

Assessment of Facilities and Method of Improving Students Performance in Electrical Installation and Maintenance Work in Technical College Kaduna State, Nigeria.

¹S. S. Haruna, ²A. D. Mansur, ³A M Idris, ⁴M Abdulkadir, ⁵D Ibrahim & ⁶A B Kagara

¹Department of Electrical and Electronics Technology Education,
Kaduna Polytechnic, Kaduna.

²Science and Technical Education Board Katsina, Government Girls' Secondary
School Malumfashi, Katsina State.

^{3,4,5} Department of Industrial and Technology Education,
Federal University of Technology, Minna.

Corresponding E-mail: saadiyasaniharuna@gmail.com, +234 806 127 9030

Abstract

The purpose of this study was to assess student performance of electrical installation and maintenance works in technical college Malali in Kaduna, state Nigeria". The study was guided by three research questions and three null hypotheses was conducted in technical college Malali in Kaduna State using descriptive survey research design. The population of the study was 70 which comprised of 10 technical teachers 60 student of technical college Malali Kaduna state. The entire population was used because it was manageable as such there was no sampling. A 19item structured questionnaire was developed for assessment of Students of electrical Installation and Maintenance Works in technical college Malali Kaduna state. Questionnaire developed, was validated by three experts from department of Electrical and Electronics Technology Education Kaduna polytechnic. Test retest method was used to establish the reliability of the instrument and reliability coefficient of 0.78 was obtained using Pearson Product Moment Correlation Coefficient method. Data collected for the study were analyzed using Mean statistics to answer the three research questions while t-test of different between two means was used to test the three null hypotheses at 0.05 level of significance. Findings of the study revealed among others. Inadequate equipment and facilities for students practical, Unqualified and inadequate trained technical teachers. Based on the findings the following recommendation were made government should provide fund for building infrastructure and the purchase of new equipment and facilities, adequate qualified and trained technical teachers should be provided, strategies for teaching and learning technical education should be provided, government and teachers should set up advisory committee to bring about desired performances, proper planning and adequate supervision should be made in technical college Malali Kaduna state.

Keywords: Assessment, Students' Performance, Electrical Installation and Maintenance Work.

Introduction

Assessment bridges the gap between teaching and learning. Perhaps second only to teaching, assessing student performance is fundamental role in the life of a teacher. Assessment is important because it provides students with feedback about their performance; this information reinforces their areas of strength and highlights areas of weakness. Using this feedback, students can direct their study strategies and seek addition resources to improve their performance (Springer 2014).

Feedback is an important aspect of learning in education. Feedback can be in the form of advice, criticism or information about how good or useful a given task was carried out especially from students (Hornby, 2006). A learner cannot be said to have learnt until there is a process of assessing whether the skill has been acquired or not. Learning outcomes include the cognitive, the affective and the psychomotor, but most often the cognitive aspects are assessed (Olaitan, & Ali, 2000). Many activities in science and technology involve application of manual dexterity and therefore call for assessment of practical skills acquisition to ensure that learning has taken place (Mager, 1997). In the same vein, Ningi (2001) postulated that, assessment of teaching and learning processes in technical and vocational education is still conducted using traditional way without injecting new approaches by teachers which is actually depriving the students from learning the right skills needed for self-employment.

Electrical technology however, not only involves the design and production of all the electrical systems mentioned, but also the installation, testing and maintenance of these systems. A number of challenges arise with the implementation of mathematics, science, and engineering to develop these modern wonders. These challenges include problem-solving skills, ability to diversify, a strong educational background, and continuing learning (Aggeliki 2018).

In the same vein, Nwachukwu, Bakare and Jika (2011) submitted that technical collage provides students through training with, the relevant and adequate knowledge, skills and attribute for employment under the guidelines of a teacher in related occupations. The place of skills acquisition in technical education cannot be over emphasized and to achieve these objectives, too many trades are learnt in technical collages. Ede, Miller and Bakare (2010) identified that students undertaking technical education programmes are trained in auto-mechanics, wood, plumbing, computer craft, mechanical trades, radio, television. (RTV) and electronics works, electrical installation and maintenance works.

In view of the National Board for Technical Education programme "(NBTE, 2013) electrical/electronic offers trade in Application maintenance and repairs Electrical installation and maintenance works Instrument Machine Radio, television (RTV) and maintenance works.

In light with the above, electrical installation and maintenance works as offered in technical collage 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 needs of the individual allowing the students to identify their career objectives. Skills is the ability to do something well, usually gained through training or experience. Skill acquisition in electrical installation and maintenance works employs measures and develops jobs in electrical installation geared towards making students confident and self-reliant. Electrical installation and maintenance works curriculum is design to prepare the student to acquit entry level knowledge and manipulative skills for employment in the electrical industry in Nigeria and Kaduna s state in particular. Students in Electrical installation trades are expected to possess skills for excellence in installation of electrical machines and equipment, winding' of electrical machines, testing and inspection of electrical installations and repair of electrical machines. Electrical installation and maintenance is one of the technical courses run in technical colleges in Kaduna state.

Electrical installation is an assembly of components that allows you to reliably and safely use electrical power around your home. An electrical installation comprises all the fixed electrical equipment that is supplied through the electricity meter. It includes the cables that are usually hidden in the walls and ceilings, accessories. According to Raskar (2019) said Electrical maintenance involve fault diagnosis, routine services and repair of electrical components of machine, households electrical/electronic equipment. Despite the effort of government and nongovernmental agencies in enhancing the educational development in Nigeria, the Kaduna state ministry of education, report (2015) shows that the academic performance in electrical installation and maintenance work in technical colleges has declined greatly it was also observed that failure of students in electrical installation and maintenance is high -in Government technical college Malali in recent years.

However, it is discovered that most consumable materials, tools and even power supply has contributed to the poor performance of the students. In view of the above, the researcher ought to investigate the factors responsible for failure of students in electrical installation and maintenance work in technical college Malali, Kaduna state.

Purpose of the Studies

The purpose of this study is to assess the performance of the students of the electrical installation and maintenance in technical college Malali in Kaduna state. The researcher intends to:

1. Identify the facilities for teaching electrical installation and maintenance work.
2. Determine the teaching techniques used by the Teachers in teaching electrical installation and maintenance work.
3. Determine the strategies for improving the performance of students of electrical installation and maintenance work.

Research Questions

The following research question guided the study.

1. What are the equipment facilities for teaching electrical installation and maintenance work?
2. What are the teaching techniques used by the teachers for teaching electrical installation and maintenance work in technical college Malali?
3. What are the strategies to be used -for improving the students' performance in electrical installation and maintenance work in technical college Malali?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance

- HO₁:** There is no significance difference between mean responses of teachers and students on the equipment and facilities for teaching electrical installation and maintenance work
- HO₂:** There is no significance difference between mean responses of teachers and student on Techniques used in teaching electrical installation and maintenance work in technical college
- HO₃:** There is no significance difference between mean responses of teachers and student on strategies to be used -for improving the students' performance in electrical installation and maintenance. Work in technical college.

Methodology.

A descriptive survey research design was adopted for this study. The study was carried out in Government technical college Malali of Kaduna State. The targeted population for this study was 70 respondents which comprises 60 Students and 10 Teachers of Government Technical College Malali Kaduna State. The entire population was used for this study. Hence there was no sampling. A Structured questionnaire titled Electrical Installation Maintenance Work Students' Performance Questionnaire (EIMWSPQ) developed by the researchers and validated by three experts was used for data collected for the study. All sections of research questions were structured so that respondents expressed their opinion on a four rating scale of Strongly Agree(4), Agree(3), Disagree(2) and Strongly Disagree(1). The reliability coefficient of instrument was 0.78 through Pearson Product Moment reliability coefficient. 70 copies of questionnaire were distributed to Teachers and Students by the researchers in Government Technical College Malali Kaduna State. Thus, 67 copies duly filled by the respondents were returned to the researchers and returned rate is 95.7%. Mean was the statistical tool used to analyze the data for answering research question. A mean score of 2.50 was used as a bench mark for accepting or rejecting items. Therefore, items with mean score of 2.50 and above were considered agreed; where items with mean score of 2.49 and below were considered disagreed.

Research Question 1

What are workshop equipment and facilities for teaching electrical installation and maintenance work in technical collage Malali?

Table I: The mean responses of data of both teachers and students on workshop equipment and facilities.

S/No	Items	Mean	Decision
1.	There are enough multi meters in the school workshop.	3.08	Agreed
2.	The existing instruments/equipment in the electrical workshops are outdated.	2.91	Agreed
3.	There are adequate text books in the library.	2.03	Disagreed
4.	Enough wires are provided to carry out electrical installation practical.	2.03	Disagreed
5.	The workshop has enough screw driver for the student.	2.50	Agreed
6.	There are enough micro meters for carrying out practical in electrical installation workshops.	1.58	Disagreed
7.	The electrical workshop has no enough boards for installation practical.	2.33	Disagreed.

Table I above showed that respondents agreed with items 1, 2, and 5 that there are enough multimeter in the workshop for students practical, and that the existing equipment and instrument in the electrical workshop are outdated and that the workshop has enough screw driver in the workshop. But both the teachers and the students disagreed with items 3, 4, 6 and 7 that there are adequate textbooks in the library, there are enough-wires for practical work in electrical installation and maintenance work in the school, there are enough micro meters in electrical/electronics workshop this shows the department has no standard workshop for electrical installation and maintenance practical.

Research Question 2

What are the teaching techniques used by the teachers for teaching electrical installation and maintenance work in technical college malali?

Table 2: The mean responses of data analysis of both teacher and students on teaching techniques used by teachers in electrical installation and maintenance work

S/No	Items	Mean	Decision
1.	Teachers possess electrical installation and maintenance work practical, skills.	3.05	Agreed
2.	The teachers teaching electrical installation and maintenance know various method of teaching.	3.08	Agreed
3.	Electrical installation and maintenance teachers master the subject.	2.58	Agreed
4.	The teachers teaching electrical installation and maintenance work demonstrate the' subject practically with the students.	2.33	Disagreed
5.	Electrical/electronics technology teachers are competent to tech electrical installation and maintenance work.	2.91	Agreed
6.	Electrical/electronics technology' teachers evaluate students practically	2.03	Disagreed
7.	The interpersonal relationship between teachers and student is encouraging.	2.33	Disagreed
8.	Electrical/electronics technology' teachers evaluate students practically	2.03	Disagreed

Table 2: indicated that the mean scores of item 8, 9, 10, and 12 agreed and the mean scores of item 11, 13, and. 14 disagreed that the teachers teaching electrical installation and maintenance work demonstrate the subject without practically with the students; electrical/electronic technology teachers always evaluate the students without practical. They also disagreed that the relationship between them and the teachers is encouraging. While the mean scores of item 8, 9,10 and 12 agreed that the teachers have no mastery the subject, and know various method of teaching electrical installation and maintenance subject matter, the teachers teaching electrical installation and maintenance teaches the subject effectively; electrical and electronics technology teachers are not competent to teach electrical installation and maintenance work.

Research Question 3

What are the strategies to be used for improving for student performance of electrical installation and maintenance work in Technical College?

Table 3: The mean responses of data analysis of research question (3) of both teachers and students on strategies for improving the performance the performance of student in electrical installation and maintenance work.

S/No	Items	Mean	Decision
1.	Provision of skilled and experienced teachers of electrical installation and' maintenance work in the school	2.91	Agreed
2.	Adequate provision of workshop -facilities in the school.	3.08	Agreed
3.	Provision. of well trained technicians.	2.34	Disagreed

4.	Provision of adequate library facilities that helps the environment of students examination.	2.33	Disagreed
5.	Enough time should be allocated for electrical installation and maintenance work practical.	3.05	Agreed

Table 3: indicated that the mean scores of items 15,16, 17,18, and 19 agreed that skilled and experienced teachers of electrical installation should be allocated to the school, adequate provision of workshop facilities, equipment will help improve electrical installation and maintenance subject in the school, and provision of will trained' technician and teachers will help also, enough time should be allocated for practical.

Findings/Discussion

The study revealed that Teachers Related Factors Responsible for Students performance in Electrical Installation and Maintenance Work in Technical College Malali of Kaduna State, includes teachers do not always take students to workshop during practical period, teachers do not allowed students to participate during process of instruction, Improper use of teaching method, inadequate workshop facilities among others. This is in line with the opinion of Benjamin (2006) who stated that, the finding of teachers related factors in student performance in electrical installation and maintenance work in technical collages include:- teachers do not always take students to workshop during practical period, teachers do not allowed students to participate during process of instruction, improper use of teaching method.

Furthermore the study showed that facilities Related Factors Responsible for Students performance in 'Electrical Installation and Maintenance Work in Technical College Malali in Kaduna state, includes inadequate galvanometer, multimeters, Inadequate qualified teachers, among others. This is according to Bukar (2009) who stated that, the finding is in line with facilities related factors responsible for students' performance in electrical installation and maintenance work. There are un-qualified teachers, teaching electrical installation and maintenance work in technical college Malali in Kaduna State.

Finally, the study revealed that the strategies for improving Students performance in Electrical Installation and Maintenance Work Technical College Malali of Kaduna State, includes Workshop should be well equipped with tools and material for students use. Teachers need more training both practically and theoretically to enables the teachers to install and maintain electrical installation, Opportunity for training and retraining of teachers should be provided among others. This is according to the findings of Ali (2004) who found that strategies for improving student performance in electrical installation and maintenance work in technical college Malali of Kaduna state, include: - workshop should be well equipped with tool and materials for students use, teachers need more training both practical and theory to enable the teachers to installed and maintained electrical installation, opportunity for training and retraining of teachers should be provided.

Conclusion

In conclusion, in order to improve the performance of students in electrical installation and maintenance work in Kaduna state, the government, teachers and students should work together collectively for the betterment of Kaduna state. From the result of the data analyzed, interpreted and discussed, some important implications of them have been revealed. Study conducted by expert notably (Fafunwa 1974) have

suggested very important ways in which the government and the teachers must communicate to bring about the revolution. Government and the teachers must set up advisory committees to bring about desired performances. This action on the part of the two agents could only be achieved if there is a forum "where government and teachers could express their feelings to bring about the revolution. Although there are many strategies that facilitate effective performance, the implementation is that there must be a lot of planning and supervision on the part of the policy makers. Government in terms of finance, curriculum, location of schools and constitution of the committee members.

Recommendation

The following suggestions were offered as a stepping stone towards improving students' performance:

1. Government should provide qualified and well trained teachers to technical colleges.
2. Adequate fund should be provided for the provision of workshop facilities and equipment
3. Provision of strategies that will help improve teaching and learning in technical college Malali Kaduna
4. Government should set up advisory committee to bring about desired performances which could be achieved through forum where teachers and students could express their feelings to bring about revolution.
5. Proper planning and adequate supervision should be made from the part of the policy makers for effective implementation.

References

- Ageleki (2018), Rudiments of Teachers Education in Nigeria: Academic Trust Fund Publishers.
- Ali, A (2004). Laboratory instruction and safety in science. *Teaching Journal of Science Teachers Association of Nigeria* (STAN)17(3)80-85,
- Benjamin (2006). "Grading Class Contribution in Socrates MNSE 167 - 170 New York McGraw - Hill.
- Bukar (2009) "The roles of manpower in Nigeria. George Allen and U. and Ltd.
- Ede, Miller and Bakare (2010). Technology education laboratory facility management. A paper presentation of the first pre — annual national conference workshop of technical college Malali Kaduna, 3rd — 6th August, 200.0
- Fafunwa, A.B. (1974). *History of education in Nigeria*. London: Geoge Allen and Unwin.
- Hornby, A.S. (2006). Oxford Advanced Learner's Dictionary of Current English(5thEd.).London. Universitys
- Mager, R.F. (1997). *Preparing instructional objectives: A critical tool in the development of effective instruction*. Atlanta: The Centre for Effective Performance Inc.

Ningi, I.M. (2001). Factors militating against effective teaching and learning of metal work in Bauchi, Gombe, Jigawa and Taraba States technical colleges. *An Unpublished M. Ed Thesis*, Department of Industrial Technical Education, Nsukka. University of Nigeria

Nwachukwu, Bakare, & Jika (2011). "Improving Technical Education Teaching, our School" *Journal of Technical Education Association of Nigeria Vol. 7* PP140-145.

Oguwa (2016) *fundamental of educational psychology*. John-lad Lagos. Okoro (2006) *Intelligent and Affectivity. Their relationship during. childdevelopment*. Annual review monograph, Polo alto, CA annual review Oluwatoyo & Adebule (2009); principle of Ipresture teaching by Olaitanosula

Olaitan, S.O and Ali, A. (1997). *The making of curriculum: theory and process*, Onitsha: Noble Graphic Press.

Raska (2019) *Understanding Curriculum*. University of Nigeria, Nnsukka.