ASSESSMENT OF TEACHERS COMPETENCY IN ELECTRICAL INSTALLATION AND MAINTENANCE WORK FOR STUDENTS SELF-RELIANCE IN TECHNICAL COLLEGES IN BAYELSA STATE.

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Abstract

The study assessed teachers competency in Electrical Installation and Maintenance Work for students' self-reliance in technical colleges in Bayelsa state. Three research questions guided the study. The study adopted descriptive survey research design. The population of the study was 37 comprising of 31 Electrical Installation and Maintenance Work tech-3 students and 6 Electrical Installation and Maintenance Work teachers from two technical colleges in Bayelsa state. There was no sampling size due to the small population. The instrument for the data collection was a self-structured questionnaire designed after the pattern of 4point rating scale. The instrument was validated by three experts: one expert from the Department of vocational and technology education, Rivers State University and two of the teachers in two different technical colleges in Bayelsa State. The reliability coefficient of 0.86 was obtained using Cronbach Alpha. Research questions were answered with mean and standard deviation. The study find out that teachers are very competent in domestic installation and students as well and this will result to self-reliance of the students. The study also find out that teachers are competent in rewinding of electric machines. The finding revealed that teachers are incompetent in electric motors.it was recommended among others that Electrical Installation and Maintenance Work teachers should be encouraged to go for training especially in their areas of incompetency through, in-service and sandwich programmes.. Competent teachers of Electrical Installation and Maintenance Work should employed by the government to teach in technical colleges of States.

Keywords: Electrical Installation and Maintenance Work, Teachers Competency, Students Self-Reliance.

INTRODUCTION

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". This has drawn attention to the significance of Technical and Vocational Education (TVE) in manpower development, from various countries around the world. TVE has been seen as the only

attracting programme that tackles the peril of poverty and creates employability skills.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.

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 (Odika& Tom, 2020).It is the grassroots of Technical and vocational Education Training program (TVET).

According to NBTE,(2011) the quality of academic programmes in technical colleges is regulated by National Board for Technical Education 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). According to Mohammed, Usman and Raymond, (2019*)* Technical colleges were recognised to train individuals to obtain, basic scientific knowledge, practical skills and attitudes essential as craftsmen and technicians at sub professional level, to meet the manpower needs for national development. Technical college's graduates need to acquire the essential new inclination of knowledge of subject matter, practical skills and instructive knowledge for effective outcome of the goals and objective of Technical Colleges. This calls for the technical competency of the teacher in order to attain success.

Competency is the ability of someone to perform a task in which he/she had been trained. According to Danielson (2016), Competency in teaching refers to the ability of a teacher to exhibit on the job skills and knowledge gained as a result of training. James (2013), states that competency is a bunch of connected knowledge, skills, abilities that affects a major part of one's job that can be measured against well-accepted standards, and that can be improved through training and development.

Teachers' competency therefore is the ability of a teacher to effectively and efficiently transfer all the knowledge and skills he had acquire during his/her training to his students. Teachers' competency augments a teacher's ability to create an atmosphere that is reasonable, understanding, and tolerant to different students with different ideas, experiences, and backgrounds.Anobi (2016) recognizes that as true educators, teachers are always learning; and teachers need to continue to prove their qualification at all times for students' performance. If a student is asked about a teacher who is highly qualified and competent, they will most likely say that it is the teachers who spend extra time with them and who makes the class content clear and achievable (Lewis, 2015).

The teaching skills of a teacher can be measured based on the teacher's abilities around how he is well able to comprehend his subject matter and transform the knowledge of the subject matter to be communicated effectively to his learners (Ganyaupfu, 2013). Teaching requires one to first understand the specific outcomes of the topic as well as the subject matter structures of the respective discipline. Competent teachers have high expectations of students in terms of both their standard of learning and their behaviour, they also help their students meet those

expectations. They have high expectations of themselves and their own learning which lead them to professional development in their subject area.

Teachers' competency is the ability of the teacher to communicate the relevant skills, knowledge and methods steadily over time to meet the predictable performance of students (Mark, 2011). He further said there are two aspects of teacher's competence: competency in the subject area and the pedagogical competency; the application of methods relevant to effectively participate in the classroom is the pedagogical competency, while the essential skills and knowledge found in the subject area is the technical competency.

Knowledge of subject area is the total know how of the teacher in is subject area for effective teaching and learning of the skills acquired (Amenger in Mohammed, Usman& Raymond, 2019*)*.

The effectiveness of teaching is measured by a teachers effectiveness and competency, that means a teacher that teach effectively is a competent teacher.According to Fldrez and Sammons, (2013), an effective teacher struggle to stimulate and involve all their students in learning, they don't believe that some students cannot perform well. Kington*et al,* (2011), an effective teacher believes every student is capable of attaining success at school and they put in their best in making each student successful. Teacher competence is highly linked to the effectiveness or ineffectiveness of teaching. Subtly, the effectiveness of all educational programmes is dependent largely on the devotion and competency of teachers who constitute in the educational system (Adamu in Babayo, 2021)).

Therefore, comprehension of the instructional purpose or subject matter is a very important element ofteacher's competence. According to Shulman, (2012) the educational purposes for engaging in teaching are to assist learners gain knowledge, develop skills and standards to function well in the society. It arms them with prospect to acquire and learn new ideas, identify new concepts and allow students to enjoy their learning experiences. This will enhance learners' responsibility to become productive in the economy, contribute to the well-being of the social, economic and business community.

Conversely, the unqualified teachers are the ones who are boring and do not connect with their students.. Students do not care about educational certificates or years of experience but what the teacher has to impact them, (Ugochukwu, Paul & Elisha, 2019). Technical competency possessed by teachers enables them to prepare individuals for self-reliant and useful living in the society (Babayo, 2021).

Electrical installation and maintenance works as offered in technical colleges to prepare an individual with job-satisfying requirements towards employment and self-reliance (Mohammed, Usman, & Raymond, 2019). 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 (Odika& Tom, 2020). According to Alegbemi, (2010), electrical installation and maintenance is that part of technical education which deals mainly with electricity, principles of magnetism and forces of nature and materials for the benefits of mankind. 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 of machines and equipment, winding of electrical machines, testing and inspection of electrical installations, repair of electrical machine and others
The aim of Electrical Installation and Maintenance Work is to give training and impart the essential skills important to the making of craftsmen, technicians and other skilled personnel who will be resourceful and self-reliant (NBTE 2004). This is supported by the Federal Republic of Nigeria (2009) which stated that the objective of technical education is to provide technical training and impart the necessary skills leading to the production of skilled personnel who will be enterprising and self-reliant.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 (Odika& Tom, 2020).

However, according to Mohammed, Usman, and Raymond, (2019) acquisition of technical skills in electrical installation and maintenance work can only be effective if teachers in the trade are competent and knowledgeable in both theory and practical. Students' quickly loose respect and confidence in the teacher who is ineptitude at the trade or occupation he professes to teach. Thus, electrical installation and maintenance work trade teachers have to show mastery in both theory and practice of the trade.

Hence, come the reason for assessing teachers' competency in EIMW for students self-reliance in technical colleges in Bayelsa state. This will play crucial role in achieving academic objectives. This is supported by the National policy on Education which states that no education system can rise above the quality of its teachers (FRN, 2009).

Statement of Problems

Electrical installation and maintenance works skills learned in technical colleges are rested with abilities of equipping the students with required skills to drive them toss meaningfully to national economic development, be self-reliant, creates job for sustainability and reduce unemployment. This is in line with the federal government goal. This can be realised if the amount of knowledge and skill imparted to Electrical installation and maintenance work students meets the demand of industries for them to be employable or self-reliant. Nevertheless, most graduates of electrical installation and maintenance works are unemployed and could not 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 of electrical installation and maintenance work.The impartation of these knowledge and skills will be done by the teacher, this means the success of the students' knowledge and skill in electrical installation and maintenance work to a large extent is tied to the teachers competency in electrical installation and maintenance work. Hence, the need for assessment of teacher's competency in electrical installation and maintenance work for students' self-reliance in technical colleges in Bayelsa state.

Purpose of the Study

The main purpose of this study is to assess teachers' competency in electrical installation and maintenance work for students' self-reliance in technical colleges in Bayelsa state.
The study specifically sorts to find out:

1. Teachers' competency in domestic installation for student self-reliance in technical college, Bayelsa state.
2. Teachers' competency in rewinding of electric machines for student self-reliance in technical college, Bayelsa state.
3. Teachers' competency in Electric motor for students' self-reliance in Technical colleges, Bayelsa state.

Research Questions

The following research questions are raised for the purpose of this study;

1. To what extent are teachers competent in domestic installation for student self-reliance in technical college, Bayelsa state?
2. To what extent are teachers competent in rewinding of electric machines for student self-reliance in technical college, Bayelsa state?
3. To what extent are teachers competent in Electric motor for student's self-reliance in Technical colleges, Bayelsa state?

II. METHODOLOGY

Descriptive survey research design was adopted for this study, because it was considered suitable for this study. A well-structured questionnaire consisting of twenty-one items was used to obtain responses from tech-3 students of electrical installation and maintenance work and teachers in government technical colleges in Bayelsa state. According to Alio, cited byOdika and Tom,(2020) structured questionnaire and sampling methods are used to assess public opinion in order to obtain information from them.

The population of the study was 37 respondents which comprises of thirty-one (31) tech-3EIMW students and six (6) EIMW Teachers of electrical installation and maintenance work of two technical colleges in Bayelsa State. They were purposively sampled because it is assumed that tech-3 student would have been taught all the various aspect of EIMW. The study was a census as the entire population was studied; this is relatively due to the small size of the population.

A structured questionnaire titled "questionnaire on assessment of teacher competency in electrical installation and maintenance work (QATCEIMW)" with 21-item was designed in a 4-point rating scale developed by the researcher. The responses were Strongly Agreed (AS), Agreed (A), Disagreed (D) and Strongly Disagreed (SD) having numerical values of 4, 3, 2 and 1respectively.The instrument was subjected to face and content validation by one experts from the Department of vocational and technology education, Rivers State University and two of the teachers in the two different technical colleges in Bayelsa State. The internal consistency of the instrument was established using Cronbach Alpha reliability method and 0.86 was obtained as reliability coefficient of the instrument.

37 copies of questionnaires were administered and 37 were retrieved by the researcher for analysis.Data collected from respondents were analysed using mean and standard deviation to answer the research questions. The computation of the mean and standard deviation were carried out with Statistical Package for Social Sciences (SPSS). It was decided that an item

with a calculated mean value equal or greater than 2.50 (2.50 – 4.00) was rated agreed while item with the calculated mean less than 2.50 (0 – 2.49) was rated disagreed as required.

RESULTS

Research Question 1: To what extent is teacher's competency in domestic installation results to student self-reliance in technical college, Bayelsa State?

Table 1: Mean and Standard Deviation of Teachers' Competency in Domestic Installation Result to Student Self-Reliance in Technical College, Bayelsa State.

S/N	Items	Students			Teachers		
		Mean	S.D	Rmk	Mean	S.D	Rmk
1	I Understand electrical working diagrams very well	3.13	0.62	Agreed	4.00	0.00	Agreed
2	I you Know the different types of domestic surface wiring.	3.03	0.55	Agreed	3.50	0.55	Agreed
3	I Know different types of domestic conduit wiring.	3.00	0.52	Agreed	3.67	0.52	Agreed
	I Understand the principles of protecting electrical devices and installing them.	3.32	0.75	Agreed	3.33	0.52	Agreed
4	I Understand sequence for inspecting and testing domestic installations.	3.13	0.67	Agreed	3.67	0.52	Agreed
5	I Understand the terms used in illumination.	2.13	0.56	Disagr eed	3.50	0.55	Agreed
6	I Know various types of lamps for illumination.	2.58	0.85	Agreed	3.33	0.52	Agreed
	Ground Mean/SD	**2.90**	**0.64**		**3.57**	**0.45**	

Source: Researchers Field Work

Data in Table 1 shows the responses of teachers of EIMW with mean range of 3.33-4.00 and standard deviation range of 0.52-0.00. The students had a mean range of 2.13-3.32 and standard deviation range of 0.56-0.75. The standard deviation showed the homogeneity of the respondents, while the mean indicated that the respondents agreed on all the items of domestic installation resulting to students' self-reliance in technical colleges in Bayelsa State.

Research Question 2: To what extent is teacher's competency in rewinding of electric machines results to student self-reliance in technical college, Bayelsa state?

Table 2: Mean and Standard Deviation of Teachers Competency in Rewinding of Electric Machines Results to Student Self-Reliance in Technical College, Bayelsa State.

S/N	Items	Students			Teachers		
		Mean	S.D	Rmk	Mean	S.D	Rmk
1	I Understand the principles of operation of AC and DC machines and their applications.	2.94	0.85	Agreed	3.17	0.41	Agreed
2	I Know the installation of all types of electrical machines and equipment.	2.84	0.64	Agreed	2.67	0.52	Agreed
3	I Understand various methods of controlling electrical machines.	2.84	0.73	Agreed	2.83	0.98	Agreed
4	I Know methods of maintaining electrical machines and equipment.	3.23	0.62	Agreed	2.50	0.55	Agreed
5	I Diagnose faults in machines, equipment and installations.	2.55	0.62	Agreed	2.67	0.82	Agreed
6	I Know the installation of MICC cable.	2.35	0.84	Disagreed	2.33	0.52	Disagreed
	Ground Mean/SD	**2.79**	**0.72**		**2.69**	**0.63**	

Source: Researchers Field Work

Data in Table 2 shows the responses of teachers of EIMW with mean range of 2.50-3.17 and standard deviation range of 0.55-0.41. The students had a mean range of 2.13-3.32 and standard deviation range of 0.56-0.75. The standard deviation showed the homogeneity of the respondents, while the mean indicated that the respondents agreed on all the items except item 6 of rewinding of electrical machines resulting to students' self-reliance in technical colleges in Bayelsa State.

Research Question 3: To what extent is teachers' competency in Electric motor results to student's self-reliance in Technical Colleges, Bayelsa State?

Table 3: Mean and Standard Deviation of Teachers' Competency in Electric Motor Results to Student's Self-Reliance in Technical Colleges, Bayelsa State.

S/N	Items	Students			Teachers		
		Mean	S.D	Rmk	Mean	S.D	Rmk
1	I understand and can apply all statutory regulations during electrical winding work.	2.42	0.81	Disagree	1.83	1.17	Disagree
2	I can Identify and select appropriate tools and equipment used for winding jobs.	2.90	0.87	Agree	2.17	0.98	Disagree

3	I have acquired skills for preparation and interpretation of winding drawing.	2.48	0.77	Disagree	2.50	1.05	Agree
4	I have acquired skills for preparation and interpretation of winding drawing.	2.29	0.74	Disagreed	1.83	0.98	Disagreed
5	I have acquired skills for dismantling machines for rewinding them	2.45	0.77	Disagreed	2.00	1.10	Disagreed
6	I understand the rewinding of burnt static/rotating machines.	2.26	0.82	Disagreed	2.00	0.89	Disagreed
7	I know the skimming/undercutting of armature, commutators and slip rings.	2.32	0.79	disagreed	2.50	1.05	Agreed
8	I can Inspect rewound electrical machines and equipment and test for continuity, insulation, correct rotating voltage.	2.48	0.96	Disagreed	2.17	0.98	Disagreed
	Ground Mean/SD	**2.45**	**0.82**		**2.13**	**1.03**	

Source: Researchers Field Work

Data in Table 3 shows the responses of teachers of EIMW with mean range of 1.83-2.50 and standard deviation range of 1.17-1.05. The students had a mean range of 2.26 - 2.90 and standard deviation range of 0.82-0.87. The standard deviation showed the homogeneity of the respondents, while the mean indicated that the respondents disagreed on all the items except item items 3 and 7 for teachers and item 2 for students of electrical motors resulting to students' self-reliance in technical colleges in Bayelsa State.

Discussion of Findings

The study as presented in research question 1 (Table 1) above, revealed that teachers are competent in domestic installation as also seen in students responses. That means based on teachers competency in mastery and using the appropriate instructional method in teaching domestic installation, Students are able to understand electrical working diagrams. Know the different types of domestic installations, understand the principles of protecting electrical devices and how to install them. They also understand sequence for inspecting and testing domestic installations, the terms used in illumination and know the various types of lamps for illumination. These knowledge and practice will help students to be self-reliance. This opposes and contradicts the findings of other researchers such as: Bayo, (2021) that electrical installation and maintenance work trade teachers teaching in the skills acquisition centres in Yobe state needed technical competency improvement in all the items listed in domestic electrical installation. Also Mbaga, (2011) conducted a study on the retraining needs electrical installation and maintenance work teachers and indicated that there is low level of possession of technical skills by teachers in domestic electrical installation module.

Findings in research question 2 as in table 2 revealed teachers competency in rewinding machines as also affirmed from the students responses. The strategies and mastery teachers

imply in rewinding have made students to understand the operational principles of AC and DC machines and their applications, Know the installation of all types of electrical machines and equipment, understand the maintenance and control of various electrical machines and be able to diagnose fault. This is contrary to the findings of Bayo, (2021) that the teachers needed the technical competency in all the 16 items of rewinding of electrical machines. This also disagrees with Terrel, (2004) that many electrical teachers need more improvement in winding of electrical machine.

Findings to research question 3 as in table 3 revealed that, Teachers are not competent in electric motors as also indicated by the students' responses. It is what the teachers know they can teach the students. The incompetency of teachers has affected students negatively since the students relay on the teachers for knowledge. Students don't understand and cannot apply all statutory regulations during electrical winding work, they have not acquired skills for preparation and interpretation of winding drawing and dismantling machines for rewinding. They don't have the understanding for rewinding of burnt static/rotating machines and the skimming/undercutting of armature, commutators and slip rings. This is one of the major area where EIMW teachers need to improve on, knowing through well that the role of teachers competency in students self-reliance in any subject matter cannot be overemphasize. Technical competency possessed by teachers enables them to prepare individuals for self-reliant and useful living in the society (Babayo, 2021).

Conclusion

The findings of this study had shown that teachers are competent in some areas of EIMW and deficient in other aspect. The arrears of teachers competency is also shown in students' responses. This confirms the fact that there is need for the assessment of teachers' competency in EIMW from time to time. This will call for developmental training in areas of deficiencies, so that students of EIMW can be self-reliance after graduation. . It is believed that when competent teachers teach these skills, it would facilitate job creation, self-reliance and sustainability in Bayelsa State.

Recommendations

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

1. EIMW teachers should be encouraged to go for training especially in their areas of incompetency through, in-service and sandwich programmes.
2. Government should also organize workshops/seminars for teachers of EIMW on the use of modern tools and equipment in the different areas of EIMW.
3. Competent teachers of EIMW should employed by the government to teach in technical colleges of States.

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