Skills in electrical wiring and installation for job creation, practicing safe working methods of electrical systems, Diagnose basic faults and recognize the associated signs, Using circuit diagram as an aid to maintenance and Testing of electrical installation are required of EIMP students in order to graduate with competent skills. This is in agreement with the findings of Akinduro (2006) who conducted a study on electrical installation and maintenance practical skills needed by technical college graduates to enhance their employability in Ondo State.

CONCLUSION

Based on the findings of the study, it was concluded that electrical installation and maintenance practice students/ graduates needed Entrepreneurial skills, and practical skills training to graduate with competent skills in technical colleges in Ekiti state. The skills if well acquired by the students will go a long way to equip them to face the challenges of self-reliance like being able to produce goods and services of utility value. It was discovered that the inability of most of the graduates to be self-employed was as a result of non-possession of the entrepreneurial skills necessary for self- employment. Therefore, the rate of unemployment can be reduced if technical colleges are exposing to modern technology through the sustainability factors, acquiring the practical skills and entrepreneurial skills to be able to serve the industries, the society and to be self-employed after graduation.

RECOMMENDATIONS

From the findings of the study, the following recommendations are made:

1. Electrical installation and maintenance work skills should be encouraged by teachers for job creation and self-reliance of technical college graduates in Ekiti State.

2. All identified skills should be integrated into the curriculum of technical colleges by curriculum planners for training of students.

3. Government should endeavor 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 upon graduation.

4. Emphasis should be placed on practical's while as a student.

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