FUNCTIONALITY OF 21st CENTURY INSTRUCTIONAL FACILITIES FOR TEACHING AND LEARNING ELECTRICAL/ELECTRONIC COURSES IN TERTIARY INSTITUTION IN NIGER STATE

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Abstract
The research assessed the functionality of 21ˢᵗ century instructional facilities in teaching and learning electrical/electronic courses in tertiary institutions in Niger State. The study adopted descriptive survey research design. The population of the study was 710 lectures and students of electrical/electronic technology in five tertiary institutions in Niger State. The sampling techniques used for this study was purposive sampling technique. The sampling size was 75 electrical/electronic lecturers and 200 electrical/electronic students in five tertiary institutions in Niger State. Two research questions formulated and guided the study. Mean and standard deviation were used to answer the research questions while z-test was used to test the null hypotheses at 0.05 level of significance. The findings revealed that most of the instructional facilities for teaching and learning electrical /electronic courses are available, while some are not available. Most of the instructional facilities for teaching and learning electrical /electronic courses are functioning, while some are not functioning. It was recommended that Government should adequately equip the tertiary institutions that offer electrical/electronic technology with modern equipment and facilities for the training of electrical/electronic technologists.

Keywords: Functionality, Instructional Facilities, Electrical/Electronic Courses and Tertiary Institution.

Introduction

Background to the study

The current state of education in Nigeria even in this 21st century leaves much to be desired. This is due to the development in technology, revolution in all areas of our day to day activities. The rate at which technology is advancing in all sectors has called for more concern in the education sector in Nigeria. The current development in the world of work especially the automation of industries shows that some of the facilities for teaching and learning in our education sector in Nigeria are outdated and called for a rapid and total intervention. There is a general neglect and decay of educational facilities at all levels of education in Nigeria occasioned by the long-standing culture of poor funding of education by successive governments in Nigeria. This situation prompted the comment in the editorial in the guardian newspaper by Oni (2019) that there must be something anti-intellectual about the policies and allocation of resources in our country especially under past military governments, sadly, the civilian administrations have not fared any better. Still commenting on the same issue especially in the face of the proposal of the Federal Government to establish six more Federal Universities in Nigeria, according to Oni (2019) in the guardian newspaper observed that: "From the 1990s to date funding of tertiary education has been problematic as successive governments showed marked preference for other priorities and corruption became endemic. Budgetary allocation has declined to the extent that universities and other tertiary institutions are barely able to pay the salaries and allowances of personnel, libraries, laboratories and engineering workshops have long been in decay with the result that most products of the

nation's tertiary institutions lack the intellectual preparation and critical skills required to drive the development process in any sphere of national life".

The Nigerian tertiary institutions of learning are far too ill-equipped to train and develop new graduates suitable for the 21stcentury; their products are mediocre (Ezeji, 2019). Analysis of the situation point to the extreme level of infrastructural as well as pedagogical deficiency in Nigerian Universities, this being the result of underfunding of public universities (Nwakanma,2020). Sanni (2021) while commenting on the Nigerian content Act passed in 2010 to regulate the activities of the Nigerian content division of the Nigerian National Petroleum Corporation (NNPC) lamented that so far, the effect of the law is not yet felt in Nigeria. This is because the International Oil Companies (IOCs) are reluctant to comply with it. They complain that Nigerian graduate engineers required in the industry do not have the basic engineering knowledge and skills largely due to inadequate training in the universities. While decrying the poor state of education in Nigeria and the resultant effect on Nigeria, Ibrahim (2019) lamented that Nigeria was losing quite a huge sum of foreign exchange because of applicants seeking foreign university education. He hereby gave a comparison of universities in Nigeria and Britain, noting that in an average British university, all facilities are available for research with libraries having the latest books on different subjects unlike in Nigeria. (Oni, 2019).

Tertiary Education, as adopted in the Federal Republic of Nigeria (2014) means Universities, Polytechnics, and Colleges of Education. By design, tertiary education is supposed to promote knowledge, provide solutions to national problems, and ultimately assist the society to achieve its aim of human and socio-economic development in all sectors (Oluwatoyin, 2020). To achieve these ideals, tertiary education must operate a semblance of symbiosis with other sectors, and institutions in the nation (Nwakanma, 2020). That is, it is important that policies are made, and that these policies are considerate of the current socio-economic realities of the society, Nation and the world at large to facilitate successful execution. Governments increasingly understand that the entire educational system from early childhood through tertiary education must reflect the new social and economic needs of the global knowledge economy, which increasingly demands a better-trained, more skilled, and adaptable workforce (Oranu, 2021). One of the best education systems to fulfilled the aim, goal and objective of Federal Republic of Nigeria as stated in the National policy of education is the technical/technology education. Tertiary institution where technical and vocational education and training (TVET) can provide an effective and efficient complement to traditional university studies in providing students with skills and knowledge relevant to the labour market (Olalekan, 2018). Tertiary institutions offering technical and vocational education and training (TVET) programs provide courses in electrical and electronic engineering.

The teaching and learning of electrical/electronic courses involve imparting information to the learner and the acquisition of scientific knowledge, ideas, facts, skills and other relevant data arranged in the technical information for the electrical/electronic learner's academic and mental development. Teaching is the science and art of helping a person to learn. Technically, teaching involves assisting the learner to develop insight into a problem or to form an association between a response and a stimulus. According to Ogwo and Oranu (2019) teaching is a partnership enterprise between the teacher and the students which ultimately leads to permanent changes in the behaviour of the students. The teaching and learning of electrical/electronic courses to a great extent depends on the adequate provision and utilization of instructional facilities in the teaching of the subject. Instructional facilities are the essential concrete features that enable the electrical/electronic lecturers/instructors teach effectively in the electrical/electronic workshop and lecture theatre (Okoro, 2021; Oranu, 2021).

Instructional facilities which include; buildings, machines, workbenches, equipment, tools and materials for a major place and resources which electrical/electronic lecturers manipulate in other to cause learning to occur. This implies that instructional facilities are those items which the electrical/electronic lecturer turns to for help in his goal of seeking activities that would help him perform the job of instruction.

According to Larson, (2022) whatever the lecturer uses as aid in order to teach a lesson could be referred to as instructional facility. Instructional facilities in teaching of electrical/electronic courses help the lecturers to convey intended messages effectively so that learner receives, understands, retains and applies experience gained to reach overall educational goals. Facilities could also be described as tools. In Nigeria, tools in industrial technical education are grouped together, and they include; saws, pliers, files, chisel, screws drivers, among others, which are also classified as hand tools. The lathe, pillar drills, grinders, power saw, combination plier, rolling, shaping and milling machines are classified under machine tools, while some other materials include; steel rods, wires, wood and cement. These facilities help actualize instructions in electrical/electronic lecture theatre and workshop (Ibrahim, 2019). The realization of the objectives of and the ability to improve student achievement depend on a number of factors. These include the availability of equipment, tools, and materials, and adequate supply of lectures, the proper implementation and often utilization of instructional facilities (Umunadi, 2020). Awobodu, (2020) has noted that lecturer's utilization of relevant facilities, material and tools in teaching electrical/electronic courses facilitates learning and enhances students' achievement. The provision and availability of instructional facilities could be accomplished through compliance to various recommendations by organizations, bodies and commissions that create standards. The National University Commission (NUC 2017) recommended a specified number of each of the facilities, tools, equipment and machinery for a specified number of students intended for admission in academic year for electrical/electronic in tertiary institutions. This recommendation by NUC means that facilities should be given consideration in the initial planning of the course programme. The NUC also emphasized that a provision of these instructional facilities less than the number specified in the tertiary institutions would be classified as inadequate and the provision of instructional facilities that matches with the number specified in the tertiary institution would be classified as adequate. According to Asilokun (2022), the availability of adequate electrical/electronic facilities enhances students' learning by allowing them to be involved in demonstrations, and practice will continue to build their skills.

For effective instructions and attainment of skills, the instructional facilities should be modern and functional, so that the lecturer and learner could benefit from it (Ololube, 2018). Also, according to Ajayi (2020), for electrical/electronic graduates to be effective and gainfully employed, there must be available and functional tools and equipment (facilities) to offer electrical/electronic trade in tertiary institution. The author further stressed that, courses lacking facilities or tools for proper teaching and learning should not be offered at all in tertiary institutions, therefore, the saying half bread is better than none, does not work in acquisition of skill and knowledge. This means that there is need for functional facilities that should be a replica of what is obtainable and relevant to the occupation/trade, which the student should appreciate their importance.

Functionality is concerned with making instructional facilities to serve educational purposes in the school for teaching and learning under the best condition and effectively utilized. Utilization of available and functional instructional facilities in teaching electrical/electronic courses promotes meaningful communication enhances effective teaching, increases the

interest of learners and motivate individualized instruction in which learning is assured. This implies that, the ultimate goal of utilizing instructional facilities is to facilitate teaching and learning (Okoye, 2018).

To achieve self-reliant and gainful employment, serious attention should be given to the availability and functionality of instructional facilities. Hence, the assessment of availability and functionality of instructional facilities in teaching and learning electrical/electronic courses in tertiary institutions in Niger State, Nigeria become imperative in this 21st century.

The 21st Century is best described as the age of science and technology, exploration, experimentation and development. This has resulted to innovations in all fields of human endeavour with its attendant socio-economic consequences. Thus, every nation must be abreast with such innovations to be economically viable. In view of this, Oranu, (2021) opined that Nigeria needs to grow and compete favorably with other nations in business and industry, in new methods and new techniques. This requires not only capital investment, but also a workforce that is knowledgeable and has the flexibility to acquire new skills for new jobs as the structures of the economy and occupations change. The search therefore, is for skilled workers and specialists in new and growing fields such as Technical Education. Training in vocational and technical education is primarily meant to equip the trainee with skills, knowledge and attitude to become self-reliant, enterprising and ready to create environment for self and societal empowerment. The flexibility and productivity of any workforce largely depends on the availability of skilled workers especially technologist, technicians and artisans.

Statement of the Research Problem

The goal of electrical/electronic programmes in Nigerian tertiary institution is to produce qualified electrical/electronic manpower with sound theoretical and practical knowledge that can perform all kinds of electrical/electronic works and diagnose, on electrical devices to the manufacturer's specification in the 21st century. The electrical/electronic graduates in tertiary institution in Niger State, Nigeria have the prospect of either being employed in industries, or setting-up their own business, becoming self-employed or furthering their education to post graduate level. The above can also be fusible when the facilities in tertiary institutions are available, adequate, functional and utilized. The government at different level had made several attempts and contributions towards the provision of facilities in electrical and electronics in tertiary institution. Also, research has being conducted by different researchers on the availability and functionality of facilities and strategies for improving electrical and electronic facilities for teaching and learning.

Okoye (2018) stated that the functionality of instructional facilities in tertiary institutions refers to their effectiveness and suitability for supporting teaching, learning, research, and other academic activities in tertiary institutions. Here are some key aspects of their functionality: Supporting Teaching and Learning: Instructional facilities should provide appropriate spaces and resources for lectures, seminars, workshops, and other forms of instruction. This includes well-equipped classrooms, lecture halls, and specialized facilities for hands-on training in disciplines like laboratories, studios, and workshops; Enabling Research: Tertiary institutions often engage in research activities. Adequate facilities such as research laboratories, libraries with comprehensive collections, and access to digital resources are essential to facilitate research endeavours; Promoting Practical Application: Facilities should allow for the application of theoretical knowledge through hands-on experiences. This could involve specialized equipment, simulated environments, or spaces for conducting experiments and projects; Facilitating Collaborative Learning: Spaces for group discussions, study rooms, and

project work areas encourage collaborative learning, fostering teamwork and problem-solving skills among students; Accommodating Technological Needs: Given the increasing reliance on technology, instructional facilities should be equipped with up-to-date computer labs, audio-visual equipment, and internet connectivity to facilitate modern teaching methods and research; Ensuring Safety and Accessibility: Facilities should be designed with safety measures in place and be accessible to all, including individuals with disabilities. This includes ramps, elevators, and other accommodations. The functionality of instructional facilities is crucial for providing a high-quality education and fostering a stimulating learning environment in tertiary institutions. Regular assessment, maintenance, and investment in these facilities are necessary to meet the changing demands of education.

However, these graduates of electrical/electronic technology prove to be ill equipped as most companies and industries spend money in training and retraining the graduates of electrical/electronic in tertiary institutions in Niger State, Nigeria in other to meet the standard required by the companies and industries, instead of starting work immediately (Adesina, 2018).

Niger State is also characterized with high level of unemployment, making majority of graduates including graduates of electrical/electronic technology to roam about and get involved in various criminal activities. According to Olalekan (2018) unemployment among electrical/electronic graduates can be attributed to several factors: Skill Mismatch; Lack of Experience; Economic Downturn and industrial revolution, most of the unemployed graduates are idle and restive. Consequently, these idle graduates devise alternative means to earn a living. Most graduate of electrical/electronic are still unemployed especially in this 21_{st} century, therefore there is need to carry out research on the functionality of that equipment and the level at which the equipment have being used if they are available. The instructional materials should be updated to meet up with the current state of technology revolution and innovation.

The graduates from tertiary institutions offering electrical/electronics should be equipped with necessary and right instructional materials. They should be equipped with modern electronic components, testing equipment, and tools (Awobodu, 2020). According to Okoye (2018) computer Labs are important for software simulations, programming, and design work related to electrical and electronic systems, workshop space are essential for practical skills development, including wiring, soldering, and assembly of electronic circuits, a comprehensive collection of textbooks, journals, and electronic resources specific to electrical and electronic engineering should be made available. It's important for institutions to regularly update and maintain these facilities to keep up with technological advancements and industry standards. Additionally, faculty expertise and ongoing professional development play a critical role in ensuring effective utilization of these resources. Government has been spending money to ensure that these facilities are available base on the researches carried out and the effort of the government still. Most of the graduate of electrical/electronic cannot be self-employed in this 21_{st} century skills, therefore there is need to carryout functionality on these facilities and the level if at all they are available. It is therefore base on this ground that the researcher intends to evaluate the availability, functionality and utilization of instructional facilities for teaching and learning electrical/electronic courses in tertiary institutions in Niger state. This intends to investigate the functionality and utilization of instructional facilities in teaching and learning of electrical/electronic courses in tertiary institution in Niger State, Nigeria.

Purpose of the Study
The purpose of this study was to evaluate the functionality and utilization of instructional facilities in teaching and learning of electrical/electronic courses in tertiary institution in Niger State, Nigeria. The specific purpose of the study was to:
1. Determine the availability of the 21st century instructional facilities for teaching and learning electrical/electronic courses in tertiary institution in Niger State, Nigeria.
2. Determine the functionality of the available 21st century instructional facilities in teaching and learning electrical/electronic courses in tertiary institution in Niger State, Nigeria.

Research Questions
The following research questions guided the study.
1. What are the available instructional facilities for teaching and learning electrical/electronic courses in tertiary institutions in Niger State?
2. What are the adequacies of instructional facilities for teaching and learning electrical/electronic courses in tertiary institutions in Niger State?

Research Methodology
The descriptive survey research method with the use of a structured questionnaire was used to collect the required information from the respondents. The survey research was adopted because survey design generally can be used to effectively investigate problems in realistic settings. Nworgu (2018) described survey research as that which a group of people or items is studied by collecting and analyzing data from only a few people or items considered to be representative of the entire group.

The study was carried out in Niger State, a state in central Nigeria and the largest state in the country which shares boundaries with Kaduna State (North-East), Federal Capital Territory (South-East), Kebbi State (North-West), and Kwara State (South-West). This study covers five tertiary institutions offering electrical/electronics in Niger State. The following are the tertiary institutions: Federal University of Technology Minna; Niger State College of Education Minna; Federal polytechnic Bida; Institute of technology and Innovation Minna; Niger State Polytechnic Zungeru.

The targeted population for this study comprises of 710 lecturers and students of electrical/electronic technology in 5 tertiary institutions in Niger state. Total sampled for the study is 275, consisting of 75 electrical/electronic lecturers and 200 electrical/electronic students. Simple random techniques were used to select 200 level students from 5 tertiary institutions and all electrical/electronic lecturers were used from all the 5 tertiary institutions, purposive sampling technique was used to select 40 students in each institution among 200 level students. This was carried out to enable the researcher select experienced and active lecturers and students for the study.

The instrument used for data collection is questionnaire. The questionnaire is to determine the opinion of the respondents that comprises of electrical/electronic lecturers and electrical/electronic students in tertiary institutions in Niger Stata. technical colleges in Niger State. The questionnaire is divided into two parts (i and ii). Part i consist of respondents "personal data", containing information about gender, age, categories, qualification and part ii is grouped into (A and B) where section A consist of 16 items which sought to elicit information on the available instructional facilities for teaching and learning electrical/electronic courses in tertiary institutions in Niger State, section B consist of 16 items which sought to elicit

information on the functionality of instructional facilities for teaching and learning electrical/electronic courses in tertiary institutions in Niger State.

The instrument use for data collection was administered to all the five tertiary institutions offering electrical/electronic programme. The instrument was retrieved immediately for computation. The instrument for data collection was administered by the researcher and research assistance. The data collected by the researcher was analyzed using mean, standard deviation as statistical tools. A four-point rating scale was employed with the following response: Highly Available (HA), Available (A), Moderately Available (MA) and Not Available (NA) and Highly Function (HF), Function (F), Moderately Function (MF) and Not Function (NF). The data collected for the study was organized and analyzed on the basis of the research question SPSS version 27 was used for the analysis. Decisions on the research questions were based on the resulting means score interpreted. Any item that its mean is 2.50 and above will be regarded available or functioning while, any items that its mean is less than 2.50 will be regarded as not available or not functioning. The standard deviation was used to decide on the closeness or otherwise of the respondents to the mean in their responses. Any item with standard deviation of less than 1.96 indicated that the respondents were too far from the mean. Independent sample z-test was used to analyzed hypothesis to determine the no significant at $(P<.05)$ level of significance on the functionality of electrical/electronic instructional facilities used for teaching in tertiary institutions in Niger State.

Presentation and Data Analysis

This chapter deals with the presentation and analysis of data with respect to the research questions formulated for this study, the result of this data analysis for the research questions are presented.

What are the available 21st century instructional facilities for teaching and learning electrical/electronic courses in tertiary institutions in Niger State?

Table 4.1: mean response of electrical/electronic lecturers and electrical/electronic students on the available instructional facilities for teaching and learning electrical/electronic courses in tertiary institutions in Niger State. $N_1=75$, $N_2=200$.

4.1 Research Question 1

SN	ITEMS	X_1	SD1	X_2	SD2	X_t	R
1	Laboratories	2.21	0.81	2.53	0.68	2.37	NA
2	Computer Labs	3.53	0.72	3.76	0.52	3.65	A
3	Workshops	3.53	0.72	3.76	0.52	3.65	A
4	e-library	3.54	0.67	2.83	0.47	3.19	A
5	Specialized software	2.05	0.53	2.43	0.51	2.24	NA
6	Tools and equipment	3.50	0.64	3.9	0.40	3.75	A
7	Lecture theatre and classrooms	3.48	0.71	3.17	0.30	3.33	A
8	Safety equipment	3.22	0.91	3.05	0.51	3.14	A
9	Internet connectivity	2.19	0.64	2.42	0.68	2.30	NA
10	Prototyping Facilities	2.37	1.10	2.59	0.69	2.48	NA
11	Access to industrial partnership	2.72	0.79	2.35	0.40	2.54	A
12	Test and measuring instrument	2.70	0.81	2.51	0.68	2.61	A
13	Power supply	2.98	0.51	2.72	0.53	2.85	A
14	Audio-visual aids	3.28	0.47	2.94	0.67	3.11	A
15	Electronics labs	3.38	0.64	3.02	0.40	3.20	A
16	Argumentation/visual reality	2.57	0.53	2.31	0.47	2.44	NA

KEY: $X1$= mean of lecturers, $X2$= mean of students, N1= number of lecturers, N2= number of students, SD1= Standard Deviation of lecturers, SD2= Standard Deviation for students, Xt= Average mean of both lecturers and students, R= Remark, NA= Not Available, A= Available.

Table 4.1 reviewed that the respondents agreed with item 2, 3, 4 6, 7, 8, 11, 12, 13, 14, and 15 with the mean ranges between 2.54 to 3.75 which is above 2.50. this indicated that the respondents agreed that the listed instructional facilities ae available in tertiary institutions in Niger State. While items 1, 5 9, 10, and 16 with the means ranges between 2.24 to 2.48 which is less than 2.50 this indicated not available. This means that the responses of the respondent show that the instructional facilities are not available for teaching electrical and electronics programme in tertiary institutions in Niger State. The standard deviation is between 0.40 to 1.10 which is below 1.96 indicating that the responds are not too far from each other.

Research Question 2

Are instructional facilities for teaching and learning electrical/electronic courses in tertiary institutions in Niger State functioning?

Table 4.3 Mean responses of electrical/electronic lecturers and electrical/electronic students on the functionality of instructional facilities for teaching and learning electrical/electronic courses in tertiary institutions in Niger State. N1= 75, N2=200

SN	ITEMS	X1	SD1	X2	SD2	Xt	R
1	Laboratories	2.62	0.38	1.89	0.82	2.26	NF
2	Computer Labs	2.69	0.44	3.41	0.93	3.05	F
3	Workshops	3.52	0.58	3.04	0.64	3.28	F
4	e-library	2.43	0.93	2.19	0.90	.2.31	NF
5	Specialized software	2.21	0.50	2.11	0.67	2.16	NF
6	Tools and equipment	3.17	0.62	2.74	0.80	2.96	F
7	Lecture theatre and classrooms	2.86	1.05	3.02	0.87	2.93	F
8	Safety equipment	2.59	0.93	2.72	0.98	2.66	F
9	Internet connectivity	2.36	0.75	1.98	0.99	2.17	NF
10	Prototyping Facilities	2.21	0.93	1.89	0.99	2.05	NF
11	Access to industrial partnership	2.47	0.50	2.74	0.67	2.61	F
12	Test and measuring instrument	2.88	0.85	3.21	0.92	3.05	F
13	Power supply	2.56	0.57	3.11	1.72	2.84	F
14	Audio-visual aids	2.92	0.75	2.58	0.99	2.75	F
15	Electronics labs	2.65	0.57	3.05	0.99	2.85	F
16	Argumentation/visual reality	1.88	0.85	2.62	0.92	2.25	NF

KEY: $X1$= mean responses of lecturers, $X2$= mean responses of students, N1= number of lecturers, N2= number of students, SD1= Standard Deviation for lecturers, SD2= Standard Deviation for students, Xt= Average mean of lecturers and students, R= Remark, F= Functional, NF= Not Functional.

Table 4.2 reviewed that the respondents agreed with item 2, 3, 6, 7, 8, 11, 12, 13, 14, and 15 with the mean ranges between 2.61 to 3.28 which is above 2.50 indication that the instructional facilities for teaching and learning electrical/electronics courses are functioning. While items 1, 4, 5, 9, 10, and 16 with the mean ranges between 2.05 to 2.31 which is less than 2.50 indicating that the respondent revealed that the instructional facilities for teaching and learning electrical/electronics courses are not functioning in tertiary institutions in Niger State not

functioning. The standard deviation is between 0.38 to 1.72 which is below 1.96 indicating that the responds are not too far from each other.

Findings of the study

The following are the principle findings of the study; they are organized based on the research questions and hypothesis.

4. Eleven (11) of the listed instructional facilities are available in teaching and learning electrical/electronic courses in tertiary institutions in Niger State. While, five (5) of the instructional facilities are not available for teaching and learning electrical/electronic courses in tertiary institutions in Niger State

5. Ten (10) of the listed instructional facilities are functional in teaching and learning electrical/electronic courses in tertiary institution in Niger State. While, six (6) of the instructional facilities are not functional in teaching and learning electrical/electronic courses in tertiary institution in Niger State.

Discussion of the Findings

The discussion of findings is based on the research questions posed for the study. The findings in research question 1shows that majority of the instructional facilities listed for teaching and learning electrical/electronic courses in tertiary institutions in Niger State are available. The responses of the electrical and electronics lecturers and students regarding the availability of instructional facilities for teaching and learning electrical/electronic courses in tertiary institutions are: Computer Labs, Workshops, e-library, Tools and equipment, Safety equipment, Lecture theatre and classrooms, Access to industrial partnership, Electronics labs among others. Teaching and learning of electrical and electronics courses at every levels of education require several instructional facilities if the aims and objectives of electrical and electronics programme should be achieved. The findings is in line with the work of Tom (2017) who agree that Safety equipment, Internet access, Access to industry partnership are some of the available instructional facilities in teaching and learning electrical/electronic courses in tertiary institutions. Also, the study of Chuwumezie (2018) concord that availability of instrument for test and measuring various electrical parameters, audio-visual aids, power supply and electronic labs are also the available instructional facilities in teaching and learning electrical/electronic facilities in tertiary institutions. The study is in line with the study of Yisa, et al, (2022) who revealed that workshop, equipment and tools are available and adequate for teaching and learning. The above available instructional facilities show that the government and the school management are committed, but the question remains are the above-mentioned instructional facilities meet up with the current development in terms of technology revolution?

The study also, revealed that some of the instructional facilities for teaching and learning electrical courses in tertiary institutions in Niger State are not available. The respondent noted that the following instructional facilities are not available: Specialized software, Internet connectivity, Prototyping Facilities, Argumentation/visual reality. The above instructional facilities are mostly related to the 21st century facilities. unfortunately, they are not available in our tertiary institutions for teaching and learning electrical and electronics courses in Niger State. This agrees with the study of Yisa, et, al, (2022) who in their study revealed that the ICT materials resources are not available and not adequate at technical colleges in Niger State. This is an indication that the tertiary institution in Niger State has a long way to go. Because, unavailable instructional facilities are mostly needed in this era of technology development and advancement, electrical and electronics students needs to learned the current and needed skills to met up with the global standard. Yisa, et al, noted further that devices that are commonly used today, such as augmented reality (AR) and virtual reality (VR) headsets are the fresh and new IT innovation. By making these instructional facilities readily available, tertiary

institutions can create a robust infrastructure for teaching electrical and electronics that prepares students for real-world challenges and opportunities in the 21st century.

In respect to the research question two, electrical and electronics lecturers and students agreed that most of the instructional facilities for teaching and learning electrical and electronics course in tertiary institutions in Niger Stata are functioning. The following are some of the instructional facilities that the respondents agreed with that are functioning: Computer Labs, Workshops, Tools and equipment, Lecture theatre and classrooms, Access to industrial partnership, Electronics labs, Power supply. This study is supported by the study of Usman et al, (2021) who revealed that hand tools in electrical/electronics option are functioning.

Moreover, the study revealed that some of the instructional facilities are not functioning, such as: Laboratories, e-library, Specialized software, internet connectivity, Prototyping Facilities, Argumentation/visual reality. It is evident that the non-functional instructional facilities are the most needed and necessary for this 21st era of technology and digital transformation. When we talk about technology development, digitalization, robotic automation and innovation in the world of work and educational system internet connectivity, argumentation or visual reality, specialized software are needed for effective teaching and learning in order to prepare the learners towards the future. The study is in line with the study Usman et al, (2021) who revealed that some of the workshop facilities for teaching industrial and technology education are not functioning electrical/electronics programme inclusive. According to Trumper (2017), Modern instructional facilities, equipped with advanced technology and interactive tools, create dynamic learning environments that engage students and facilitate active learning, fostering deeper understanding and retention of course material. Umunadi (2020), agrees that Instructional facilities offer diverse learning spaces tailored to different learning styles and preferences, accommodating both traditional classroom instruction and alternative teaching methods such as experiential learning, project-based learning, and flipped classrooms.

Conclusion and Recommendations

Conclusion

As a result of the findings of the study, the desire to produce competent graduates of electrical/electronic technology can be achieved when the instructional facilities in each tertiary institution are relevant, and functioning for the programme as demanded by the curriculum. It is revealed that some of the instructional facilities that are mostly needed and necessary for the 21st century is not available and not functioning for teaching and learning in tertiary institutions in Niger State. Hence, the call for immediate provision of functioning instructional facilities and training and retraining of electrical/electronic lecturers on the utilization of instructional facilities in order to meet the goal of electrical/electronic technology

Recommendations

Based on the findings of the study the following recommendations are made:

1. National University Commission and other bodies regulating the activities of the tertiary institutions should make sure that instructional facilities are made available before accredited to offer electrical/electronic courses.
2. Obsolete and faulty instructional facilities should be replaced or repaired as the case may be.

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