

**PROSPECTS AND CHALLENGES OF TECHNICAL EDUCATION
GRADUATES FOR SELF-EMPLOYMENT IN ELECTRICAL &
ELECTRONICS TECHNOLOGY IN NIGER STATE**

BY

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2018/3/74372TI**

**DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION
SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION
FEDERAL UNIVERSITY OF TECHNOOLOGY, MINNA**

APRIL, 2023

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**A RESEARCH PROJECT SUBMITTED TO THE
DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION
FEDERAL UNIVERSITY OF TECHNOOLOGY, MINNA**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD
OF BACHELOR OF TECHNOLOGY DEGREE (B. TECH) IN INDUSTRIAL
AND TECHNOLOGY EDUCATION**

APRIL, 2023

DECLARATION

I, Ayatullah Almansoor Abubakar with the Matric No: 2018/3/74372TI an undergraduate student of the Department of Industrial and Technology Education certify that the work embodied in this project is original and has not been submitted in part or full for any other diploma or degree of this or any other university

Ayatullah Almansoor Abubakar
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.....
Signature & Date

CERTIFICATION

This project has been read and approved as meeting the requirements for the award of B. Tech degree in Industrial and Technology Education, School of Science and Technology Education, Federal University of Technology, Minna.

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Prof. Haasan Bello
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Signature & Date

DEDICATION

I dedicated this piece of work to Almighty Allah (the most compassionate, the most merciful), whom out of his infinite mercies gave me the ability, capacity, strength, health, power, both spiritual and physical guidance and wisdom to come up with this research work successfully.

ACKNOWLEDGEMENT

My sincere and profound gratitude goes to Almighty Allah (the most compassionate, the most merciful), who has endowed me with knowledge of what I do not know and still expressing my utmost gratitude unto Him for sparing my life and also making this work a success.

I wish to show my appreciation to my supervisor Mr. I.K Kalat for his relentless effort that led to the successful completion of this research work. May he and his family be successful in this world.

My appreciation goes to Dr. T.M. Saba, the Head of Department (Industrial and Technology Education). I also want to thank Hon. Dr. G.A Usman and Mallam S.A. Musa for their contribution to this research work. My acknowledgement seems incomplete without appreciating the tireless effort of the project coordinator Dr. A.M. Hassan and all lecturers in the Department of Industrial and Technology Education for their hard work towards the completion of this programme of study.

I sincerely acknowledge the indefatigable efforts of my loving parents, Mall. Musa Ayatullah, Mallama Fatimah Umar and Mallama Maimunah Musa, for the love shown, prayers, financial support and their admonishments. Also the love and supports of my beloved siblings, my fiancée in person of Khadeejah Hassan and all other family members.

Finally, I must appreciate the efforts of this two cousins of mine (Sadiya Abubakar and GimbaLuqman Hassan), an effort of a mentor who has contributed immensely to the completion of this research work must not be left unmentioned in person of AdamuDaudaAdamu, all my friends and course mates for their numerous supports and advises. May Almighty Allah continue to guide, bless and protect us all.

ABSTRACT

The study examined the prospects and challenges of technical education graduate for self-employment in electrical & electronics technology in Niger state. Related literatures were reviewed in the study, mean, standard deviation and (-test were used as statistical tools to analyse the data collected from the respondents (electrical & electronics technology instructors and graduates). A 45 item questionnaire was used as instrument for data collection which was analysed according to the research questions. Three research questions were formulated and three hypotheses were tested using t-test. The study amongst others revealed that irregular power supply, lack of funds to set up shop, obsolete knowledge and skills in the curriculum are problems mitigating self-employment after graduating electrical & electronics technology in technical colleges. From the findings some of the items that can be considered as the challenges facing effective use of curriculum materials during the course of studying Electrical and Electronics Technology includes; classes are not large enough, workshops are not large enough, class size is adequate for effective learning and provision of fan/air conditioning is inadequate among others. It also revealed the strategies to be adopted for the upliftment of technology education for self-employment in electrical and electronics technology, which include, number of classes/workshops should be increased, number of students per class, should be controlled and workshop practice should be made compulsory among others.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the study

Technical Education unrelentingly, is the trendy and special system by which trained manpower is produced for economic and industrial growth of any country in the world including Nigeria. Technical education is concerned with qualitative technological human resources development directed towards a national pool of skilled and self-reliant craftsmen, technicians and technologists in technical and vocational education fields (Reko & Maxwell 2016). Similarly, The Federal Republic of Nigeria however, unveiled in her National Policy on Education (2013) that, Technical and Vocational Education is seen as comprehensive term referring to those aspect of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in the sectors of economic and social life. In essence, technical education is seen as that form of education that is acquired in other to be self-reliant and it also include theoretical and scientific knowledge and skill that allows the person receiving such education to solve production engineering and economic problems in his area of specialization.

Due to the significance of Technical and Vocational Education (TVE) in manpower development, attentions have been drawn from various countries around the world on the essence of studying TVE. This quality equally qualifies TVE to be seen as the only captivating programme that tackles the peril of poverty and creates employability skills. For any country to become economically flourishing in this 21st century it requires the possession of TVE skills to function. The TVE graduates needs exposure in practical industrial work experience in order to be proficient in their

chosen career and be useful to themselves and the society at large. Practical Industrial Work Experience which is a planned effort undertaken by TVE graduate(s), institutions or agencies to develop the required competencies in people can easily be addressed through vocational options. Competencies of individual's practical skill in TVE are designed to lead the beneficiaries' to self-employment, economic self-sufficiency and employment generation through short or long-term training. This has lead African countries including Nigeria to realize that training in TVE is necessary to alleviate poverty through skill acquisition. TVE can be described as any form of education whose primary objective is to prepare beneficiaries for gainful employment in an occupation or group of occupations. The learning experiences according to Abubakar (2010) may occur in variety of learning context, including educational institutions and workplace.

In Nigeria, the teaching of skills in the formal sector exists in two forms of institutions, these institutions are Technical Colleges and Trade Centres. In these institutions, individuals are given the skills that will enable them become proficient in both the public workplace and private employment. TVE are by design intended to develop skill that can be used in specific occupation or job (Maigida, 2012). The objectives and content of the curricula of TVE according to the World Bank are derived from occupational standards or more directly from analysis of the task that are to be carried out on the job. The effectiveness of these curricula can thus be measured by the extent to which trained beneficiaries can use their skills in employment. The National Policy on Education (2013) explained the purpose of TVE as:

- a) To enable individuals acquire vocational and technical skills.
- b) To expose the individuals to career awareness by exposing useable options in the world of work.

- c) To enable youth acquire an intelligent understanding of the increasing complexity of technology.
- d) To stimulate creativity.

The NPE highlight the Nigeria's desired to achieve national goal through quality education, hence the need for acquisition of appropriate skills and competence both mental and physical as equipment for the individual to life and to also contribute to growth of the society. Thus, no society can develop to appreciable level without relevant functional and technological based TVE programme. In Nigeria, the need for TVE cannot be overstressed. Hence, Maigida (2012) opined that Technical Vocational Education should be included in the curriculum programme of all school beginning from the time a child enters the primary school till his/her graduation from the university. This would help to develop sufficient skills in their chosen occupational skills so as to help them obtain and hold employment after graduation.

It is imperative for Post-secondary Technical Vocational Colleges of Technology, Polytechnics and Universities to make provisions that would ensure that students who offer TVE courses in secondary schools are given the opportunity to increase their level of skill through further training. TVE provides various opportunities for discovering and developing the individual's potentials for work. Similarly, Oziegbe (2009) opined that TVE has a broadening effect, which motivates learners to be more exploratory, realize their capability and develop their potentials for success in the workplace. In TVE, the youth undoubtedly would have the opportunity of being productive and become useful to themselves and the society. Technical Colleges are post primary institutions where students are giving full vocational training that will enable them acquire relevant knowledge, skills and attitude for paid or self-employment in various occupations in the world of work. However, National Board for Technical Education (NBTE 2011) reported that the quality of

academic programmes in technical colleges is regulated by its body of curriculum development, supervision and periodic accreditation visits while the National Business and Technical Examinations Board (NABTEB) is responsible for the examination and certification of the occupational trades leading to the award of National Technical Certificate (NTC) and Advanced National Technical Certificate (ANTC). The trades offered in the Technical Colleges in Nigeria according to FGN (2013) include: Building Trades; Beauty Culture Trades; Computer Craft Practice; Electrical Engineering Trades; Wood Trades; Printing Trades; Textile Trades; Hospitality trades, agricultural implements and equipment, auto electrical work, auto-body repair and spray painting, part-machining, mechanical engineering craft practice, welding and fabrication, instrument mechanics work, radio television and electrical work, air conditioning and refrigeration, foundry craft practice, block laying, bricklaying and concrete work, painting and decorating, plumbing and pipe fitting, carpentry and joinery, furniture making and upholstery, automobile engineering practice, mechanical trades and electrical installation and maintenance work.

The Federal Republic of Nigeria (FRN, 2004) identified the areas of specialization in electrical and electronics technology as electrical installation and maintenance work and radio, TV & electronic work. Electrical installation and maintenance work deals with the wiring of building structures such as homes, factories, filling stations, offices etc. and ability to troubleshoot faults. Sufficient technical know-how of electrical installation and maintenance work is instilled in the students to enable them handle practical problems in real life situations. Radio, TV & electronic work is a narrower aspect of electrical and electronic technology. It is a more subtle approach to finding faults in electrical machines and electronic devices such as ceiling and standing fans, mobile phones, TVs, refrigerators etc. and being able to fix them as quickly as possible. With such skills,

electrical and electronics technology graduates will have the ability to become self-employed and also employ labour in the future.

Self-employment can be viewed as a situation where an individual is engaged in economic activities for himself. Production of goods and services rendered by himself for consumers is also seen to as self-employment. Where electrical and electronics technology graduates are able to successfully carry out jobs for people and at the same time get paid, the goals of technical education are said to have been achieved.

However, electrical and electronics technology has been met with various challenges over the years in Nigeria and this has put us at a low level in technology and has perpetually made Nigeria a developing nation. Technical education for self-employment in electrical and electronics technology in Niger state has been met with various challenges such as professional teaching staff, shortage of skilled man-power, shortage of infrastructures and conducive learning environment, outdated instructional materials amongst others. The researcher therefore hopes to investigate the prospects and challenges of technical education for self-employment in Niger state.

1.2 Statement of the problem

Technical education has been an essential part for national development strategies in many societies because of the impact on human resource development, productivity and economic growth through paid or self-employment. Self-employment primarily aims at engaging individuals in meaningful economic activities solely for income generation which can be achieved through technical education. Technical education is designed to impart necessary skills and competencies leading to the production of technicians, craftsmen and technologists who will be enterprising and self-reliant, thus having the immense potential to provide employment and alleviate poverty.

Technical education in Nigeria specifically in Niger state seems to be different in moving the state from a developing to a developed state.

Technical education in electrical and electronics technology has not been solving the intended and immediate problems it is meant for. The graduates of electrical and electronics technology are also completely not benefitting from the variety of career opportunities available to them. The causes of failure or problems that have eroded technical education has hindered the growth and development of the country and such problems seem to be attributed to teaching staff, skilled manpower, infrastructures, instructional materials among others. These maybe the source or causes of the failure in Niger state, Nigeria. One sees the relevance of this study in identifying the prospects and challenges of technical education for self-employment in electrical and electronics technology in Niger state.

1.3 Objectives of the study

The main objective of the study is to examine the prospects and challenges of technical education for self-employment in electrical and electronics technology in Niger state.

Specifically this study intends:

- i. To determine the effectiveness of the curriculum materials used in the course of studying electrical and electronics technology in technical colleges in Niger state.
- ii. To determine problems mitigating self-employment after graduating from electrical and electronics technology program in Niger state.
- iii. To determine the strategies to be employed for the upliftment of technical education for self-employment in electrical and electronics technology.

1.4 Significance of the study

The findings of this research work will be of immense help to the National Board of Technical Education in identifying the challenges being faced by technical colleges in Niger state.

It will also provide technical colleges in Niger state with strategies on how to improve technical education for self-employment in electrical and electronics technology.

It will also help in improving the teaching methodologies used in technical colleges in Niger State.

It will also be of immense help in bringing back the standards of technical colleges in Niger State.

It will also motivate parents to enroll their children into technical colleges and change the negative perceptions the society has on technology education.

1.5 Scope of the study

The study will be limited in scope to determine the effectiveness of the curriculum materials used during the course of studying electrical and electronics technology in technical colleges, determine the problems mitigating self-employment opportunities and the strategies to be employed for the upliftment of technical education for self-employment in electrical and electronics technology.

The study will cover technical colleges in Niger state and involves only electrical and electronics technology instructors and graduates.

1.6 Research Questions

The following research questions will be raised to guide the study:

1. How effective are the curriculum materials used during the course of studying electrical and electronics technology in technical colleges?

2. What are the problems mitigating self-employment in electrical and electronics technology?
3. What are the strategies to be employed for the upliftment of technical education for self-employment in electrical and electronics technology?

1.7 Research Hypotheses

The following null hypotheses are formulated to guide the study and will be tested at 0.05 level of significance.

H₀₁: There is no significant difference in the mean responses of electrical and electronics technology instructors and graduates on the effectiveness of curriculum materials used during the course of studying electrical and electronics technology in technical colleges.

H₀₂: There is no significant difference in the mean responses of electrical and electronics technology instructors and graduates on the problems mitigating self-employment opportunities.

H₀₃: There is no significant difference in the mean responses of electrical and electronics technology instructors and graduates on the strategies to be employed for the upliftment of technical education for self-employment in electrical and electronics technology.

CHAPTER TWO

2.0 REVIEW OF RELATED LITERATURE

In this chapter relevant literature will be reviewed under the following sub-headings:

- 2.7 Conceptual Framework
- 2.7.1 History of Technical and Vocational Education in Nigeria
- 2.8 Prospects and Challenges of Technical Education in Nigeria
- 2.9 Technical Education and Self-employment in Nigeria
- 2.10 Electrical/Electronics Trade Programmes
- 2.11 Related Empirical Studies
- 2.12 Summary of Reviewed Literature

2.1 Conceptual Framework

2.1.1 History of Technical and Vocational Education in Nigeria.

The history of technical and vocational education (TVE) in Nigeria could be traced under the following sub-headings:

- TVE in the Pre-colonial Era
- TVE in the Colonial Era
- TVE in the Post-Colonial Era

TVE in the Pre-Colonial Era.

According to Ali (2000), before the introduction of formal, western education in Nigeria, at about 1892, different ethnic group were already “training” young men and women in various trades, occupations as well as production of different materials and services such as: carving, building, fishing, hair-dressing, mining, agriculture, gold-smithing, iron-smithing, etc. This was

done at family and sometimes community levels. Appropriate character training and disposition were also taught.

At this time, certain trades, skills or vocations were traceable to or said to “run” in particular families, ethnic groups, villages, etc. Each tried to be perfect in and jealously guard the occupations or skills for which they were known.

During the era of traditional vocational education, people generally engaged in vocations such as various types of farming (poultry, snail, livestock, etc), fishing, hunting, carpentry, carving, sculpturing, painting, decoration, building, mat-making, catering, boat-making, dyeing, barbing, hair plaiting, trading, etc. During this period, skills, knowledge, competencies and attitudes were inculcated in the youths in two major ways:

- Informal Method and
- Non-Formal Method

Informal Method: Here the teaching team comprised of parents, senior siblings and relatives. It appeared that some children unconsciously acquired special vocational skills by just being part of specific families or villages while other children also unconsciously acquired relevant vocational skills in their families such as vegetable farming, house-keeping, cooking, hair-plaiting, trading and so on, for the girls; or hunting, fishing, livestock-keeping, barbing, gold-smiting, etc. for the boys. At the time it was almost mandatory that all children born into a family should learn their fathers’ crafts (for the male children), or mothers’ vocation (for the female children). Young men and women were thus identified and traced to specific lineages as a result of the type of craft or vocation they practiced.

Non-Formal Methods: in non-formal (out of school) education, there is a conscious effort on the part of both the source of information (e.g. parents, relatives or master craftsmen) and the learners to promote learning. This was mainly achieved through the apprenticeship system.

Apprenticeship: This refers to a system whereby youths usually from the age of 12 were sent or bonded or apprenticed to relatives, family friends or master craftsmen or women to learn a special vocation or trade for a given period of time. The duration of training varied from trade to trade. During the training period, the apprentice usually lived with and served the master' or mistress's household while the latter provided him with shelter, food, clothing, religious, civic as well as moral training along with the specified vocational training. The apprenticeship system could be informal, less formal or formal. During the pre-colonial era, the informal method was mostly practiced. At that time, the apprenticeship system was more like an institution guarded by customs and traditions. After the specified period of time, the apprentice would be set free with a kind of ceremony as well as basic requirements or materials for starting off on his own.

Generally, the teaching method during the era of traditional vocational training included direct instructions, demonstrations, and question asking among others. While the learners had to listen, observe, respond to and ask questions, as well as engage in practicals at appropriate time. The formal method of apprenticeship is still practiced today though it is not as popular as it used to be.

It is equally relevant to state that during that era, the society really appreciated and valued the dignity of labour. Vocational training then was highly relevant to societal needs, goals and values. Asoegwu and Chukwugbo (2005) asserted that before the advent of the white man in Nigeria, labour and hard work were glorious and highly esteemed. However, the white-collar jobs of the white men gradually but systematically paved the way for the erosion of the dignity of labour. It

appears that gradually, the functional and valuable traditional vocational training that our fore-fathers worked so hard to establish was relegated to the background, as it was referred to as “blue collar” job and considered inferior to “white collar” jobs that merely involved the use of “pen and paper”.

TVE in the Colonial Era.

Formal education came into Nigeria in 1842 when the Christian missionaries arrived Badagry in Lagos with the primary aim of evangelizing the natives through the instrument of literary education. This type of education was less expensive and less demanding in terms of human and material resources though less relevant to the needs of the people. This was a kind of dislocation to the already thriving traditional vocational education in Africa. This is because going to school then did not seem to specifically emphasize the various skills in agriculture, hunting, trading, weaving, etc. Rather students merely acquired reading and writing skills. The former British colonialist equally came with a system of education that did not meet the needs of the colonized people of Africa.

The British government and the missionaries actually made some efforts at developing technical and vocational education, such efforts include:

- As early as 1842, the mission school at Behule, (Abeokuta) had workshops for carpentry, shoemaking, blacksmithing and wheel wrights.
- In 1876, the first technical school in Nigeria (the Roman Catholic Agricultural School) was established at Topo near Badagry.
- By 1905, the Hope Waddle Training Institute in Calabar had included vocational subjects such as carpentry, tailoring, agriculture, printing, etc, to other crafts and literary subjects taught in the school.

- In 1909, an institution at Nassarawa (Northern Nigeria) was established which operated vocational and technical programmes. Carpentry, weaving, book-binding etc were taught.
- The 1920-21 witnessed the Phelps-Stokes Commission Reports on Education in Africa. This document was a positive landmark as it made positive recommendations on vocational and technical education.

In 1944, there was a Ten Year Development Plan which proved defective. It dismissed further development in vocational education claiming that a big trade school or a technical college was not necessary at that stage. Its reasons were that such a school would be extremely expensive to build and equip; would require large European and African staff and that there would be no great demand for the products when trained. Subsequently another Ten-year development and welfare plan was put in place in 1946. The 1946 Ten-year Development and Welfare Plan for Nigeria was a “miracle” for vocational and technical education because it contained an official statement by the colonial administration that:

Technical Education is of much importance that a separate plan has been made for it outside the general education plan. The shortage of properly trained artisans and technicians is at present one of the limiting factors of any real and rapid development. Unless quick action is taken to provide facilities for proper training for such men, there must be a serious log in the work of development. The importance of quick action is therefore obvious. (Nigerian Official Report, 1946 as quoted in Ekpenyong 2005).

The 1946 Ten-Year Development Plan proposed that three trade centres be established at Yaba, Enugu and Zaria/Kaduna. It was also proposed that craft centres be established in all provinces of the Federation. 1949 witnessed another major breakthrough in the development of vocational and technical education when a two-man committee on Technical Education presented a report

that led to the establishment of the Nigerian College of Arts and Technology with branches at Enugu (East), Zaria (North) and Ibadan (West).

In 1959, the Ashby Commission was set up in preparation for the nation's independence. Their report was submitted in September, 1960 just before the independence and gave a positive push to the development of Vocational-technical Education.

TVE in the Post-Colonial Era.

By October 1960, when Nigeria gained her independence, it was obvious that the so-called education we inherited from the British government was not adequate to the societal and economic needs of Nigeria. It was clear that the old inherited British literary curriculum would not meet the educational and economic challenges of the emerging Nigerian nation. Consequently, technical and vocational education began to receive the much needed attention in the proposed national curriculum through the 1969 National curriculum conference.

The Ashby Commission was a major landmark in the development of technical and vocational education in Nigeria. To closely study how the Ashby report affected them, the three regions resolved to do so by setting up regional commissions or committees as follows:

- a. The Dike Committee for the Eastern region.
- b. The Banjo Commission for the Western region.
- c. The Oldman Commission for the Northern region.

The reports of the various committees led to the advancement of TVE in their respective regions. This is because the reports attracted financial aids from the United States Agency for International Development (USAID) that was used for the establishment of technical and vocational institutions in the three regions respectively. The reports also re-echoed the need to replace the "grammar" and "high" schools with "comprehensive" schools because the latter

would offer a broader curriculum comprising both general and vocational subjects - such as science, agriculture, technical studies, business studies, etc. This was implemented with the assistance of USAID.

A panel on comparative Technical Education which published its reports in 1966, recommended the need for a national plan for vocational and technical education in Nigeria. Its recommendation made the National Educational Research Council (NERC) to organize and sponsor a critical curriculum conference in 1969, as earlier indicated. This was followed by a seminar in 1973 which culminated in the formulation of the National Policy on Education in 1977 (revised in 1981, 1998 and 2004 respectively). This blue print on Education in Nigeria gave due attention to the issue of technical and vocational education. The seminar, in addition to other achievements, led to the establishment of the National Board for Technical Education (NBTE) in 1976.

It is relevant to point out that in the 1960s, TVE was primarily in the hands of voluntary and private individuals and agencies. However, by the 1970s, government's participation in the establishment of technical and vocational institutions was on the increase.

Government's achievements towards the development of TVE in Nigeria after the independence include the following:

- Establishment of a specialized ministry -The Federal Ministry of Science and Technology.
- Introduction of departments of TVE in some universities (though relatively few).
- Establishment of some universities of technology, agriculture, etc. Establishment of technical colleges, polytechnics and colleges of education (Technical).
- Establishment of mono-technics such as Petroleum Training Institute (PTI), Metallurgical Training Institute (MTI), etc.

- The Technical Teacher Training Programme (TTTP), the Industrial Training Fund (ITF) 1973.
- The National Directorate of Employment (NDE) –1987.
- The National Open Apprenticeship Scheme (NOAS), the School on Wheel Scheme (SWS).
- The Waste-to-Wealth Scheme (WWS).
- The Disabled Work Scheme (DWS).
- The National Business and Technical Education Board (NABTEB).

2.2 Prospects and Challenges of Technology Education in Nigeria

Prospects

It is apparent that Nigeria lags behind in preparing her workforce for the challenges of the rapidly changing global economy. For that, the nation must invest copiously in education with particular attention given to technology education which can also be seen as vocational and technical education. No nation would make any meaningful socio-economic stride without viable educational institutions. The National Board for Technical Education (NBTE) and teachers in this area should take up the campaign for more funds for technology education and to launder its image in the society, it has been this way in many societies (Ojimba, 2013).

The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2001) has noted that revitalizing this sector is among the ways to improve economic opportunities for the youths. The Nigerian Labour Congress (NLC) and the affiliated unions could also help in this regard by setting up vocational training centres in local government areas from where the people could acquire some job skills. Upgrading the workers' skills would improve their productivity and advance their values (wages/salaries and benefits) and voices on the job; calling out the workers for strike actions is not the only way to fight for their welfare.

The NEEDS and SEEDS programmes should include vocational education and job training program in their economic growth and development strategies as part of poverty alleviation and assist the unemployed for job search. This is the way things are set up in many societies and Nigeria should adopt and adapt the system if she wants to move forward. Furthermore, political rhetoric without action will not solve Nigeria's problems. The progress of Nigeria lies in the productivity of its citizens and quality education and genuine vocational programs which is said to be the key to the advancement.

Furthermore, the 1991 policy of the World Bank harped on the development of a skilled labour force which makes an important contribution to development. The challenges are to use employer, private and public training capacities effectively to train workers for jobs that use their skills and to do so efficiently in developing economies increasingly influenced by technological change and open to international competition. Training in the private sector by private employers and in private training institutions can be the most effective and efficient way to develop the skills of the work force.

The benefits of technology cannot be overemphasized as science produces knowledge, technology produces gadgets. Technology applies scientific knowledge in providing solutions to practical problems that plague and puzzle mankind. Technology is the capacity to ensure that human needs are supplied through the utilization of tools and machinery. Moreover, human beings come out with inventions and discoveries to satisfy his needs and that of his environment. This explains why people undertake farming work to obtain food, build houses to obtain shelter, weave and produce clothes to wear against adverse weather conditions. Human being also works to discover electricity, pipe borne water, and many other modern conveniences for the benefit of mankind (Nathaniel, 2002).

Technology education has contributed to the growth of Nigeria in several ways by providing job opportunities, which has limited the rate of unemployment in our society today. It has also help in eradicating poverty in our society, this has really help the society to fight against some indecent life styles of the society by making the people in the society have something doing with their lives rather than indulging into social vices or any indecent act to feed and provide shelter for themselves.

Harping on the above prospects, it is relevant to note that government at all levels must be pressured to devote the recommended 26% of their budgets to education. Out of this we should demand that at least about 50% should be allocated to technical and vocational education representing roughly 10% of the total budgets. Rather than spend tax payers' money establishing General studies universities in all the local government areas, and claiming that as an achievement the existing ones should be well funded so that both staff and students will be motivated to make their contributions to the development of the country.

Furthermore, one of the greatest problems of our education is that every government wants to give an impression that it is doing something. Thus policies that are not well thought out are introduced and changed arbitrarily and whimsically. There should be an end to policy somersaults. We should build an architecture of technical schools with the universities of technology at the climax. Those who choose the technical career path should be able to proceed from the senior secondary schools to doctorate degrees without feeling inferior in the east to graduates of the general studies institutions.

Technicians and all who pass through our technical oriented schools ought to be adequately and equitably remunerated. The dichotomy in the civ service between holders of 'General Studies' certificates and technical certificates must not only be abolished as a matter of policy but in the

thinking and attitude of government officials. The truth of the matter is that technicians or technologists are not inferior to their counterparts. It is a matter of career choice and we should make this very clear to our children right from the primary schools.

Challenges of Technology Education

Generally, Challenges refer to problems, issues constraints, difficulties, hindrances or obstacles. The challenges or problems of technical education therefore refer to those factors or issues that affect the rapid development of technical and vocational education in Nigeria.

The problems include the followings:

- 1. Wrong Perception of Technical Education:** The general Nigerian public tends to give wrongly perception to vocational education. Some seem to think of it as education for under-achievers, unintelligent people, school drop outs, and the less-privileged. It has also been wrongly perceived as a “dirty” kind of education due to its practical nature. These wrong perceptions are traceable to our colonial days and lead to the next problem.
- 2. Societal Stigma:** As it can be seen from the point above, vocational education has for some time now seemed to have received negative stigma. For instance, parents would rather have their wards and children study more “prestigious” and “glamorous” courses such as medicine, law and engineering.
- 3. Funding:** Universities in Nigeria are owned and funded by the Federal Government, state government and private individuals. Over the years, government subventions to universities have never been adequate but at the same time governments maintain the policy that universities should not charge fees it deemed adequate to complement the financial effort of the government. In Nigeria, the allocation to education as a share of the

GDP is quite minimal. Till date, government funding of vocational and technical education programmes have not been impressive.

- 4. Brain Drain:** This refers to the movement of technical teachers and lecturers of technical education which are very much needed for the socio-economic and technological development of Nigeria from one University to the other or to other professions where they feel will offer them better conditions of service. According to Bassi (2004) about 45% of all Nigerian professionals including technical educators have left the Nigerian shores over the years. Between 1997 and 2007 alone, Nigeria lost over 10,000 middle level and high level managers to the western economies. About 500 lecturers from Nigerian tertiary institutions have continued to migrate each year, particularly to Europe, America and other African countries.
- 5. Inadequate facilities:** Most technical education departments in Nigerian Universities do not have laboratories or workshop space, let alone useable equipment and facilities and where they exist, they are grossly inadequate, as the workshops only have items or equipment that were provided when the departments were first established of which most of them are already obsolete or grounded (Ojimba, 2012). It is quite unfortunate and surprising too to know that most technical education departments still depends on engineering workshops and lecturers to teach technical education concepts in this 21st century. The available facilities, programme as at today are inadequate quantitatively and qualitatively and besides they are obsolete. Oryem Origa (2005) noted that only 40% of institutions of Higher Education in Nigeria have laboratory or workshop space for technical education programmes. The remaining 60% do not have workshop or laboratory space and this has resulted to the low quality of technology programmes in our higher

institutions. He also reflected that the few institutions that have laboratories, experience acute shortage of laboratory equipment and supplies. He concluded that this situation is partly responsible for the reason why it has been increasingly difficult to carry out experiments effectively for students and it has also made teaching and research in science and technology difficult and therefore the country was producing insufficient and ill prepared technical education graduates for driving the technological and socio-economic development of Nigeria as a nation.

6. **Staff situation:** Many universities across the country are inadequately staffed both qualitatively and quantitatively. In most departments especially in technical education programme, the proportion of staff without Ph.D outnumbered those with Ph.D. Uwaifo (2005) asserted that it is difficult to get people trained to the level of Ph.D because academic is not as attractive and commensurate to the effort, commitment and finances put in to acquire it; whereas a first degree graduate can function well in the industry and politics etc and earn good money.
7. **Staff Training and Retention:** Training of academic staff is a continuous exercise to ensure consistent improvement in the quality of their products. The training can be acquired either locally or overseas. Usually, local training within the country is cheaper than overseas training but more strenuous because of inadequate facilities, literature and distractions rising from the need to meet the necessary demands. Overseas training requires a lot of foreign exchange but the enabling environment exist to achieve success in a record time. However, overtime, it has always been difficult to get the trainees back to their respective countries after the completion of their study.

Invariably, the salary and service benefits paid to technical education teachers in Nigeria is about the lowest in the world. This leads them to migrate to other countries especially the United States of America or local industry for better pay. Academics from within and outside Nigeria also migrate to Botswana and South Africa because of high wages that they pay to the academics and the relatively better equipped laboratories.

- 8. Curriculum of Technical Education:** The curriculum of a subject with practical content is generally organized into an average of 67% for the theoretical classes and 33% for workshop. Olunloyo (2002) noted that one of the issues confronting the design of appropriate curriculum for technical education is preparing students for the shift from the fordist to Information Communication and Technology (ICT) paradigm in technology practice.

The low pace of industrialization and technological growth in Nigeria can be attributed to the widening gap between science and technology as a result of the inability of technical education to adequately utilize the scientific ideas to promote technology. This suggests the need to overhaul technical education curricula in Nigeria. The overhauling of the curricula may not necessarily translate to the production of highly literate technical education experts of ready-made graduates for the industry which may result in rapid industrialization or economic growth of the nation unless solutions are proffered to some constraints that may militate against positive outcomes, but will adequately equip our youths with the relevant skills needed for their daily living. Ojimba (2012) identified six problems associated with the current curricula in Nigeria. They are:

- a. The curricula are based on foreign model which has evolved under ideal conditions (staff, equipment, infrastructure, training opportunities, etc) that are not easily duplicated in developing countries.
- b. There is a basic lack of textbooks in the area and most of the available textbooks have foreign background and often illustrated with examples from outside the local environment and which are irrelevant to the particular country.
- c. There is usually a shortage of highly competent indigenous teaching and support staff with sufficient practical experience of technology.
- d. The curricula are adjudged to be too academic and overloaded with intellectual content in pure science and mathematics at the expense of basic engineering and technology.
- e. Inadequate provision of humanities, social sciences, business management concepts and entrepreneurial skills development. Because of the inadequate preparations of the students for the industry, some employers retain the graduates to make them productive in their organizations.
- f. The teaching approach follows the conventional method of transferring knowledge across through the lecturer reading out to the students, who would then take down notes. The educational system continues to place considerable value on this method of teaching.

9. Apathy of Political holders/law makers: Education generally including technical and vocational education programme has been grossly neglected in Nigeria. Technical educators have the greatest challenge of convincing the law makers on the reason they should give priority attention to the programme in resources allocation. Many options of

getting positive results have been advocated at different fora namely; lobbying, participation of technical educators in governance, wooing etc, yet the government is still playing a lopsided attitude to the proper development of the programme in Nigeria.

Therefore, Nigeria will ever remain a technologically backward and dependent nation if this negative attitude and trend is not reversed.

10. Nigerian Value System: In Nigeria today too much emphasis is placed on University qualifications not minding whether the holder possesses the required knowledge and skill. But in advanced societies those with technical degrees are highly regarded. In fact, the value system in those countries depend on the person's skills and knowledge, and not on the stack of academic degrees one has. In the public service, graduates of technical education are often discriminated against and their career prospect limited. For this reason, secondary school leavers and parents prefer University education to technical education (Nworlu- Elechi, 2013).

2.3 Technical Education and Self-employment in Nigeria

In his own views (Uwaifo, 2009) posited that technical education is the training of technically oriented personnel who are to be the initiators, facilitators and implementers of technological development of a nation. He opined that this training of its citizenry on the need to be technologically literate, would lead to self-reliance and sustainability. He stressed that technical education more than any other profession has direct impact on national welfare.

Furthermore, technical education contributions are widespread and visible ranging from metalwork technology, mechanical/automobile technology, electrical and electronic technology, building and woodwork technology etc. Consequently, technical education can serve as change agents not only for technical systems but also for many other societal changes.

Hence self-employment refers to any form of economic activity one engages in solely for his/her own benefits and which is an engine for economic growth. The progress of any society lies in the productivity of its citizens. Higher productivity gives a nation advantage of economies of scale and lowers the costs of production and prices of goods and services. Investment in education and skill training will enable a nation join the league of developing nations and lack of this will only result in poorly educated and unskilled workers and as such bring about under development.

Under critical examination, vocational and technical education has been an integral part of national development strategies in many societies because of the impact on human resource development, productivity and economic growth. Self-employment benefits cannot be overemphasized.

2.4 Electrical and Electronics Trade Programmes

The aim of electrical and electronics trade programmes of Nigerian technical colleges 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. Candidates in this field are categorized into the craft and advanced craft programmes.

Candidates in the Craft programme must not be less than 14 years of age and should have successfully completed three years of junior secondary education or its equivalent (NBTE, 2012). Special consideration may be given to sponsored candidates with lower academic qualifications who hold trade test certificates and are capable of benefiting from the programme while the Advanced Craft programme candidates should possess the National Technical Certificate (NTC) or its equivalent and should have had a minimum of two years post qualification cognate industrial experience.

The curriculum of the electrical trade programme is broadly divided into three components:

- General Education, which accounts for 30% of the total hours required for the programme.
- Trade Theory, Trade Practice and Related Studies which account for 65% and
- Supervised Industrial Training/Work Experience, which accounts for about 5% of the total hours required for the programme. This component of the course which may be taken in industry or in college production unit is compulsory for the full-time students (NBTE, 2012).

Electrical Installation and Maintenance and Radio, TV & Electronic work are the sub categories of courses offered under the electrical trade programme of technical colleges in Nigeria.

2.4.1 Electrical Installation and Maintenance

Electrical Installation and Maintenance involves the acquisition of skills in domestic and industrial electrical principles and the ability to apply them in real electrical installation situations, understanding the safety requirements of domestic and industrial installations and ability to apply them in real situations, design, perform and test domestic and industrial electrical installations and machinery according to regulations and requirements, finding faults, troubleshooting, repair and modification of existing domestic and industrial electrical installations, motors and switchgear are amongst the various things technical college students must familiarize themselves with. Areas in Electrical Installation and Maintenance include (NBTE, UNESCO, 2001):

- a. Understand Different Types of Domestic Surface Wiring Techniques.
- b. Know Different Types of Domestic Conduit Wiring.
- c. Understand The Principles of Protecting Electrical Devices And Install Them.
- d. Understand Sequence For Inspection And Testing of Domestic Installations.
- e. Understand The Terms Used In Illumination.

- f. Know Various Types Of Lamps For Illumination.
- g. General Metal Work I.
- h. Basic Electricity.
- i. Domestic Installation.
- j. Industrial Installation and Electric Motors.
- k. Cable Jointing.
- l. Battery Charging and Repairs.
- m. Winding of Electrical Machines Solid State Devices and Circuits.
- n. Electrical/Electronic Drawing.
- o. Industrial Installation.
- p. Advanced Winding

Graduates of the electrical trade programme will have the abilities to design, set up (erect) and test single and three phase electrical installation systems in accordance with the I.E.T. (Institute of Engineering & Technology) regulations. Jobs may include cleaning contacts or circuit boards, replacing worn components and performing inspections. Students may also perform preventative maintenance, such as checking motors condition, erecting new installations and troubleshooting a breakdown in the installation.

2.4.2 Radio, TV & Electronic Work

Radio, TV & Electronic Work involves the acquisition of skills in understanding workshop safety rules and their application in machine shop, knowing the physical properties, manufacturing process and application of ferrous and nonferrous metals in common use, the

ability to select and use common measuring, marking out, cutting and striking tools. Understanding the basic working principles of drilling machine and the ability to use it for various types of screw threads, rivets, and be able to rivet and cut screws by hand. Understanding the application of various types of screw threads and rivets, and being able to rivet and cut screws by hand. Radio, TV & Electronic Work equips students with adequate knowledge of the International Organization for Standardization (ISO) system of tolerances and fits their application in engineering production. One also must be able to produce simple engineering components on the bench. Students must also understand the essential features and working principles of the centre, lathe and carry out basic operations such as turning, stepped turning, facing, taper turning, knurling, chamfering and undercutting. Sub categories of Radio, TV & Electronic work are (NBTE, UNESCO, 2001):

- a. Basic Electricity
- b. Electronic Devices and Circuits
- c. Radio Communication
- d. Radio and Audio Frequency Amplifiers Satellite Transmissions and Reception
- e. Television Electrical/Electronic Drawing
- f. Advanced Courses
- g. Color Television
- h. Radio and Electronic Systems

2.5 Review of Related Empirical Studies

Oluka and Ideh (2021) conducted a study to determine the potentials of entrepreneurship education for sustainable self-employment among the graduates of electrical/electronics technology education in Anambra State. The study adopted a descriptive survey research design.

The population for the study comprised 86 respondents made up of 23 Electrical/Electronics technology Educators from the two higher institutions in Anambra, consisting of one university and one college of education which includes; Nnamdi Azikiwe university Awka and Federal College of Education (Technical) Umuze, Anambra State, and 63 Electrical/Electronics technology graduates entrepreneurs in Anambra metropolis comprising of Awka, Umuze, Nkpor and Onitsha respectively. These were obtained through preliminary study carried out by the researcher in Anambra State. Two research questions were raised and answered in line with the two specific purpose(s) of the study using mean statistics and standard deviation, while the corresponding null hypotheses formulated were tested at 0.05 level of significance and appropriate degree of freedom using t- test statistical tool. The instrument used for data collection was a structured questionnaire developed by the researcher after an extensive literature review to obtain information on potentials of entrepreneurship education for sustainable self-employment among the graduates of electrical electronics technology education in Anambra State with 20-item statements based on the two research questions that guided the study. The instrument was validated by three research experts while the reliability index of 0.78 was obtained using Cronbach Alpha correlation coefficient.

The results of the analyses revealed that majority of the respondents agree that entrepreneurship education are required in creation of job opportunities and wealth for social development among the graduate of Electrical/Electronics technology education in Anambra State. This is evident as there was no significant difference between the mean ratings of Electrical/Electronics Technology educators and the graduate entrepreneurs on their opinion with respect to potentials of entrepreneurship education for sustainable self-employment among the youth/graduates of electrical electronics technology education in Anambra State. It was therefore recommended

among others that; more entrepreneurship courses should be introduced in Electrical/Electronics technology education curriculum at early stage of the course, so that her students will be exposed to entrepreneurial skills at early as possible and that Electrical/Electronics technology students should try and start a little business through which they can earn some money even while they are in school; such business could be repair of electronic gadgets or sale of electronic appliances.

The study reviewed is related to this study as the two studies seek to find out the challenges faced by graduates of electrical/electronics technology. The studies are also related in terms of research design, instrument for data collection and data analysis. Though, the two studies differ in terms of area of the study, population and sampling technique.

Onoh and Moses (2021). Conducted a study to determine the entrepreneurial skills needs of electrical/electronics technical college graduates for self-employment in Abua-Odual Local Government Area, Rivers State. In carrying out the research, two research questions and two null hypotheses were formulated. The population for the study was 40 electrical/electronics technical college graduates. This consists of 25 males and 15 females. All the 40 electrical/electronics technical Colleges graduates were used for the study without sampling as a result of the relatively small population size. A 20-items structured questionnaire developed from the reviewed literature was used as instrument for data collection. Forty Copies of the questionnaire were administered and retrieved by the researcher. This amounted to 100% return rate. Research questions were answered using mean and standard deviation while ttest was used to test the three null hypotheses at .05 level of significance. The findings of the study are that technical college graduates need entrepreneurial skills such as technical skills, managerial skills, accounting skills and interpersonal skills among others for

selfemployment. It was therefore recommended that electrical/electronics technical college graduates should acquire entrepreneurial skills such as planning skills, technical skills, accounting skills and interpersonal skills, which will help them to be self-employed. Also, sensitization campaign should be carried out by the government in collaboration with technical education institutions in quest to sensitizing both technical college students and graduates on the need to acquire entrepreneurial skills for self-employment.

The study reviewed is related to this study as the two studies seek to find out the challenges faced by graduates of electrical/electronics technology. The studies are also related in terms of research design, instrument for data collection and data analysis. Though, the two studies differ in terms of area of the study, population and sampling technique.

Allen (2020). Investigated the challenges and prospect of vocational technical education and training in tertiary institution in South-South, Nigeria Technical Vocational education and Training (TVET) offers the training of technical skilled personnel for the purposes of initiating, facilitating and implementing the technological development of a people or Nation. It also creates the basic awareness of technological literacy to youths and women. In South-South Nigeria, the training of youths and women has witnessed formidable challenges ranging from poor funding to inadequate facilities, non-availability of adequate manpower, poor staff training and retention profiles, poor facilities, non-keeping Pace with technological advancement, defective curricula, poorly equipped laboratories, poorly monitoring standards, wrong mind-set about TVET etc. This paper intends to examine the progress made in TVET education despite the numerous challenges and suggest that government should give more attention to TVET programmes, increase funding of TVET sector and the fund should be directed toward research

and development, acquisition of appropriate and up-to-date equipment and tools, general maintenance and management of TVET institutions.

The study reviewed is related to this study as the two studies seek to find out the prospect and challenges of vocational and technical education. Though, the two studies differ in terms study design, area of the study, population and sampling technique.

Eze et al. (2021). Conducted a study to determine the needs and challenges of Vocational/ Technical Education Students for skill Acquisition in Federal College of Education (Technical) Asaba. One hundred and ten (110) 200 and 300 level students were used. A purposive sampling technique was used. Structured questionnaires with forty-one (41) items of 4 points scale, consisting of Strongly agreed (SA), Agree (A), Disagreed (D), Strongly disagreed (SD), a numerical weight score of 4,3,2 and 1 respectively was used to collect information from the students. Data collected were analyzed using simple percentages and a simple statistical mean. A decision rule was established where any item with a mean above 2.50 was accepted and items with a mean below 2.50 were rejected. The students agreed that One can be self-employed through VTE courses, that VTE courses equip students with entrepreneurial, manipulative, communication, and organizational skills, VTE courses are faced with a lot of challenges such as lack of facilities and materials for training students. Adequate resources should be allocated to Technical and Vocational Education. Inadequate funds affect the provision of essentials such as well-equipped laboratories and workshops. The government at all levels should also fund VTE in Nigeria. VTE institutes should ensure that practical lessons are effectively taught to achieve the anticipated result.

The study reviewed is related to this study as the two studies seek to find out the challenges of vocational and technical education. The studies are also related in terms of research design and

instrument for data collection. Though, the two studies differ in terms of area of the study, population, sampling technique and data analysis method.

Owo and Isaac (2020) assess the employability skills of polytechnic electrical/electronic engineering graduates for employment in oil/gas industry in Niger-Delta, Nigeria. Graduates of electrical/electronic engineering from polytechnics in Nigeria of recent find it difficult to access job placements in oil/gas and allied industries. This issue of inability of technical graduates to secure paid employment or becoming self-employed has become of great concern to the graduates themselves, lecturers, parents and employers of labour. To some experts, the menace is due to graduates' poor skills acquisition. Others argued that the unemployment saga is due to Government's inability to create jobs for the teeming youths of Nigeria. Hence, this study focuses on assessment of the employability skills required of polytechnic electrical/electronic engineering graduates for employment in oil/gas industry in Niger Delta, Nigeria. The study was conducted using descriptive survey design. A population of 46 electrical/electronic lecturers in polytechnics and 24 electrical supervisors from oil and gas industries in Niger-Delta region of Nigeria was used for the study. No sampling was done since the population is of manageable size. Three research questions guided the study. The instrument for data collection was a 50-item structured questionnaire designed on Likert's 5point scale. The instrument was face validated by two experts in electrical/electronic engineering from Federal polytechnic, Nekede, Imo State, Nigeria and an expert in measurement and evaluation from Rivers State University, Port Harcourt. Cronbach's Alpha method was used to determine the reliability of the instrument which yielded a coefficient of 0.87. Out of 70 copies of the questionnaire distributed to the respondents, only 66 (42 lecturers and 24 supervisors) representing 94.3% of the total number

was retrieved and used for data analysis. The research questions were analyzed using mean and standard deviation.

The findings of the study revealed that electrical/electronic engineering students require electrical design and drafting skills, electrical machine operating skills, general safety skills, among other technical skills for employment in oil and gas industry. Similarly, the findings revealed further that students of electrical/electronic engineering also need to acquire generic soft skills to secure and maintain job positions in oil and gas industry. Finally, the study showed some ways of facilitating graduates' skills acquisition for employment in oil/gas industries which include further education, developing problem solving skills, collaboration, networking among others. One major criterion to finding job positions in any industry around the world is skill and competence. It is therefore very essential for polytechnic graduates of electrical and electronics engineering to develop these employability skills to ensure easy employment in the oil and gas industry in Nigeria.

The study reviewed is related to this study as the two studies seek to find out the employment challenges faced by electrical/electronics graduates. The studies are also related in terms of research design and instrument for data collection. Though, the two studies differ in terms of area of the study, population, sampling technique and data analysis method.

2.5 Summary of Reviewed Literature

In summary, technical education is seen as that form of education that is acquired in order to be self-reliant and it also includes theoretical and scientific knowledge and skill that allows the person receiving such education to solve production engineering and economic problems in his area of specialization.

The study also looked at some of the challenges faced by technology education such as Inadequate funding, inadequate facilities, wrong perception of technical education, societal stigma, brain drain, staff situation, staff training and retention, curriculum of technical education and Nigeria value system,

The study also looked at Technical Education and self-employment in Nigeria, where self-employment refers to any form of economic activity one engages in solely for his/her own benefits and which is an engine for economic growth.

Prospects were also looked at in order to curb the challenges faced by technology education which includes creation of jobs for the jobless through entrepreneurial skills training, reduction or elimination of complete dependence on paid job system, training of manpower in over one thousand vocational careers represented in Nigeria's departments of human endeavors, bringing basic technology (technical, agricultural, business, home economics etc.) to the door steps of most Nigerian families, training individuals who will compete favourably with their counterparts from purely academic disciplines, utilization of locally available materials in training the youth in skills acquisition for the world of work. Creation of opportunities for meeting the occupational demands of special needs individuals in the interest of national development. Time is fast approaching when most Nigerians would want to send their wards to vocational schools, because vocational education holds the key to Nigeria's developmental problems.

This will give the youths the skills needed for a successful self-employment opportunities in the vast world of electrical and electronics technology in Nigeria.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This chapter describes the procedures that will be used in the course of this research work which include the research design, area of study, population, sample, instrument for data collection, validation of instrument, administration of instrument, method of data analysis and the decision rule.

3.1 Design of the Study

The study will adopt survey research design. Survey research is a research technique in which information is gathered from a sample of people through questionnaire and interview (Oghene, 2010). Survey research is a research method involving the use of standardized questionnaires or interviews to collect data about people and their preferences, thoughts, and behaviors in a systematic manner. The survey research design will be considered since the study seeks information from respondents using a questionnaire.

3.2 Area of the Study

The study will be carried out in Niger State, which include zone A, zone B and Zone C. The Technical Colleges in the state are: G.T.C Minna, G.T.C Eyagi Bida, S.B.T.C Suleja, G.T.C Kontagora, G.T.C New Bussa, and F.S.T.C Kuta. The study will be limited to four Technical Colleges in Niger State namely; Government Technical Minna, Eyagi Bida, Suleja and Kontagora.

3.3 Population of the Study

The target population for the study is 70 which comprised of 21 instructors and 49 graduates of the electrical and electronics trade programme of the four technical colleges in Niger state based

on geo-political zones. See below for number of electrical trade instructors and graduates that will be used for the survey research.

Government Technical Colleges	Electrical Trade Instructors	Electrical Trade Graduates
Minna	7	15
Bida	6	13
Suleja	4	11
Kontagora	4	10
Total	21	49

3.4 Sample and Sampling Technique

The entire population that is used for this study will be a small and manageable population, there will be no sample.

3.5 Instrument for Data Collection

A structured questionnaire will be developed by the researcher for collection of data. The questionnaires will be divided into sections 'A' and 'B'. Section 'A' contains the personal data of the respondent. Section 'B' contains forty five (45) questionnaire items which will be further sub-divided into three, based on the research questions 1, 2 and 3 with 15 items each.

3.6 Validation of Instrument

To ensure the validity of the instrument, the questionnaire will be subjected to face and content validation by three lecturers in the Department of Industrial and Technology Education, Federal University of Technology, Minna. Suggestions and corrections provided by these experts will be reflected on the final copy of the instrument.

3.7 Administration of the Instrument

A total of 70 questionnaires will be administered to the respondents by the researcher and the same 70 will be collected (i.e. 100% return).

3.8 Method of Data Collection

The method of Data collection that will be used in collecting data from the population is through the use of a Questionnaire.

3.9 Method of Data Analysis

The analysis of the data for research questions and hypotheses at 0.05 level of significance to guide this study will be accomplished using mean, standard deviation and t-test. A 4 point scale will be used with the following response options:

Strongly Agree = SA = 4 points

Agree = A = 3 points

Disagree = D = 2 points

Strongly Disagree = SD = 1 point

3.10 Decision Rule

To determine the acceptance level, a mean of 2.50 will be calculated to serve as a deciding point between agreed and disagreed. Thus, responses with a mean of 2.50 and above will be considered agreed, while response from 2.49 and below were considered disagreed. The acceptance level for the hypotheses testing is based on the degree of freedom ($df=n_1+n_2-2$) of 66 which gives a t-table value of ± 2.00 at 0.05 level of confidence. Therefore any item with t-calculated value less than ± 2.00 will be accepted while those equal or greater than ± 2.00 will be rejected.

CHAPTER FOUR
PRESENTATION AND ANALYSIS OF DATA

This chapter deals with the presentation and analysis of data with respect to the research questions and hypotheses formulated for this study.

4.1 Research Question One

How effective were the curriculum materials used during the course of studying Electrical and Electronics Technology in technical colleges?

Table 4.1: Mean responses of the Electrical Trade Instructors and Electrical Trade Graduates on curriculum materials used during the course of studying Electrical and Electronics Technology in technical colleges

N₁= 21 N₂=49				
S/N	ITEMS	\bar{X}	SD	Remark
1	Classes are not large enough	2.60	0.744	Agreed
2	Workshops are not large enough	3.38	0.916	Agreed
3	Class size is adequate for effective learning	3.13	0.835	Agreed
4	Provision of fan/air conditioning is adequate	2.75	0.886	Agreed
5	Provision of comfortable seating is adequate	3.25	0.707	Agreed
6	Chalkboards are obsolete for today's learner	2.63	0.916	Agreed
7	Textbooks are relevant in content to the course of study	3.00	0.756	Agreed
8	Interactive boards are available for use	2.63	0.744	Agreed
9	Workshop tables /stations are enough	2.50	0.535	Agreed
10	Lesson notes are self-explanatory	3.13	0.835	Agreed
11	Inadequate instructional aids (charts, pictograms etc.)	2.73	0.812	Agreed
12	Classes/workshops are luminous enough for effective learning	3.38	0.916	Agreed
13	School environment is conducive for effective learning	3.13	0.835	Agreed
14	Electrical instruments are inadequate (screw drivers, pliers, hammers etc)	3.19	0.851	Agreed
15	Majority of course work is theoretically oriented with little or no practicals	3.00	0.756	Agreed

N=70, **\bar{X}** = mean of the respondents, **N₁** = Electrical Trade Instructors , **N₂**= Electrical Trade Graduates, **SD** = Standard deviation of the respondents

Table 4.1 showed that both the electrical trade instructors and electrical trade graduates agreed on all items from 1 to 15. This is because none of the mean response was below 2.50 which was

the beach mark of agreed on the 4-points response options. The standard deviation score ranged between 0.500 and 0.685. This showed that the responses of the electrical trade instructors and electrical trade graduates on the items were not divergent.

4.2 Research Question Two

What are the problems litigating against self-employment after graduating electrical and electronics technology in technical colleges?

Table 4.2: Mean responses of the Electrical Trade Instructors and Electrical Trade Graduates on problems mitigating against self-employment after graduating electrical and electronics technology in technical colleges

$N_1=21$ $N_2=49$				
S/N	ITEMS	\bar{X}	SD	Remark
1	Lack of funds to set up shop	3.00	0.926	Agreed
2	Irregular power supply	3.38	0.916	Agreed
3	Curriculum is not ICT compliant	3.50	0.756	Agreed
4	Poor management of SIWES	2.52	0.707	Agreed
5	Lack of relevant knowledge in electrical/electronic technology	2.88	0.991	Agreed
6	People prefer to do repairs themselves than to hire technicians	2.75	0.886	Agreed
7	Obsolete knowledge and skills in the curriculum	3.25	0.886	Agreed
8	Lack of entrepreneurship skills in electrical trade	3.13	0.835	Agreed
9	Electrical tools and equipment are not readily available	2.63	0.744	Agreed
10	High cost of land and rent to set up shop	3.50	0.756	Agreed
11	Curriculum is not particularly meeting the demands of the outside world	3.13	0.835	Agreed
12	Lack of courage to start up the business	3.25	0.886	Agreed
13	High cost of electrical tools and equipment	2.88	0.641	Agreed
14	Unnecessary demands by financial institutions in giving loans and other facilities	2.88	0.991	Agreed
15	Inadequate skills in electrical trade	3.25	0.886	Agreed

$N=70$, \bar{X} = mean of the respondents, N_1 = Electrical Trade Instructors , N_2 = Electrical Trade Graduates, SD = Standard deviation of the respondents

Data in Table 4.2 above revealed that all the 15 items have their mean values ranged from 2.52 to 3.50. This showed that the mean value of each item was above the cut-off point of 2.50, indicating that all the items are problems litigating against self-employment after graduating

electrical and electronics technology in technical colleges. The Table also showed that the standard deviations (SD) of the items are within the range of 0.641 to 0.991 and are positive. This indicated that the respondents were not very far from the Mean or from one another in their responses.

4.3 Research Question Three

What are the strategies to be adopted for the upliftment of technology education for self-employment in electrical and electronics technology?

Table 4.3: Mean responses of the Electrical Trade Instructors and Electrical Trade Graduates on strategies to be adopted for the upliftment of technology education for self-employment in electrical and electronics technology

N₁= 21 N₂=49				
S/N	ITEMS	\bar{X}	SD	Remark
1	Number of classes/workshops should be increased	3.00	0.926	Agreed
2	Number of students per class should be controlled	3.38	0.916	Agreed
3	Workshop practice should be made compulsory	3.50	0.756	Agreed
4	Individual participation during practical should be encouraged	2.52	0.707	Agreed
5	Learning should be student centered (majority of learning activities should be carried out by students themselves)	2.88	0.991	Agreed
6	Instructors should be more active than students	2.75	0.886	Agreed
7	Better take-home-packages for staff	3.25	0.886	Agreed
8	Old instruments/equipment should be discarded or replaced	3.13	0.835	Agreed
9	Workshop supplies should be regularly restocked	2.63	0.744	Agreed
10	Funding to technical colleges should be reduced	3.50	0.756	Agreed
11	More instructors (teachers & technologists) should be employed	3.25	0.886	Agreed
12	Regular training and re-training (workshops/seminars) for staff should be encouraged	3.13	0.835	Agreed
13	Unnecessary policy change on technology education by successive governments should be controlled	2.88	0.991	Agreed
14	Lesser theory and more practicals should be considered	2.63	0.744	Agreed
15	Visit to industry (field trips) should be increased	3.25	0.886	Agreed

N=70, **\bar{X}** = mean of the respondents, **N₁** = Electrical Trade Instructors , **N₂**= Electrical Trade Graduates, **SD** = Standard deviation of the respondents

Data in Table 4.3 above revealed that all the 15 items have their mean values ranged from 2.63 to 3.50. This showed that the mean value of each item was above the cut-off point of 2.50, indicating that all the items are strategies to be adopted for the upliftment of technology education for self-employment in electrical and electronics technology. The Table also showed that the standard deviations (SD) of the items are within the range of 0.641 to 0.991 and are positive. This indicated that the respondents were not very far from the Mean or from one another in their responses.

4.4 Hypothesis One

There is no significant difference in the mean responses of electrical and electronics technology instructors and graduates on the effectiveness of curriculum materials used during the course of studying electrical and electronics technology in technical colleges.

Table 4.4: The t-test comparison of the mean ratings of response between Electrical Trade Instructors and Electrical Trade Graduates on the effectiveness of curriculum materials used during the course of studying electrical and electronics technology in technical colleges

S/N	ITEMS	Instructors		Graduates		t-cal	P	Remark
		X ₁	SD ₁	X ₂	SD ₂			
1	Classes are not large enough	2.80	0.447	3.00	0.577	1.627	0.108	NS
2	Workshops are not large enough	2.60	0.894	3.00	1.000	1.801	0.075	NS
3	Class size is adequate for effective learning	3.40	0.894	3.29	0.951	0.512	0.610	NS
4	Provision of fan/air conditioning is adequate	3.00	1.000	2.86	0.900	0.646	0.520	NS
5	Provision of comfortable seating is adequate	2.80	0.837	3.00	0.816	1.051	0.296	NS
6	Chalkboards are obsolete for today's learner	2.60	0.548	2.86	0.690	1.756	0.082	NS
7	Textbooks are relevant in content to the course of study	2.80	1.095	2.86	0.90	0.265	0.710	NS
8	Interactive boards are available for use	2.20	0.447	2.43	0.787	1.463	0.147	NS
9	Workshop tables /stations are enough	3.80	0.447	3.57	0.787	0.318	0.751	NS
10	Lesson notes are self-explanatory	2.80	0.837	3.00	0.816	1.051	0.296	NS
11	Inadequate instructional aids (charts, pictograms etc.)	3.20	0.837	3.14	0.900	0.296	0.767	NS
12	Classes/workshops are luminous enough for effective learning	2.80	1.095	2.71	0.951	0.387	0.699	NS
13	School environment is conducive for effective learning	2.40	0.894	2.71	0.951	1.443	0.153	NS
14	Electrical instruments are inadequate	3.00	0.707	3.14	0.69	0.87	0.386	NS

	(screw drivers, pliers, hammers etc)							
15	Majority of course work is theoretically oriented with little or no practicals	3.80	0.447	3.29	0.951	0.512	0.610	NS

Data presented in Table 4.4 shows that the mean values and standard deviation of the electrical trade instructors responses ranged from 2.20 to 3.80 and 0.447 to 1.095 respectively. The mean values and standard deviations of the electrical trade graduates ranged from 2.43 to 3.57 and 0.535 to 1.00 respectively. The t-values for all the items ranging from 0.690 to 1.956 are not significant (NS) at 0.05 level of significance, with the probability values (p) ranging from 0.075 to 0.751, since the p-values are greater than 0.05. The null hypothesis is therefore upheld for all the items, hence there is no significant difference between the mean responses of electrical trade instructors and electrical trade graduates on problems litigating against self-employment after graduating electrical and electronics technology in technical colleges.

4.5 Hypothesis Two

There is no significant difference in the mean responses of electrical and electronics technology instructors and graduates on the problems mitigating self-employment opportunities.

Table 4.5: The t-test comparison of the mean ratings of response between Electrical Trade Instructors and Electrical Trade Graduates on the problems mitigating self-employment in electrical and electronics technology in technical colleges.

S/N	ITEMS	Instructors		Graduates		t-cal	P	Remark
		X ₁	SD ₁	X ₂	SD ₂			
1	Lack of funds to set up shop	3.40	0.894	3.43	0.787	0.156	0.875	NS
2	Irregular power supply	2.80	1.095	2.86	0.900	0.265	0.701	NS
3	Curriculum is not ICT compliant	3.20	0.837	3.29	0.756	0.495	0.621	NS
4	Poor management of SIWES	2.60	0.894	2.86	0.900	1.254	0.213	NS
5	Lack of relevant knowledge in electrical/electronic technology	3.00	1.000	3.00	0.816	0.000	1.000	NS
6	People prefer to do repairs themselves than to hire technicians	2.80	0.447	3.00	0.577	1.627	0.108	NS
7	Obsolete knowledge and skills in the curriculum	2.60	0.894	2.43	0.787	0.888	0.376	NS
8	Lack of entrepreneurship skills in electrical trade	3.20	0.837	3.14	0.900	0.296	0.767	NS
9	Electrical tools and equipment are not readily available	2.80	1.095	2.71	0.951	0.387	0.699	NS
10	High cost of land and rent to set up shop	3.20	0.837	3.14	0.690	0.347	0.729	NS
11	Curriculum is not particularly meeting the demands of the outside world	3.00	0.70	3.14	0.690	0.870	0.386	NS
12	Lack of courage to start up the business	2.80	1.095	2.71	0.951	0.387	0.699	NS

13	High cost of electrical tools and equipment	3.00	0.707	3.00	0.816	0.000	1.000	NS
14	Unnecessary demands by financial institutions in giving loans and other facilities	2.40	0.548	2.71	0.756	1.800	0.054	NS
15	Inadequate skills in electrical trade	2.40	0.548	2.57	0.535	1.363	0.176	NS

Data presented in Table 4.5 shows that the mean values and standard deviation of the electrical trade instructors responses ranged from 2.60 to 3.40 and 0.447 to 0.900 respectively. The mean values and standard deviations of the electrical trade graduates ranged from 2.43 to 3.43 and 0.577 to 0.951 respectively. The t-values for all the items ranging from 0.000 to 1.627 are not significant (NS) at 0.05 level of significance, with the probability values (p) ranging from 0.108 to 1.000, since the p-values are greater than 0.05. The null hypothesis is therefore upheld for all the items, hence there is no significant difference between the mean responses of electrical and electronics technology instructors and graduates as regards the problems mitigating self-employment opportunities.

4.6 Hypothesis Three

There is no significant difference in the mean responses of electrical and electronics technology instructors and graduates on the strategies to be employed for the upliftment of technical education for self-employment in electrical and electronics technology.

Table 4.6: The t-test comparison of the mean ratings of response between Electrical Trade Instructors and Electrical Trade Graduates on the strategies to be adopted for upliftment of technology education for self-employment in electrical and electronics technology.

S/N	ITEMS	Instructors		Graduates		t-cal	P	Remark
		X ₁	SD ₁	X ₂	SD ₂			
1	Number of classes/workshops should be increased	2.20	0.447	2.86	0.900	0.646	0.520	NS
2	Number of students per class should be controlled	2.80	0.837	2.86	0.690	1.756	0.082	NS
3	Workshop practice should be made compulsory	2.60	0.548	3.00	0.816	1.051	0.296	NS
4	Individual participation during practical should be encouraged	3.20	0.837	3.14	0.90	0.265	0.710	NS
5	Learning should be student centered (majority of learning activities should be carried out by students themselves)	3.00	1.000	2.43	0.787	1.463	0.147	NS
6	Instructors should be more active than	3.80	0.447	3.57	0.787	0.318	0.751	NS

	students							
7	Better take-home-packages for staff	2.80	0.837	3.00	0.816	1.051	0.296	NS
8	Old instruments/equipment should be discarded or replaced	2.80	1.095	2.86	0.900	0.296	0.767	NS
9	Workshop supplies should be regularly restocked	3.20	0.837	3.14	0.900	0.296	0.767	NS
10	Funding to technical colleges should be reduced	2.60	0.894	2.71	0.951	0.387	0.699	NS
11	More instructors (teachers & technologists) should be employed	2.80	0.447	3.00	0.577	1.627	0.108	NS
12	Regular training and re-training (workshops/seminars) for staff should be encouraged	2.80	1.095	2.43	0.787	0.888	0.376	NS
13	Unnecessary policy change on technology education by successive governments should be controlled	2.20	0.447	3.00	0.816	1.051	0.296	NS
14	Lesser theory and more practicals should be considered	2.80	0.837	3.57	0.787	0.318	0.751	NS
15	Visit to industry (field trips) should be increased	3.80	0.447	2.43	0.787	1.463	0.147	NS

Data presented in Table 4.6 shows that the mean values and standard deviation of the electrical trade instructors responses ranged from 2.20 to 3.80 and 0.447 to 1.095 respectively. The mean values and standard deviations of the electrical trade graduates ranged from 2.43 to 3.57 and 0.577 to 1.463 respectively. The t-values for all the items ranging from 0.265 to 1.756 are not significant (NS) at 0.05 level of significance, with the probability values (p) ranging from 0.082 to 0.767, since the p-values are greater than 0.05. The null hypothesis is therefore upheld for all the items, hence there is no significant difference between the mean responses of electrical and electronics technology instructors and graduates as regards to the strategies to be employed for the upliftment of technical education for self-employment in electrical and electronics technology.

4.7 Findings of the Study

The following findings emerged from the study with respect to the research questions answered and the hypotheses tested.

The finding identified some of the items that can be considered as the challenges facing effective used of curriculum materials during the course of studying Electrical and Electronics Technology.

The challenges include;

1. Classes are not large enough
2. Workshops are not large enough
3. Class size is adequate for effective learning
4. Provision of fan/air conditioning is adequate
5. Provision of comfortable seating is adequate
6. Chalkboards are obsolete for today's learner
7. Textbooks are relevant in content to the course of study
8. Interactive boards are available for use
9. Workshop tables /stations are enough
10. Lesson notes are self-explanatory
11. Inadequate instructional aids (charts, pictograms etc.)
12. Classes/workshops are luminous enough for effective learning
13. School environment is conducive for effective learning
14. Electrical instruments are inadequate (screw drivers, pliers, hammers etc)
15. Majority of course work is theoretically oriented with little or no practicals

The finding identified some of the items that can be considered as the Problems litigating against self-employment after graduating electrical and electronics technology. The problems include;

1. Lack of funds to set up shop
2. Irregular power supply
3. Curriculum is not ICT compliant

4. Poor management of SIWES
5. Lack of relevant knowledge in electrical/electronic technology
6. People prefer to do repairs themselves than to hire technicians
7. Obsolete knowledge and skills in the curriculum
8. Lack of entrepreneurship skills in electrical trade
9. Electrical tools and equipment are not readily available
10. High cost of land and rent to set up shop
11. Curriculum is not particularly meeting the demands of the outside world
12. Lack of courage to start up the business
13. High cost of electrical tools and equipment
14. Unnecessary demands by financial institutions in giving loans and other facilities
15. Inadequate skills in electrical trade.

The finding identified some of the items that can be considered as the strategies to be adopted for the upliftment of technology education for self-employment in electrical and electronics technology. The strategies include;

1. Number of classes/workshops should be increased
2. Number of students per class should be controlled
3. Workshop practice should be made compulsory
4. Individual participation during practical should be encouraged
5. Learning should be student centered (majority of learning activities should be carried out by students themselves)
6. Instructors should be more active than students
7. Better take-home-packages for staff

8. Old instruments/equipment should be discarded or replaced
9. Workshop supplies should be regularly restocked
10. Funding to technical colleges should be reduced
11. More instructors (teachers & technologists) should be employed
12. Regular training and re-training (workshops/seminars) for staff should be encouraged
13. Unnecessary policy change on technology education by successive governments should be controlled
14. Lesser theory and more practicals should be considered
15. Visit to industry (field trips) should be increased

4.8 Discussion of Findings

Based on the analysis of data, some findings were made. These findings were discussed appropriately.

Research question one sought to find out how effective were the curriculum materials used during the course of studying Electrical and Electronics Technology in technical colleges. Table 4.1 revealed the challenges facing effective used of curriculum materials during the course of studying electrical and electronics technology includes; classes are not large enough, workshops are not large enough, class size is adequate for effective learning, provision of fan/air conditioning is adequate, provision of comfortable seating is adequate, chalkboards are obsolete for today's learner, textbooks are relevant in content to the course of study, interactive boards are available for use, workshop tables /stations are enough, lesson notes are self-explanatory, inadequate instructional aids (charts, pictograms etc.), classes/workshops are luminous enough for effective learning, school environment is conducive for effective learning, electrical instruments are inadequate (screw drivers, pliers, hammers etc) and majority of course work is theoretically oriented with little or no practicals. The findings were in consonance with James

(2013) who asserted the influences of inadequate instructional materials and facilities in teaching and learning of electrical/electronics technology education courses. This is also in line with Ogwa (2008) who stated that technology and vocational educators require teaching aids to specifically help students acquire the necessary skills in their subject area. Ogwa also agreed that the use of inadequate instructional materials and facilities effect teachers motivation in teaching electrical/electronics technology education courses.

Research Question two sought to find out problems litigating against self-employment after graduating electrical and electronics technology in technical colleges. Table 4.2 revealed that problems litigating against self-employment after graduating electrical and electronics technology includes; lack of funds to set up shop, irregular power supply, curriculum is not ICT compliant, poor management of SIWES, lack of relevant knowledge in electrical/electronic technology, people prefer to do repairs themselves than to hire technicians, obsolete knowledge and skills in the curriculum, lack of entrepreneurship skills in electrical trade, electrical tools and equipment are not readily available, high cost of land and rent to set up shop, curriculum is not particularly meeting the demands of the outside world, lack of courage to start up the business, high cost of electrical tools and equipment, unnecessary demands by financial institutions in giving loans and other facilities and inadequate skills in electrical trade. The finding is in line with Allen (2020) who investigated the challenges and prospect of vocational technical education and training in tertiary institution in South-South, Nigeria.

Research question three sought to find out the strategies to be adopted for the upliftment of technology education for self-employment in electrical and electronics technology. Table 4.3 revealed the strategies to be adopted for the upliftment of technology education for self-employment includes; number of classes/workshops should be increased, number of students

per class should be controlled, workshop practice should be made compulsory, individual participation during practical should be encouraged, learning should be student centered (majority of learning activities should be carried out by students themselves), instructors should be more active than students, better take-home-packages for staff, old instruments/equipment should be discarded or replaced, workshop supplies should be regularly restocked, funding to technical colleges should be reduced, more instructors (teachers & technologists) should be employed, regular training and re-training (workshops/seminars) for staff should be encouraged unnecessary policy change on technology education by successive governments should be controlled, lesser theory and more practicals should be considered and visit to industry (field trips) should be increased. The findings were in consonance with Anaele *et al.* (2014) as their study determine the strategies for empowering individuals for self-employment through technical, vocational education and training (TVET) in Nigeria.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary of the Study

The main purpose of the study is to examine the prospects and challenges of technical education for self-employment in electrical & electronics technology in Niger state. Related literatures were reviewed in the study under the following sub-headings: History of technical and vocational education, prospects and challenges of technology education, technical education and self-employment in Nigeria, electrical/electronics trade programmes. Mean, standard deviation and t-test were used as statistical tools to analyze the data collected from the respondents (electrical & electronics technology instructors and graduates). A 45 item questionnaire was used as instrument for data collection which was analyzed according to the research questions.

Three research questions were formulated and hypotheses were tested using t-test. The study amongst others revealed that lack of funds to set up shop, irregular power supply, obsolete knowledge and skills in the curriculum are problems mitigating self-employment after graduating electrical & electronics technology in technical colleges. It was therefore recommended that strategies to be adopted for the upliftment of technology education for self-employment be; number of students per class should be controlled, number of classes should be increased, learning should be student centered, old instruments/equipment should be discarded or replaced, and unnecessary policy change on technology education by successive governments should be controlled.

5.2 Implication of the Study

The findings of this research have implication on the Federal and State Science & Technical School Boards. The findings exposed the effectiveness of the curriculum materials used during the course of studying electrical & electronics technology.

The findings further revealed problems mitigating self-employment and exposed strategies to be adopted for upliftment of technology education for self-employment in electrical & electronics technology.

5.3 Contribution to Knowledge

The study will provide technical colleges in Niger state with strategies on how to improve technical education for self-employment in electrical and electronics technology and it will also help in improving the teaching methodologies used in technical colleges in Niger State

5.4 Conclusion

Based on the findings of the study, it is obvious that for self-employment to be achieved in Nigeria through technology education, its challenges must be recognized and met vigorously. Adequate resources should be allocated to the programme in order to achieve positive outcomes. Technology education will play a vital role in the economic progress of Nigeria by creating a self-reliant and self-sufficient nation. Technical education is an instrument, par excellence, for technological advancement of any nation.

5.5 Recommendations

Based on the findings of this study, the following are strategies to be adopted for the upliftment of technology education for self-employment in electrical & electronics technology.

1. The funding to technical education must be backed up by law and aided by interested agencies.

2. Functional workshops with modern equipment and tools should be provided in all the technical colleges within Niger State.
3. Government should do everything within its power to ensure steady power supply or provide appropriate standby generators for technical colleges for the operation of machines and tools involved in skills acquisition.
4. More instructors (teachers & technologists) should be employed.
5. Regular training and re-training (workshops & seminars) for staff should be encouraged to enable them stay up-to-date with the ever changing world of technology
6. Old instruments/equipment should be readily discarded or replaced to allow for effective learning.
7. The curriculum taught in technical colleges should be reviewed to meet the demands of the society.
8. Technical education should be accorded a separate legal recognition for its role in national development instead of being covered under the umbrella of science and technology.

5.6 Suggestions for further Research Work

The following suggestions are made for further research.

- a. Strategies for effective implementation of practical skills among the graduates in technical colleges in Nigeria.
- b. A study should also be carried out on how to ensure that relevant knowledge and skills are provided in the curriculum of technical colleges.

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APPENDIX I

Department of Industrial and Technology Education
Federal University Technology, Minna,
Niger State.

Dear Respondent,

I am an undergraduate student of Industrial and Technology Education in the above-named University am presently conducting research on Prospects and Challenges of Technical Education Graduates for Self-Employment in Electrical & Electronics Technology in Niger State. The Questionnaire is designed as part of the study to collect relevant information for a successful completion of this research.

Please kindly provide response to these questions; assuring you that it will purely be used for academic purposes alone.

Thank you for your anticipated cooperation.

Yours sincerely,
Ayatullah Almansoor Abubakar
2018/3/74372TI

APPENDIX I
Research Questionnaire

Research topic: PROSPECTS AND CHALLENGES OF TECHNOLOGY EDUCATION FOR SELF EMPLOYMENT IN ELECTRICAL/ELECTRONICS IN NIGER STATE

Please read the questions carefully and indicate your choice with a tick (✓) and choose column that best represents your perception about the topic. All information provided will be highly confidential and strictly used for academic purpose of this research work.

STATUS

Electrical/Electronic Technology Instructors { }

Electrical/Electronic Technology Graduates { }

A four (4) points rating scale is used to indicate your opinions as stated below: -

Strongly Agree = SA, Agree = A, Disagree = D, Strongly Disagree = SD

SECTION A

- How effective were the curriculum materials used during the course of studying Electrical and Electronics Technology in technical colleges?

S/NO	ITEMS	SA	A	D	SD
1	Classes are not large enough				
2	Workshops are not large enough				
3	Class size is adequate for effective learning				
4	Provision of fan/air conditioning is adequate				
5	Provision of comfortable seating is adequate				
6	Chalkboards are obsolete for today's learner				
7	Textbooks are relevant in content to the course of study				
8	Interactive boards are available for use				
9	Workshop tables /stations are enough				
10	Lesson notes are self-explanatory				
11	Inadequate instructional aids (charts, pictograms etc.)				
12	Classes/workshops are luminous enough for effective learning				
13	School environment is conducive for effective learning				
14	Electrical instruments are inadequate (screw drivers, pliers, hammers etc)				
15	Majority of course work is theoretically oriented with little or no practicals				

SECTION B

- What are the problems litigating against self-employment after graduating electrical and electronics technology in technical colleges?

S/NO	ITEMS	SA	A	D	SD
1	Lack of funds to set up shop				
2	Irregular power supply				
3	Curriculum is not ICT compliant				
4	Poor management of SIWES				
5	Lack of relevant knowledge in electrical/electronic technology				

6	People prefer to do repairs themselves than to hire technicians				
7	Obsolete knowledge and skills in the curriculum				
8	Lack of entrepreneurship skills in electrical trade				
9	Electrical tools and equipment are not readily available				
10	High cost of land and rent to set up shop				
11	Curriculum is not particularly meeting the demands of the outside world				
12	Lack of courage to start up the business				
13	High cost of electrical tools and equipment				
14	Unnecessary demands by financial institutions in giving loans and other facilities				
15	Inadequate skills in electrical trade				

SECTION C

3. What are the strategies to be adopted for the upliftment of technology education for self-employment in electrical and electronics technology?

S/NO	ITEMS	SA	A	D	SD
1	Number of classes/workshops should be increased				
2	Number of students per class should be controlled				
3	Workshop practice should be made compulsory				
4	Individual participation during practical should be encouraged				
5	Learning should be student centered (majority of learning activities should be carried out by students themselves)				
6	Instructors should be more active than students				
7	Better take-home-packages for staff				
8	Old instruments/equipment should be discarded or replaced				
9	Workshop supplies should be regularly restocked				
10	Funding to technical colleges should be reduced				
11	More instructors (teachers & technologists) should be employed				
12	Regular training and re-training (workshops/seminars) for staff should be encouraged				
13	Unnecessary policy change on technology education by successive governments should be controlled				
14	Lesser theory and more practicals should be considered				
15	Visit to industry (field trips) should be increased				