TIMBOU-AFRICA PUBLICATION INTERNATIONAL JOURNAL MAY, 2024 EDITIONS.

INTERNATIONAL JOURNAL OF EDUCATIONAL RESEARCH AND LIBRARY SCIENCE
VOL. 4 NO. 8 E-ISSN 3026-8478 P-ISSN 3027-186X

EVALUATION OF ELECTRICAL/ELECTRONICS TRADES IN TECHNICAL COLLEGES IN BAUCHI STATE, NIGERIA

BANYAMI ISHAYA; PROF. HASSAN BELLO; & PROF. BABAWURO SHU'AIBU

Vocational and Technology Education Programme, Abubakar Tafawa Balewa University, Bauchi, Nigeria.

ABSTRACT

Technical Vocational Education and Training (TVET) is used as comprehensive term referring to those aspects of educational process involving, in additional to general education, the study of technologies and related sciences and acquisition of practical skills, attitudes, understanding, and knowledge relating to occupation in various sectors of economic and social life. This study focuses on Evaluation of Electrical/Electronics Trades in

INTRODUCTION

Vocational training has been an interwoven part of the African traditional education, as well as part of the inherited culture and tradition imparted by parents and master craftsmen who were experts of their own skills and vocations, this type of training is referred to as non-formal education system. Before independence in 1960, the desire of the colonial government to train only artisan and middle level technicians had translated into a sizeable number of Technical colleges. Nigeria Government then, organized some forms of vocational technical training in some governmental departments, such as lands and survey training school, marine training school, railway training school (Eze, &Okorafor, 2012). As stipulated in the National Policy of Education (FRN, 2013), stated that TVET should cover the following:

i. Technical Colleges.
ii. Vocational Enterprise institutions (VEIs).
iii. National Vocational Qualifications Framework. (NVQF).

Technical college curriculum is aimed at providing an opportunity to all learners to acquire relevant knowledge and skills in technical and vocational occupations and to impart in learners positive attitudes toward the world of work (Ado, 2018). the curriculum programmes of Technical Colleges according to (FRN 2013) are grouped into: National Technical Certificate (NTC) which spans over a period of three years, and

Technical Colleges in Bauchi State**.** The study was carried out in Bauchi state, Nigeria. The researcher used four purposes and four research question to guide the study. The study adopted survey research design and total sample population was used in this study. 45 respondents were used in the study comprising of eight principle, 11 head of department, and 26 teachers of Technical Colleges in Bauchi State. The instruments used for the study were structured questionnaire and checklist it was validated by three experts. The reliability coefficients of the instruments were found to be .813 and hence the instrument was found to be reliable. Statistical Package for Social Sciences (IBM SPSS) version 22 was used to analyze the data collected. The major finding of the study were discovered as such; the objectives are needed for effective training of electrical/electronics trades in technical college, most of the human resources used for teaching electrical/electronics trades students are not adequately available in Technical Colleges in Bauchi State, most of the physical resources used for teaching electrical/electronics trades students are adequately available in Technical Colleges in Bauchi State, the most needed workshop materials for training electrical/electronics trades students are not adequately available in Technical Colleges in Bauchi State. The researcher recommends as follows; there should be actualization of the objective, not only in electrical/electronics trades training in technical colleges but in graduate live long so that it will help them in future, Donor agencies should be encouraged to assist in the provision of these necessary materials for training to take place and minimizing the inadequacies of the Electrical/Electronics trades materials in Vocational and Technical Education in the state.

Keywords: Electrical/Electronics, Trades, Technical Colleges, Bauchi State, Nigeria.

Advanced National Technical Certificate (ANTC) which last one year National Board for Technical Education, (NBTE, 2016).

Electrical/Electronics trades, as they are called, are among the main trade areas offered at technical college level in Nigerian educational system. According to NPE (2013) and Emesini (2016) the programmes that fall under Electrical/Electronics trades include: Appliances Maintenance & Repairs, Electrical Installation and Maintenance Works, Instrument Mechanics Work, Radio, Television and Electronic Serving. The expected skills of electrical and electronics graduates of a technical college (irrespective of their specialization) include measuring and cutting of metals, interpretation of circuit diagrams, carrying out basic Electricity calculations, understanding of the working principles and applications of various Electrical and Electronics devices, troubleshooting of Electrical and

Electronics systems, installation of Electrical and Electronics systems and production of Electrical and Electronics drawing (NBTE, 2016). Okwelle and Okeke (2012) stated that the technical college, Electrical/Electronics trades curricula among others are aimed at training skilled technical manpower equipped with the necessary technical knowledge and practical skills for installing Electrical power systems as well as diagnosing and repairing faults in Electronics systems.

The products of Electrical/Electronics trades students from Technical colleges are prepared to become craftsmen and technicians. The skills they acquired qualify them for jobs in both public and private sectors of economy while the certificate obtained enabled them to further their education (Ibrahim, 2014). Both sectors, according to Haruna, (2013) require well-trained and competent technicians who can operate and maintain the available technical equipment. Some of the products of technical colleges who are opportune to further their education to the university level or its equivalent might eventually become engineers, technologists or technical teachers in their various area of specialization. Availability of facilities enhances students learning by allowing them to be involved in demonstrations and practice that will continue to build their skills and prepare them for the world of work. However most of the technical colleges in Nigeria have been forced to perform below standard due to non-availability, poor management or utter neglect of the required facilities in the workshops for effective training (Yekinni, 2016).

Masaruf, (2015) sees the essence of Electronics curriculum as intended to expose learners to entrepreneurial skills in resource management, marketing, strategic planning and time management skills to help them meet up with the challenges of unemployment, job disliking and poverty. Moreover, to ascertain the success, roles and responsibilities of Electrical/Electronics trades is through evaluation. Evaluation is an integral part of TVET; this is because without evaluation training in vocational skill development will be meaningless (FRN 2013). This agrees very much with goals of TVET which are to provide the technical/vocational college students with practical skills, attitudes, work habits and knowledge essential for employment in a given occupation. Evaluation is the application of systematic methods to address questions about program operations and results. It may include ongoing monitoring of a program as well as one - shot studies of program processes or program impact. The approaches used are based on social science research methodologies and professional standards. Evaluation provides processes and tools that agencies of all kinds can apply to obtain valid, reliable, and credible data to address a variety of questions about the performance of public and non public programs (Ogbuanya, Akintonde, & Bakare, 2017). A program is a set of resources and activities directed toward one or more common goals, typically under the direction of a single manager or management team (Odu, 2013). A program may consist of a limited set of activities in one agency or a complex set of activities implemented at many sites by two or more levels of government and by a set of public, nonprofit, and even private

providers. Increasingly, elected officials, foundations and other nonprofit funders, oversight agencies, and citizens want to know what value is provided to the public by the programs they fund. Members of program staff want to know how their programs are performing so that they can improve them and learn from the information they gather. Executives want to lead learning organization, where staff systematically collect data, learn what works and does not work in their programs, and use this information to improve their organizational capacity and services provided. Program evaluation is presented here as a valuable learning strategy for enhancing knowledge about the underlying logic of programs and the program activities under way as well as about the results of programs (Abdulrahaman, 2013).

Hubert and Stuart 1980 in (Barry, et al, 2011), stated that as human beings acquire a skill through instruction and experiences, they do not appear to leap suddenly from rule-guided (knowing that) to experience-based knowledge how, but there is gradual process involved for an agent to go through in order for him to reach the stage of expertise or knowing-how. Their skill acquisition process shows that a person goes through at least five stages of different knowledge of a specific task and ways of decision-making as he improves his skill. These five states are novice, advanced beginner, competence, proficiency, and expertise

Okolocha, and Baba, (2016), explain why in the recent years, a desire has surfaced to actively recognize a new, role of TVET to achieve national transformation through technical innovations spurred by the advancement in technology and globalization. Turbot, (2012) reiterated that, after a period of neglect, it firmly on the agenda of governments around the world. Youth unemployment, social exclusion and poverty have led many decision-makers to refocus their attention on providing skills development opportunities that respond to evolving social and economic demands. Far from being the weakest link in education systems, it's emerging as a cornerstone for the transformation of education and training. Indeed, the development of skills through which, is now one of the most often-cited priorities by ministers of education in both developing and developed countries. This has drawn the interest of many developing nations like Nigeria to adopt education and TVET in particular as an integral part of national development strategy. Strategic planning is at the core of any successful institutional effectiveness effort which defines the vision and the way forward, but this vision requires execution and management (Alex, 2019).

According to Reko and Maxwill, (2016) Vocational and Technical Education (VTE) systems play a crucial role in the social and economic development of a nation, Owing to their dynamic nature; they are continuously subject to the forces driving change in the schools, industry and society. Mechanized farming requires technical skills that could be obtained in technical and vocational schools through electrical electronic.

Danko, (2016), stated the objectives of vocational education to be preparing learners for entry into employment in his or her chosen career meet the manpower need for the society, increase the option available to each student, motivating force to enhance all. (Kehinde, & Adewuyi, 2015), Vocational and Technical Education (VTE) is fundamental to the development and industrialization of nations. Thus the skills, abilities and competencies that are needed by the nation are embedded in vocational and technical education, which are central to a nation's social and economic emancipation. Consequently, any nation that believes in education as an instrument par excellence for national development has to recognize the significance of vocational and technical education and accord it the desired attention and support that it deserves. It is in this wise that the National Policy on Education places serious emphasis on the development of vocational and technical education for overall development of the nation. However, the much talked about vocational and technical development may not materialize unless the youth develop knowledge, interest, aptitude and manipulative skills required for the construction and production of basic necessities of life. One of the goals of vocational and technical education is to increase the employability of school leavers, regrettably however, due to public prejudices against VTE, that goal seems not to have been realized, which explains the prevalence of poverty, unemployment, prostitution, drug abuse, hunger, violence, insurgency, armed robbery and other forms of social vices in Nigeria today.

Partnership can take place in different forms such as in curriculum development and review, identification of skills demanded by the industry, funding training activities and donation of training facilities and equipment (Rufai, Abdulkadir, & Abdul, 2013). Partnership can also occur in terms of engaging industrial experts in teaching and assessing practical skills, academic staff attachment to industry to get exposure of the world of work (Obwoge, & Nyongesa, 2013) and students internships (Raihan, 2014). These collaborative efforts would enhance the capable of technical institutions to quality training and produce qualified graduates for the labour market.

Effective implementation of technical college modular curriculum needs extra resources and support. At a time of economic recession in Nigeria, the shortage of financial and human resources creates more difficulty for the implementation of technical college curriculum throughout the state. It was observed that Policy objectives are not being met because of the quality and quantity of teachers and instructors to implement the new curriculum. It was also observed that professionalism does not reflect on the teachers or instructors who are to implement the curriculum, and the teachers produced over the years have fallen short of national expectations and needs of the society. Inadequate number of qualified teachers and poorly trained teachers is another problem facing the implementation of technical college curriculum (Samuel, &Yinusa, 2012). Teachers are basic part of educational system as having a vital and decisive role in the quality of

education and how well students learn. There might be seen a general public opinion that relates the level of students' learning to how much they study and do their homework. Nevertheless, students' success in course grades and general exams, in other words their academic achievement can be affected by many factors, effectiveness of teachers in teaching their classes is a very important one of these factors that considered as the most important school related factor in increasing students' performance and success (Miles, 2013). Therefore, it is worthwhile to examine the factors that impact teacher quality or teacher effectiveness and how such factors affect students' academic achievement eventually. The interaction between teachers and students is generally believed to be affected by characteristics of teachers and students. However, there are some other aspects that affect this interaction like the number of students per teacher in a school.

Equipment is uniquely identifiable object that can be installed, maintained separately from building, laboratory or room location, and removed. Laboratory equipment can be described as; various equipment used by scientists working in a mechanical, electrical or chemical laboratory. Laboratory equipment is generally used to either perform an experiment or to take measurements and gather data. Electrical laboratory equipment are equipment used in the training of electrical students, which include DC ammeter, sine wave, AC ammeter, digital and analog oscilloscopes, multitasked, ammeters, voltmeters, ohmmeters, watt meters DC voltmeter, AC voltmeter, rheostats, deflection galvanometer, A.C motors and portable digital multimeter, non-contact tachometer, transformers, cables, circuit breakers and others (Ado, 2018).

The term Electrical Electronics comes from electrons mechanics which means learning the way electron behaves under different conditions of externally applied field. Electronics according to Ezugu, Duhu and Taminu, (2020) means the study of flow of electronics in electric circuits. It is studied as a branch of vocational education to provide youths with gainful entrepreneurial skills, equipping the learners with productive skills. According to UNESCO (2016) Electrical and Electronics trades is to reduce the tide of such challenges facing the youth global financial economics crises, unemployment, job deskilling and poverty.

Electrical/Electronics trades Practice is one of the trades offered in technical Colleges, It is Vocational trade that exposes students to skills. Electrical/Electronics trades Practice is a programme introduced by way of practical exercise, the maintenance of Electrical Electronics system and circuits, electrical Installation, Inspection and test procedure. Electrical craftsmen are expected to test, diagnose, service, install and completely repair any fault on electrical machines and equipment using the manufacturer's manual. In the report of NBTE (2016) the aim of Electrical/Electronics trades Practice is to give training and impart the necessary skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self reliant. Graduates who undergo training in Electrical/Electronics trades are expected to posses work skills for success in

Installation of electrical machines and equipment, maintenance of machines and equipment, winding of Electrical machines, testing and inspection of Electrical Installations, repair of electrical machines,.

Program evaluation can be defined as a systematic operation of varying complexity involving data collection, observations and analyses, and culminating in a value judgement with regard to the quality of the program being evaluated, considered in its entirety, or through one or more of its components, (John, 2017), Evaluation is the means of arriving at a value judgement on the basis of measures (qualitative or quantitative) considered to be valid and reliable, which compare the actual results of a program with its anticipated results. Even where evaluation is concerned with assessing intangible situations, which are difficult to measure, it must, to be credible, be based on data gathered in a rigorous and objective manner (Mccrone, 2019).

A program is a coherent, organized and structured whole, composed of objectives, activities and means. Program evaluation is crucial for determining how, and to what extent, quality improvement systems are effective in educational practices and outcomes, Standards against which program, course objectives, teaching-learning practices, needs and learning outcomes can be assessed and integrated into evaluation system. To do this, besides statistical analysis and documentation processing, qualitative research methods for program evaluation should also be used in order to provide deeper analysis and information. It often helps to think of programs in terms of objectives and resource are the various resources needed to run the program, example money, facilities, customers, clients, program staff, and others. The processes are how the program is carried out, example customers are served, clients are counseled, students are taught, knowledge is delivered, parent associations members are supported, and others. The outputs are the units of service, example; number of customers serviced, number of clients counseled, students taught, research work produced, and employers, community and other groups communicated. Outcomes are the impacts on the customers or on clients receiving services, example; increased employability and job satisfaction of graduates; reputation of the university in society; increased mental health, safe and secure development, richer artistic appreciation, among the staff members (Adrian, 2012).

Hence that, evaluation development of Electrical/Electronics trades, should be based on Electrical/Electronics trades perceived needs, there training methods, techniques, materials and equipments require reflecting the status of art in industry. The ability of graduates to get employment following the completion of education is seen as an indicator of educational effectiveness. The effectiveness of Electrical/Electronics trades in technical colleges is the extent to which graduates are able to find jobs or further there study, enter in the occupation related to the field of training, earn expected income, and are able to use their skills in the place of work.

Statement of the Problem

It has been worrisome to national development with jobless youth of which some of them graduated from one technical college to another, offering various trades among which include Electrical/Electronics trades, most of them seeking employment from public or private organization. Unemployment in Nigeria is a major problem, especially among youth (Samuel &Yinusa 2012). For a country to advance both socially, economically and technologically, its citizens must be productive and creative. It must have a productive citizen majority of which can be job creators rather than job seekers.

Most of technical colleges in Nigeria have force to performed below the standard due to non availability of resource, poor management or utter negligent of the required equipment in the workshop for effective training of the students (Yekinni, 2016). Governments and some agency like NBTE have put some Efforts to promote technical education such that students have necessary skills to be productive without much difficulty, but it have been crippled by lack of necessary courage on the part of the programme to back up training with action. Most technical college institutions have involved in preparing students to become self reliant, but operate using un-check programme, lack of proper training, and inadequate qualified teachers, inadequate funding, poor maintenance culture, etc,. This poor state of programme negatively impacted skills acquisition and competencies of the students. The adverse effect is the production of half baked craftsmen, artisans and technicians in which, they can't be productive after their graduated (Masaruf, 2015). The present study, therefore, intends to Evaluated Electrical/electronics trades in technical colleges in Bauchi state. This is an attempt to offer useful suggestions that would help in finding solution to the problem.

Purpose of the Study

Specifically, the study intended to:

1. Evaluate Electrical/Electronics trades objective in technical college in Bauchi state
2. Fine out the adequacy human resource for Electrical/Electronics trades in technical colleges in Bauchi state
3. Fine out the adequacy infrastructures resource for Electrical/Electronics trades in technical colleges in Bauchi state
4. Fine out the adequacy material resource for Electrical/Electronics trades in technical colleges in Bauchi state

Research Questions

The following research questions were raised to guide this study:-

1. What are the objectives of Electrical/Electronics trades in technical college?
2. How adequate are human resource for Electrical/Electronics trades in technical college in Bauchi state?

3. How adequate are infrastructures resource for Electrical/Electronics trades in technical college in Bauchi state?
4. How adequate are material resource for Electrical/Electronics trades in technical college in Bauchi state?

METHODOLOGY

Descriptive survey design was adopted in this study. The study assess the current position of the Electrical/Electronics Trades facilities for teaching/learning of electrical in Bauchi State's technical colleges. Bauchi is a state located in the northeastern sub-region of Nigeria, occupies a total land area of 49,119 km2 (18,965 sq mi) representing about 5.3% of the Nigeria's total land mass. The target population of the study is made up of 45 respondents which comprised of 8 Principals, 11 HOD (Head of Departments) and 26 teachers, from the eight technical Colleges in Bauchi State. The entire population was used. The instruments were divided into four different sections. Section A was package to elicit information on objective of electrical/electronics trades in technical college. Section B, C, and D sought information on resources for the training of students in Electrical/Electronics trades in technical college level. A checklist obtained from the National Board for Technical Education (NBTE, 2016) minimum standard and a structured questionnaire developed by the researcher were used for the data collection

Copies of the questionnaire were face and content validated by three experts, Two from Department of Vocational and Technology Education, Abubakar Tafawa Balewa University Bauchi, one from school of Vocational and Technical Education Tatari Ali Polytechnic Bauchi. In order to determine the stability (reliability) of the instrument the instrument were subjected to reliability testing. Cronbach's Alpha statistical tool was used to establish the reliability coefficient of the instrument. To establish the reliability of the instrument Kumo Government Technical College in Gombe State was used, the instrument was administered to 12 respondents as a sample but was not involved in the main study. The reliability coefficient of the instrument was found to be .813 and hence the instrument was found to be reliable.

The data collected for study were then analyzed using Statistical Package for Social Sciences (SPSS) version 22 was used to analyze the data that was collected. Therefore, in taking decision, to compute the mean and standard deviation used to answer the research questions one. The decision rule was based on the mean cut-off point of 2.50 which is the agree category. Any item with mean of 2.50 and above was considered agreed and used while an item with a mean below 2.50 was considered disagreed. The checklist data collected for study was analyzed using frequency distribution and simple percentage to answer the research questions one, two and three 65% and above was consider adequate while below 65% was consider inadequate.

RESULTS

The result is presented in order of the research questions as follows.

Research Question One: What are the Objectives of Electrical/Electronics Trades in Technical College?

The data presented in Table 1 revealed that all the items mean values ranged between 2.81 and 3.62. This implied that the responses of electrical/electronics trades teachers in technical colleges in Bauchi States on objectives of electrical/electronics trades were not far from one another they all agreed with the items. The grand mean Objectives of Electrical/Electronics Trades in Technical Colleges is 3.32 which indicated that the respondents agreed with the objectives.

Table 1: Objective of Electrical/Electronics Trades in Technical Colleges. N = 26

S/N	Items		X	SD	Remark
1	Read, interpret, and communicate information		3.42	.504	Agreed
2	Understand career opportunities and working conditions		3.23	.514	Agreed
3	Demonstrate awareness of sustainability		3.42	.504	Agreed
4	Describe sustainable business practices within the electrical trades		3.50	.510	Agreed
5	Demonstrate fundamental employability skills		3.38	.496	Agreed
6	Facilitate students' transition to the electrician trade		3.23	.514	Agreed
7	Try to emulate, as far as possible, a regular workplace		3.42	.504	Agreed
8	Employability skills such as punctuality and time management		3.19	.567	Agreed
9	Cluster prepare the student for certification as a journeyperson electrician		3.23	.765	Agreed
10	Cluster focus on preparing the student for entry-level employment as a electrician after technical college		3.23	.765	Agreed
11	Teacher required to have a Manitoba general teaching certificate		3.23	.710	Agreed
12	Teacher required to have a Manitoba technical vocational teaching certificate		3.27	.667	Agreed
13	Learning objectives influences the planning of workshop facilities		2.81	.749	Agreed

14	Planning of workshop facilities assist in achieving the objectives of the school annually		3.58	.504	Agreed
15	Learning experiences must provide the development of the ability to think		3.62	.496	Agreed
16	Curriculum must based on contain experiences intrinsic to the life of the learner		3.31	.549	Agreed
17	Content in developing entrepreneurial skills in time Management		3.19	.634	Agreed
18	Workshop safety rules and their application in electrical electronics workshop		3.42	.504	Agreed
	Grand Mean		**3.32**		

Source: Fieldwork, 2023

Research Question two: How adequate are human resource for Electrical/Electronics trades in technical college in Bauchi state?

Table 2 shows that human resource input into Electrical/Electronics Trades in technical college in Bauchi state are inadequate with the total percentage of 45.3% for teaching electrical/electronics trades. However, Teachers are adequate with 65.0%, while Instructors and Workshop Technician are inadequate with 26.0% and below, and workshops attendants are not available.

Table 2: Human Resource into Electrical/Electronics Trades in Technical College in Bauchi state

S/No.	Items	F	Percentage (%)	Remarks
19	Teachers	40	65.0	Adequate
20	Instructors	8	12.5	Inadequate
21	Workshop Technician	8	25	Inadequate
22	Workshop Attendants	8	0	Not Available
	Total Percentage		**45.3%**	

Source: Fieldwork, 2023

Research Question three: How adequate are physical resource for Electrical/Electronics trades in technical college in Bauchi state?

Table 3 reveals the availability of physical resource into electrical/electronics trades programme in Bauchi state technical colleges. From table 3, it can be seen that physical resources like Classroom Blocks, Fire Extinguisher, well equipped workshop, Library, Staffroom are inadequate with the less than 56.8% and below, while, staffroom, Toilet, borehole and store provided for the implementation of the programme are adequate

with 68.8% and above. Furthermore, table 3 which show that available of physical resource for teaching and learning of electrical/electronics trades are adequate with the total percentage of 69.9%.

Table 3: physical resource for Electrical/Electronics trades in technical college in Bauchi state

S/No,	Items	F	Percentage (%)	Remarks
23	Classroom Blocks	40	55.0	Inadequate
24	Fire Extinguisher	16	56.8	Inadequate
25	Well equipped Workshop	8	25	Inadequate
26	Library	8	50	Inadequate
27	Staffroom	16	68.8	Adequate
28	Toilet	32	87.5	Adequate
29	Borehole	8	75.0	Adequate
30	Store	8	75.0	Adequate
	Total Percentage		**69.9%**	

Source: Fieldwork, 2023

Research Question four: How adequate are material resource for Electrical/Electronics trades in technical college in Bauchi state?

Table 4: The results revealed that out of the whole 35 items, only 8 items (32, 43, 46, 47, 51, 58, 59, 60, and 62) were considered adequate with the percentage of 65.5 and above. While 27 items, (31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 44, 45, 48, 49, 52, 53, 34, 55, 56, 57, 59, 61, 63, 64 and 65) were consider inadequate with the percentage of 62.5 and below, the table 4 show that material resource into Electrical Installation and Maintenance Work in Bauchi state technical colleges are inadequate with the total percentage of 52.2 based on the minimum guide curriculum and course/module specifications issued by NBTE.

Table 4: Material Resource into Electrical Installation and Maintenance Work in Bauchi State Technical Colleges

S/No.	Items	F	Percentage (%)	Remarks
31	Work bench.	40	50.0	Inadequate
32	Wiring Board's/Wiring Room Simulators	40	65.5	Adequate
33	Conduit Bending Machine	40	43.8	Inadequate
34	Conduit Vice	160	43.8	Inadequate
35	Voltage meter	40	42.5	Inadequate
36	Voltage tester	160	40.6	Inadequate

37	Spirit tester	40	37.5	Inadequate
38	Micro meter	40	42.5	Inadequate
39	Ohm meter	40	52.5	Inadequate
40	Energy meter	160	18.8	Inadequate
41	Overall Uniform	160	37.5	Inadequate
42	Safety Belt	160	62.5	Inadequate
43	Helmet	160	67.5	Adequate
44	Welding and Brazing Equipment	160	56.9	Inadequate
45	First Aid Box	16	62.5	Inadequate
46	Water Buckets	40	90	Adequate
47	Screw driver	40	85.0	Adequate
48	Files	160	51.9	Inadequate
49	Boots	160	43.8	Inadequate
50	Heater (Oven)	160	59.4	Inadequate
51	Cuter	40	72.5	Adequate
52	Handgloves	16	56.3	Inadequate
53	Craw bar	40	35.0	Inadequate
54	Soldering Bit	40	45.0	Inadequate
55	Soldering Iron	40	58.1	Inadequate
56	Goggle	40	47.5	Inadequate
57	Pot and Laddle	40	45.0	Inadequate
58	Blow Lamp	40	95.0	Adequate
59	Tapes	40	62.5	Inadequate
60	Scaffolding	40	87.5	Adequate
61	Ladder	16	50.0	Inadequate
62	Steel rule	40	95.0	Adequate
63	Clamps	160	37.5	Inadequate
64	Techno meter	160	56.3	Inadequate
65	Voltmeter	160	54.4	Inadequate
	Total Percentage		**52.2%**	

Source: Fieldwork, 2023

Table 5: It can be seen from the table that only 13 items out of 45 were consider adequate with 66.0% and above, however 32 items were consider Inadequate with 58.7% and below. Therefore, table 5 revealed that material resource into radio, television and electronic work in Bauchi state technical colleges were Inadequate with total percentage of 43.9% Based on the minimum guide to curriculum and course/module specifications issued by NBTE.

Table 5: Material Resource into Radio, Television and Electronic Work in Bauchi State Technical Colleges

S/No.	Items	F	Percentage (%)	Remarks
66	Multimeter (analog)	60	68..3	Adequate
67	Alignment tools	45	10.0	Inadequate
68	Soldering gun	150	58..7	Inadequate
69	Desoldering device	90	33.3	Inadequate
70	Variable power supply	150	2.0	Inadequate
71	Files	120	68.3	Inadequate
72	Heat sinks	15	53.3	Inadequate
73	Crimping tools	120	58..3	Inadequate
74	Transistor tester	15	66.7	Adequate
75	Electrical tapes	72	41.7	Inadequate
76	Pocket knife	150	60.7	Inadequate
77	Steel-wire brush	45	46.7	Inadequate
78	Pen light	90	11.1	Inadequate
79	solder	30	53.3	Inadequate
80	Transformer (HF)	150	4.0	Inadequate
81	Transformer(LF)	150	12.0	Inadequate
82	Magnetic core inductor	150	5.3	Inadequate
83	Air core inductor	150	2.0	Inadequate
84	Variable capacitor	150	73.3	Adequate
85	Fixed capacitor	150	80.0	Adequate
86	Variable resistor(assorted)	150	72.7	Adequate
87	Component checkers	15	20..0	Inadequate
88	Fixed resistor(assorted)	150	86.0	Adequate
89	Potable Drilling machine	6	50.0	Inadequate
90	Screws (set)	36	41.7	Inadequate
91	Diagonal cutters	120	74.7	Adequate
92	Regular and miniature needle Pliers	120	75.8	Adequate
93	Wire stripper	150	20.0	Inadequate
94	Soldering iron	90	53.3	Inadequate
95	Nut drivers (Hex)	60	68.3	Adequate
96	Screw driver sets	120	75.0	Adequate
97	Illustration colour chart	120	25.0	Inadequate
98	VCR and it monitor	15	20..0	Inadequate

99	Overhead Projector	30	13.3	Inadequate
100	AV equipment	3	33.3	Inadequate
101	Small bench vice	30	36.7	Inadequate
102	Steel bowl	120	7.5	Inadequate
103	Sandpaper	120	84.2	Adequate
104	Multimeter (digital)	150	66.0	Adequate
105	Flashlight	90	36.7	Inadequate
106	Oscilloscope with 6mhz bandwidth	15	26.7	Inadequate
107	Small plastic container	30	33.3	Inadequate
108	Magnifying lens	30	20.0	Inadequate
109	High Input Impedance voltmeter (VTUN or TVM)	30	23..3	Inadequate
110	Volt-ohm-milliameter (VOM)	30	46.6	Inadequate
	Total Percentage		**43.9%**	

Source: Fieldwork, 2023

MAJOR FINDINGS:

1. All the 18 objectives are needed for effective training of electrical/electronics trades in technical college in Bauchi state,
2. Most of the human resources used for teaching electrical/electronics trades students are not adequately available in Technical Colleges in Bauchi State.
3. Most of the physical resources used for teaching electrical/electronics trades students are adequately available in Technical Colleges in Bauchi State.
4. The most needed workshop materials for training electrical/electronics trades students are not adequately available in Technical Colleges in Bauchi State.

Discussion of the Findings

Based on the findings of the study; show that all the electrical/electronics trades objective in technical colleges are needed , for students to buy in and understand that electrical/electronics trades learning environment will enables them gain knowledge and skills so they can stand out in future. This finding is in line with that of James, (2015) who reported that twenty objective through which the programme of electrical and Electronic have been achieved and improved in Ebonyi State technical colleges in Eastern Nigeria. Similarly Rachel, et al, (2018) revealed that a larger proportion of the objective are to guide students contributed positively to societal growth and to have confidence in them self.

Most of the human resources used for teaching electrical/electronics trades students are not adequately available in Technical Colleges in Bauchi State, for teaching and learning to be effective there should be adequate human resource as basic part of educational

system for having a vital and decisive role in the quality of education and how well students learn. There might be seen a general public opinion that relates the level of students' learning to how much they study and do their practical work. Nevertheless, students' success in course grades and general exams, in other words their academic achievement can be affected base on the adequacy and effort of human resource (Nizamettin Koca, Bekir Celik 2015).

This was rightly observed by Elobuike, (2016) and clearly cited in the literature reviewed that learning environment which enhances acquisition of qualitative education. believes that the quality of education that our children receive is directly related to the availability or the lack of teaching physical resource and the atmosphere in which the learning takes place. Most of the physical resources used for teaching electrical/electronics trades students are adequately available in Technical Colleges in Bauchi State.

Human resources have been, described as a unique place where the learners may conduct; experiment, test, construct, dismantle, repair, design, create, imagine, and study. It is also a place where electrical and electronics equipment and materials for practical lessons are kept and utilized for training in skill acquisition, the physical resource are essential and highly needed in technical colleges for imparting the practical skills needed by students to develop in their career choice, and also for teachers to improve on skills they have acquired.

It was also discovered in the study that most needed materials for training electrical/electronics trades students are not adequately available in Technical Colleges of Bauchi State. The availability of teaching facilities enhances acquisition of qualitative education. Hornby (2016) believes that materials are the source of knowledge that guide the students and facilitate teaching and learning situation. Similarly, Afeez, (2016) noted that instructional material and education goals should be viewed as being closely interwoven and interdependent. The two have impact on the comfort, safety and performance of the students in any educational set up.

CONCLUSION

Based on the findings of this study, it was conclusion that most objectives set by the National Policy of Education and section 9 of the Degree 16 of August, 1985, are been effectively utilized in Bauchi state Technical colleges for development of students performance and future opportunity. However, most of the need resource (human, physical and material resource) for training electrical/electronics trades are not adequate available in Bauchi state technical colleges, for a Nation to achieve its goal is by improving Technical colleges through providing equip learning environment with the resource needed for the training of the youth to be self-reliant and sustainable. however, since the easiest way to achieved the gold of youth empower and sustainability is through vocational and technical education, then, provision resources for training students in

technical colleges should not be only in the hand of state government, but special intervention fund should be created for effective implementation of technical colleges programmes, this will help in equipping the workshops and laboratories effective performance and self-reliant.

Recommendations

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

i. There should be actualization of the objective, not only in electrical/electronics trades training in technical colleges but in graduate live long so that will help them in future.
ii. Efforts should made by the state government to provide reasonable number of human resource for the training of electrical/electronics trades in Bauchi state technical colleges,
iii. Bauchi state should insure regular routing through the State Ministry of Education to technical and vocational colleges as this would help ensure the achievement of stated objectives.
iv. Donor agencies should be encouraged to assist in the provision of these necessary materials for training to take place and minimizing the inadequacies of the Electrical/Electronics trades materials in Vocational and Technical Education in the state.

REFERENCE

Abdulrahaman W. L. (2013), *Technical and Vocational Education, a Tool for National Development in Nigeria,* Mediterranean Journal social sciences, vol. 4, No. 8.

Ado, Y. K. (2018). *Skill Improvement needs of electrical teachers for the maintenance of electrical Laboratory Equipment in Technical Colleges in Kano State*. A thesis submitted to the department of vocational teacher education. 4(3)

Adria, Z. (2012), *National programmes in technical and vocational education: economic and education relationships,* journal of vocational education and training, 49(3), 351-366

Alex, Christina (2019), *Partnership Between technical Institutions and theEngineering Industry in addressing Manpower needs of thelabour market in Tanzania*.International Journal of Vocational and Technical Education Research.5,

Barry, J. Z., Adam, M., John, H., Niesha, W. &Berf, F. (2011), Enhancing self reflection and mathematics achievement of at-risk Urban technical college students, *psychological test and assessment modeling*, vol. 53 (1)

Donko, C. P. (2016), *College Students attitude method of collecting teaching evaluations: in-class versus on-line.* Journal of education for business, 78(11)

Emesini, N. O. (2016). *Empowering of students in technical colleges in Nigeria with trade skills for self- reliance to enhance sustainable development*. British Journal of Education, *4(9),*

Eze, T. I. &Okorafor, O. A. (2012). Trends in technical, vocational education and training for improving the Nigerian workforce. *Ebonyi Vocational and Technology Education Journal.* 1(1), 107-115

Ezugu, L. C., Duhu, P. C. &Tanimu, A. (2020), *Improving enrolment of students in electrical installations and maintenance works trade in technical college North East Nigeria,* journal of science technology and education, 8(2)

Federal Republic of Nigeria (2013). National policy in Education (6thed.) Lagos: NERDC Press

Haruna, J. O. (2013).*Adequacy of electrical/electronic laboratory facilities in technical colleges: Implication for quality vocational trade development and access in Kaduna central senatorial district, Nigeria*. Faculty of Education, Ahmadu Bello University, Zaria Proceedings of Multicultural African Conference, Zaria Nigeria:

Ibrahim S. K. (2014)*Assessment of Electrical/electronic Laboratory Facilities in Technical Colleges in Kaduna State*. Journal of Science, Technology & Education (JOSTE);*2(2),*

Jane, I. O., Raymond, U. & Patrick, S. O. (2017), *Bridging skill gap to meet technical vocational education and training school-workplace collaboration in the 21st century,* international Journal of vocational education and training research, 3

Kehinde, T. M. And Adewuyi, L. A. (2015). *vocational and technical education: a viable tool for transformation of the nigerianeconomy*. International Journal of Vocational and Technical Education Researc,hVol.1, No.2, pp.22-31,

Masaruf M. (2015) The Role Of Vocational And Technical Education For Improving National Economy For Sustainable Development.*Journal of Research & Method in Education*p-ISSN: 2320–737X Volume 5, Issue 3 Ver. II

Miles, K. (2013). Transformation or decline Using tough times to create higher-performing schools.

National Board for Technical Education (NBTE). (2016). *Directory of accredited programmes in polytechnics,* similar tertiary institutions, technical colleges, and vocational enterprise institutions in Nigeria (16th edition).

Odu, O.K. (2013). *Philosophical and sociological overview of vocational and technicaleducation in Nigeria*. American-Eurasian Journal of Scientific Research, *6(1),*

Ogbuanya T.C., AkintondeA.A. & Bakare J. (2017) Assessment of Practical Skill Training of Technical College Students in Electrical and Electronics Trade in Osun State, Nigeria. , *International Journal of Applied Engineering Research* ISSN 0973-4562 Volume 12, Number 18 pp. 7501

Okolocha, C. C. and Baba E. I. (2016), *Role of Vocational and technical education in Nigeria Dimocratics dispensation,* international Journal of capacity building in education and management, vol. 2 No. 4

Okwelle, P. C. &Okeke, B. (2012). *Development and validation of instrument for assessing practical skills in fault diagnoses and repairs of radio and television systems in Nigerian technical colleges*. American Journal of Scientific and Industrial Research, *3(3),*

Rufai, A., Abdulkadir, M., & Abdul, B. (2013). *Technical vocational education (TVE)institutions and industries partnership: Necessity for graduates' skills acquisition*.International Journal of Scientific and Research Publications, *3*(4),

Samuel, O. B. and Yinusa, A. F. (2012), *an investigation in to the challenges facing the implementation of technical college curriculum in south west, Nigeria*, journal of education and practice, vol. 3 No. 16

Turbot, S. (2012). *Education to employment: Boost skills, bridge the gap*. Qatar Foundation'sWorld Innovation Summit for Education. http://www.sturbot.com

UNICCO (2016). *Draft strategy for technical and vocational education and training* (TVET) (2016-2021) Paris retrieved 8 January 2019.

Yekini, S.A. (2016), *Methodological needs of electrical/electronics workshop accident prevention in technical colleges in South Western part of Nigeria*.Journal of Information Engineering and Applications. (6), (5)