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ASSESSMENT OF ELECTRICAL/ELECTRONIC TEACHERS' LESSON PLANNING, IMPLEMENTATION AND EVALUATION OF PRACTICAL SKILLS IN TECHNICAL COLLEGES OF KANO STATE, NIGERIA

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Abstract

The study assessed electrical/electronic teachers' lesson planning, implementation, and evaluation of practical skills in technical colleges in Kano State, Nigeria. The study used a descriptive survey research design. The study population comprised 60 Electrical/Electronics teachers in Technical Colleges across the three senatorial zones of Kano State, Nigeria. The entire population was used. A twenty-seven (27) items questionnaire was used for data collection. The instrument was validated by three experts from Bayero University Kano, Department of Industrial and Technology Education. The reliability of the instrument was determined using Cronbach's Alpha, which gave an index 0.72. The data collected were analyzed using Statistical Package for the Social Science (SPSS) version 23. Descriptive statistics such as mean and standard deviation were used to answer the research questions. The findings indicate that teachers effectively planned, implemented, and evaluated lessons, by using clear objectives of the lesson, practical activities, and modern resources, which collectively enhanced students' practical skills acquisition. The study recommends that teachers continue to plan lessons focusing on practical skills, industry standards, and emerging technologies. The government, through the Ministry of Education, should provide modern equipment and training for teachers, and school administrators should monitor and evaluate lesson implementation to ensure effective skill acquisition.

Keywords: Electrical/Electronics, Lesson Plan, Practical Skills, Implementation, Evaluation.

Introduction

Vocational and Technical Education (VTE) is any form of education aimed at preparing persons for employment in an occupation or group of occupations (Uwaifor, 2010). Aviomoh (2014) viewed VTE as an aspect of

education that leads to the acquisition of practical and applied skills. Vocational and technical education is designed to prepare students for industry, agriculture, commerce, and home economics. Vocational and Technical Education (VTE) are courses taught at universities, polytechnics, colleges of education, and technical colleges (Ugwuja, 2019). Technical and vocational education in Nigeria, particularly regarding the evaluation of electrical teachers and the facilities needed for effective instruction (Olaitan, 1996). The study by Olaitan (1996) highlights the need for electrical and electronics teachers to possess adequate pedagogical and technical competence, fostering learning attitudes, inclusiveness and equity to effectively impart skills to their students.

Technical colleges in Nigeria are established to prepare individuals to acquire practical skills and basic scientific knowledge (Okorie, 2015). The Federal Republic of Nigeria (2009) outlined the aim of technical colleges, which includes preparation for useful living within the society and preparation for higher education. It means that the quality of instruction at technical colleges in addition to the development of the cognitive or intellectual abilities of the youth, be oriented towards the acquisition of appropriate work skills, abilities, and competences for the individual to live and contribute to the development of society. Technical Colleges as equivalent to senior secondary but designed to prepare individuals to acquire practical skills, basic scientific knowledge and attitude required as craftsmen and technicians at sub-professional level (Akpan, 2013).

Electrical and electronics trade is one of the vocational programs offered at technical colleges; it is designed to produce electrical and electronics technicians for the construction/electrical and electronics industry. In electrical and electronics trade, teachers are expected to evaluate students learning outcomes, selecting appropriate assessment techniques in order the students to work with materials, tools, equipment, and machines to install wiring, perform basic electrical operations, construct circuits, and complete electrical installations in the industry (National Board for Technical Education [NBTE], 2011). A technical teacher is a person who gives instruction to a learner, i.e., a person who communicates knowledge, skills, and attitudes to students, who gives instruction and communicates knowledge, skills, and attitudes in the electrical and electronics trade to students. There are two categories of teachers of the electrical and electronics trade, which could be found at the technical college: these are qualified teachers and instructors. A qualified teacher of electrical and electronics trade is

an individual who has teaching qualifications such as Nigeria Certificate in Education (N.C.E Technical), Bachelor of Education (B.Ed. Technical), or a Master of Education (M.Ed. Technical) but instructors electrical and electronics trade is a person who has been teaching electrical and electronics trade to students at a technical college with qualifications such as Ordinary National Diploma (OND) or Higher National Diploma (HND) as stated in the National Policy on Education (NPE, 2013).

Teaching method could be regarded as the process and procedure adopted by the teacher to guide and prepare students through an organized and planned learning activity to accomplish educational goals (Kennedy, 2018). Teachers of Electrical/Electronics are the ones who give instruction and impart knowledge, skills, and attitudes to students. Teachers are the conduit through which the knowledge and practical skills of could be transmitted; as such, they should use appropriate teaching and supervisory strategies together with learning resources and teachers must use relevant pedagogy that will enhance students' acquisition of practical skills through activity-based instruction where students are given opportunities to be more active in the class. The teacher is expected to plan his lesson properly by carefully choosing the objectives of the lesson, devising ways to make the learners participate in the learning process in a more responsible way, and selecting the appropriate strategies for teaching and supervision, using multimedia resources as well as determining the appropriate strategies for assessment. Instructional materials are fundamental resources for schools for enhancing instruction, furthering the pursuit of knowledge, and providing experiences of educational significance for class group or for individual students (Adewoyin, 2015).

A skill is the capability of accomplishing a job with precision and certainty, practical knowledge in combination with the ability, cleverness, and expertness (Abdullahi, 2010). Similarly, Okorie and Ezeji (2016) remark that to possess a skill is to demonstrate the habit of acting, thinking, or behaving in a specific activity in such a way that the process becomes natural to the individual through repetitive practice. Skill acquisition is the process by which individuals are expected to learn and continuously practice a particular task till the learner becomes proficient in the operation and can perform it when required (Bakare, 2010). Assessment can be defined as the process of gathering on-going and comprehensive information about specific aspect of a Childs knowledge, behavior, skill level, or personality for making evaluative decisions (Blankeship, 2017)

Objectives of the Study

This study aimed at assessing teachers' use of practical lessons for skill acquisition in the electrical and electronics trade at the technical colleges of Kano State Nigeria. Specific objectives of the study include:

1. Determine the lesson planning skills adopted by electrical and electronics teachers in technical colleges in Kano State, Nigeria.
2. 2.Ascertain the lesson implementation skills adopted by electrical and electronics teachers in technical colleges in Kano State, Nigeria.
3. Find out the lesson evaluation skills adopted by electrical and electronics teachers in technical colleges in Kano State, Nigeria.

Research Questions

The study was guided by the following research questions:

1. What are the lesson planning skills adopted by electrical and electronics teachers in technical colleges in Kano State, Nigeria?
2. What are the lesson implementation skills adopted by electrical and electronics teachers in technical colleges in Kano State, Nigeria?
3. How do electrical and electronics teachers in technical colleges in Kano State, Nigeria, impact on students' learning outcomes?

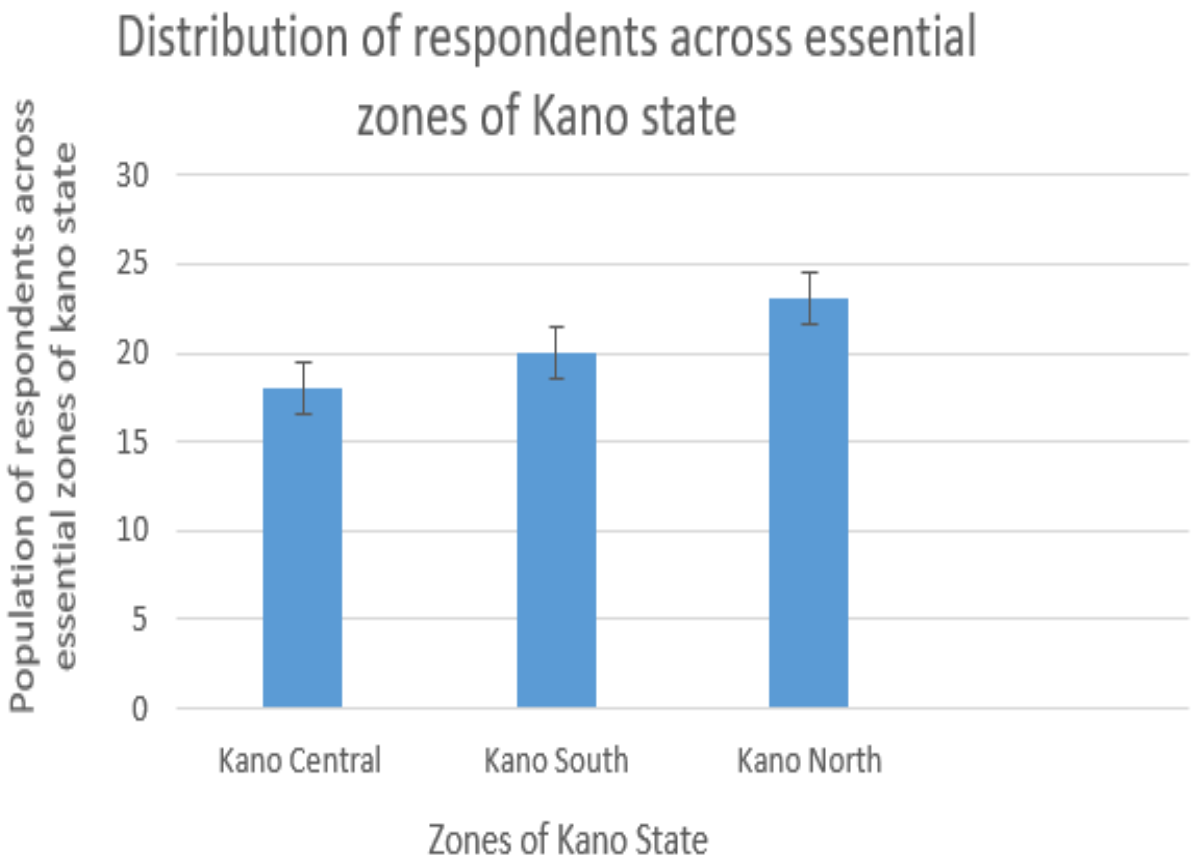
Theoretical Framework

Theory, according to Inuwa (2014), is a series of related statements that are arranged to give functional meaning to a set or series of events. The set of related statements may take the form of descriptions or functional constructs, assumptions, postulations, laws, and theories, such as the theory of instruction and management. The theoretical framework of this study is based on the theory of skill acquisition. In the work of Richard (2011), the theory of skill, or skill acquisition, stated that skills are essential in all technical occupations or professions, sports, or athletics. A skill, according to Inuwa (2011), is an individual's capacity to control elements of behavior, thinking, and feeling within specified contexts and within particular task domains (Inuwa, 2014). Skill acquisition through the hierarchical coordination of lower-level action systems into higher-order structures: skills develop through a series of four broad tiers, each of which comprises four levels and an indefinite number of steps within levels. This produces a total of 13 levels of skill acquisition with an indefinite number of steps between levels (Richard, 2011).

Methodology

A descriptive survey research design was adopted for the study. In the view of Richard

(2011), survey research is a method of data collection through interviews and direct observation to ascertain the opinions, attitudes, perceptions and preferences of individuals under study. The study population comprises 60 electrical/electronic teachers in technical colleges across the three senatorial zones of Kano State, Nigeria, which are: Kano Central, Kano South, and Kano North. The entire population was used. The questionnaire, which consisted of twenty-seven (27) items, was structured using a four-point rating scale with response choices that range from Strongly Agree (SD), Agree (A), Strongly Disagree (SD), Disagree (DA). The data obtained from the questionnaire were analyzed using Cronbach's Alpha which gave an index 0.72. Descriptive statistics such as mean and standard deviation were used to answer the research questions.



Results

Research Question 1

What are the lesson-planning skills adopted by electrical and electronics teachers in technical colleges in Kano State, Nigeria?

Table 1: Mean and Standard Deviation on The Lesson Planning Skills Adopted by Electrical Teachers in Technical Colleges in Kano State, Nigeria.

S/N	Item	$\bar{X}$	SD	Remark
1	Choosing clear Objectives of the Lessons	3.25	0.96	Agreed
2	Providing appropriate teaching aids	3.10	1.19	Agreed
3	Selecting appropriate assessment techniques	3.25	0.96	Agreed
4	Organizing practical lessons	3.75	0.58	Agreed
5	Selecting Lesson content	3.03	1.13	Agreed
6	Time management	3.42	0.99	Agreed
7	Keeping lesson content	3.75	0.58	Agreed
8	Incorporating lesson record	3.25	0.96	Agreed
9	Choosing the right teaching aids	3.92	0.26	Agreed

Table 1 shows that all these items have a grand mean values ranging from 3.03-3.92, this indicates that the grand mean of each item was above 2.50 which was the mean cut off point on the fur-point rating scale for the lesson planning skills adopted by electrical and electronics teachers.

Research Question 2: What are the lesson implementation skills adopted by electrical teachers in technical colleges in Kano State?

Table 2: Mean and Standard Deviation on The Lesson Implementation Skills Adopted by Electrical and Electronics Teachers in Technical Colleges in Kano State, Nigeria

S/N	Item	$\bar{X}$	SD	Remark
1	Using appropriate tools and equipment	3.17	1.02	Agreed
2	Supervising and guiding the students	3.10	1.19	Agreed
3	Using modern resources	3.42	0.99	Agreed
4	Evaluating students learning outcomes	3.60	0.87	Agreed
5	Explaining concept clearly	3.46	0.92	Agreed
6	Selecting appropriate assessment techniques	3.75	0.58	Agreed
7	Relating the lesson to the current industry	3.25	0.96	Agreed
8	practices	3.17	1.02	Agreed
9	Providing safety rules and precautions	3.60	0.87	Agreed
	Using multimedia resources			

Table 2 shows that all these items have a grand mean value ranging from 3.10-3.75. This indicates that the grand mean of items was above 2.50 which was the mean cut off point on the four-point rating scale for the lesson implementation skills adopted by electrical and electronics teachers.

Research Question 3: How do Electrical and electronics Teachers in Technical Colleges in Kano State, Nigeria, impact Students' Learning Outcomes?

Table 3: Mean and Standard Deviation on the Impact of Students Learning Outcomes by Electrical and Electronics Teachers in Technical Colleges in Kano State, Nigeria

S/N	Item	$\bar{X}$	SD	Remark
1	Lesson planning and implementation	3.10	1.19	Agreed
2	Practical and workshop training	3.17	1.02	Agreed
3	Use of teaching methods	3.82	0.61	Agreed
4	Teacher professional competencies	3.92	0.26	Agreed
5	Fostering learning attitudes	3.10	1.19	Agreed
6	Collaboration and peer learning	3.82	0.61	Agreed
7	Inclusiveness and equity	3.46	0.92	Agreed
8	Motivation and guidance	3.60	0.87	Agreed
9	Assessment and feedback	3.92	0.26	Agreed

Table 3 shows the result of the analysis to answer research question 3 presented in table. The result of the data presented above shows that all items have a grand mean value ranging from 3.10-3.92. This indicates that the grand mean of the items was above 2.50 which were the mean cut off point on the four-point rating scale for the impact of students learning outcomes by electrical and electronics teachers.

Discussion of Findings

The study assessed electrical and electronics teachers' lesson planning, implementation, and evaluation of practical skills in technical colleges in kano state, Nigeria. The study revealed that the lesson planning skills adopted by electrical and electronics teachers it is essential for teaching. Adewoyin (2014), found that the teacher is expected to plan his lesson properly by carefully choosing the objectives of the lesson, devising ways to make the learners participate in the learning process more responsibly, and selecting the appropriate strategies for teaching and supervision, using multimedia resources as well as determining the appropriate strategies for assessment. Kennedy (2018) also revealed that teaching method could be

regarded as the process and procedure adopted by the teacher to guide and prepare students through an organized and planned learning activity to accomplish educational goals.

The study revealed the lesson implementation skills adopted by electrical and electronics teachers. National Board for Technical Education [NBTE] (2001), which found that technical teachers are expected to evaluate students' learning outcomes, selecting appropriate assessment techniques for students to work with tools, equipment, and machines to install wiring, perform basic electrical operations, construct circuits, and complete electrical installations in the industry.

The findings of the study revealed the impact on students of the learning outcomes by electrical and electronics teachers. Olaitain (1996), found that technical and vocational education in Nigeria, particularly regarding the evaluation of electrical teachers and the facilities needed for effective instruction. The study by further highlights the need for electrical and electronics teachers to possess adequate pedagogical and technical competence, fostering learning attitudes, inclusiveness and equity to effectively impart skills to their students.

Conclusion

Based on the findings, the study concluded that electrical and electronics teachers in technical colleges in Kano state effectively adopted all the items listed in lesson planning Skills, lesson Implementation skills, and the impact of students on the learning outcomes. From the result of the study, it was discovered that teachers' adoption of these skills contributes to organized and planned learning activities to accomplish educational goals, selecting appropriate assessment techniques, and adequate pedagogical and technical competencies.

Recommendations

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

1. Teachers should continue to plan lessons with a focus on practical skills, industry standards, and emerging technologies.
2. The government, through the Ministry of Education, should provide funding, modern equipment, and training for teachers.
3. School administrators should monitor and evaluate lesson implementation to ensure effective skill acquisition.

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