SKILLS GAP ASSESSMENT TO ENHANCE THE DELIVERY OF TECHNICAL AND VOCATIONAL EDUCATION: A CASE STUDY OF ELECTRICAL INSTALLATION GRADUATES IN OGUN AND KADUNA STATES OF NIGERIA

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DECLARATION

I declare that this thesis presented by me entitled 'Skills Gap Assessment to Enhance the Delivery of Technical and Vocational Education: A Case study of Electrical Installation Graduates in Ogun and Kaduna states in Nigeria' is my own investigation and has not previously been submitted for a degree or similar award at the University of theWest of England or any other institution. To the best of my knowledge and belief, no material in this thesis has been previously published or written by another person, except where due reference is made.

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Signed…….

Date…….

ABSTRACT

Nigeria requires an efficient and a capable skilled workforce to manage the construction industry. The workforce comprises the engineers, technicians and the craftsmen from Nigerian universities, polytechnics and technical colleges. The importance of the skilled workforce cannot be overemphasized as it contributes immensely to the social and economic development of the country. The continuous growth in and expansion of this industry in Nigeria have led to exponential growth in positions that requirecertain technical skills. However, finding workers with the requisite skills remains a major challenge for employers in Nigeria. Employers have expressed concerns about the lack of adequately trained technical college graduates and feel that educational institutions under Technical and Vocational Education and Training (TVET) are not producing graduates with skills that match the needs of industry.The aim of this research is to create a measuring and mapping framework to address the construction skills gap through improved technical and vocational education with reference to the challenges inherent in the Nigerian electrical installationeducation programme.

The pragmatist philosophy and sequential exploratory mixed method were adopted in order to fulfil the research aim and objectives. During the early stages of the study, data were collected through focus group discussion with the electrical zonal education officers, electrical installation instructors and electrical installation heads of departments of technical colleges both in Kaduna state in Northern Nigeria and Ogun State in Southern Nigeria.Locales in northern and southern Nigeria were considered, due to previously reported educational disparity between the northern and southern parts of Nigeria in the extant literature.

Their views were sought through six focus group discussions for the qualitative phase of the study. For the quantitative phase, a questionnaire survey was administered to electrical installation contractors.

The key findings from the study indicated that the technical college institutions in Ogun and Kaduna states in Nigeria, faced problems with regards to their role in the provision of knowledge and skills.The study identified that skills gap exists among the skilled workforce in soft skills which comprises of thinking ability, reading skills, written communication skills, leadership skills, negotiation skills, time management skills and core skills for learning.Gaps were found in curriculum as it was out of date. Additionally, there is a lack of facilities and equipment needed for teaching and learning. The gap that exists could be addressed and improved by training and retraining the skilled workforce, introducing apprenticeship training and to make sure that the electrical installation programme curriculum is reviewed, with a view to make training more relevant to the needs of the construction industry.

The findings of the study wereused to develop a framework which was validated via a survey which indicated that the framework is valuable and suitable for use in practice since the research shows that most of the respondents accepted the research findings and recommendations for success.

This research offers recommendations that will assist the industry, schools and public at large in resolving issues on skills gap assessment in Nigeria.

DEDICATION

To Almighty God,who has made it possible for me

to complete the programme

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LIST OF ACRONYMS

ANBC	Advanced National Business Certificate
ANTC	Advanced National Technical Certificate
ACT	Acceptance and Commitment Training
ASTD	American Society for Training and Development
BEC	Basic Education Certificate
CGLI	City and Guilds of London Institute
CIOB	Chartered Institute of Builders
CEDEFOP	Centre European pour le development de la formation Professional
CITB	Construction Industry Training Board
CTE	Career and Technical Education
FCTC	Federal Craft Training Certificate
FRN	Federal Republic of Nigeria
GDP	Gross Domestic Product
IGSCE	International General Certificate of Secondary Education
IT	Information Technology
JSC	Junior School Certificate
LGAs	Local Government Areas
MDGs	Millennium Development Goals
NABTEB	National Business and Technical Examination Board
NBTE	National Board for Technical Education
NBS	National Bureau of Statistics
NECO	National Examination Council
NERDC	Nigerian Educational Research and Development Council
NPE	National Policy of Education
NVQF	National Vocational Qualification Framework
OE	Occupational Education
PBL	Problem-Based Learning

PVE	Professional and Vocational Education
RSA	Royal Society of Arts
SSCE	Senior School Certificate Examination
TE	Technology Education
TE	Trading Economy
TVE	Technical Vocational Education
TVET	Technical Vocational Education and Training
UBE	Universal Basic Education
UK	United Kingdom
UN	United Nations
UNESCO	United Nations Educational, Scientific & Cultural Organization
UPE	Universal Primary Education
WAEC	West African Examination Council
WASCE	West African School Certificate Examination
WE	Workplace Education
U.S.A	United States of America
UNESCO	United Nations Educational, Scientific & Cultural Organization
VEIs	Vocational Enterprises Institutions

Chapter 1 : INTRODUCTION TO THE STUDY

1.1 Background to the Study

In the last decade, skills gap has become an important matter for discussion in construction industryin the wholeworld (Shah and Burke, 2003; Trendle, 2008). Developed countries like United Kingdom, United States of America, Germany, China, Australia and host of others still complained about issue of skills gap among their skilled workgroup, as it impede and threaten their economy due to some factors like, construction workers lack of appropriate training, workers being new on the job role and some other factors (Ofori, 2000; Shah and Burke, 2003) that debar the progress of the industry.

Skills gap issue affects construction industry in the whole sphere, of which construction industry in sub-Saharan Africa were not an exemption, they were complaining about the incompetence of their labour workforce (Jonathan & Eric, 2009). Developing countries like Benin, Egypt, Libya, Algeria, Ghana and Nigeria among others were complaining about how issue of skills gap affected the economy of their various countries (Jonathan & Eric, 2009). In the sub-Saharan Africa employers across the region already identify the gross inadequate skilled workforce as a major constraint to their businesses.

In Ghana, the issue of skill gaps among craftmen have been well documented (Edum-Fotwe, 2006). In Ghana skills gap among the craft workforce cuts across a range of market sectors like construction, hospitality industry, manufacturing, mining to mention few (Anderson, 2008). For construction industries in Ghana, skills gap issues are real and potentially harmful to the industry. The Ghanaian government is involved in tackling the issue of skills gap among the workforce due to its consequent implication on the industry and their community at large.

Similarly issue of skills gap among craft workers is widely known in Zambia (Muya et al., 2006). Construction industry and other related industries have been complaining of the lack of required skills by craft employees in Zambia

(Muya et al; 2006). This has caused the Zambian government to critically look into education and training guiding the TVET program in Zambia.

Similarly, it has been well documented, that the construction craft skills training in Zambia have not been adequately funded. These had resulted into many factors hindering the training of the craft workforce, namely: out of date curricula of construction craft program, poorly maintained infrastructure and unequipped workshop facilities for teaching purposes (Muya et al; 2006). Other factors include training mismatch and ineffective apprenticeship programmes, underinvestment in education and training and outdated training programmes in skilled workers in Ghana, Togo and some Sub-Saharan African (SSA) countries (King, 2009). Moreover, the challenges in the supply of skilled workforce as a result of skills gaps in Ghana and SSA countries has hampered varied firms ability to find skilled labour across industries (Desmond Tutu Ayentimi et.al 2018; Nana Arthur- Mensah et.al, 2018; King, 2009)

Similarly, it is general knowledge, that Nigeria is also faced with lack of skills development among its skilled labour workforce, especially the craft men. Hence, the issue of skills gap is of key importance most especially in the Nigerian construction industry. This has observed by Awe et al., 2014, has had adverse effect on the construction industry in area of production and workforce (especially among craft men, who are graduates of technical college in Nigeria).

In sub-Sahara Africa and the developed world, construction industries have established Skills gap. Hence, there exist gaps of incompetence among the labour workforce of construction industries in sub-Saharan Africa Developing countries like the Republic of Benin, Egypt, Libya, Algeria, Ghana and Nigeria among others have established in the literature how issue of skills gap affected the economy of their various countries. Similarly, Nigeria also recorded skills gaps among its skilled labour group of workers and craft men.

Thus, the issue ofskills gap cannot be over emphasised as it has become key and very importance most especially in Nigerian construction industry. This has been observed to have adverse effect on the industry in area of production and its workforce. This affects mostly the craft men, who are the graduates of technical college in Nigeria (Awe et al.,2014; Baqadir et al., 2011).Consequently, the society at large has the conviction that graduates of technical college does not have the ability and instruction in terms of skills acquisitionas required for the demands of the construction industry. Therefore, Oketch (2007) and Jayaram &Engmann (2017), emphasised that employers have complained about the training and instruction acquired by the secondary school graduates. The duo noted, that such instructions and training are grossly insufficient to meet the demand of today's construction industry. Subsequently, Jayaram &Engmann (2017), highlighted the fact that neither the secondary education nor the vocational training schools is equipping the school leavers with the key instructions and abilities needed for work. Similarly, Olaitan et al. (2000), complained that senior secondary students (Technical) lack the required skill to work in industries.

The stakeholders and the general public at large in Nigeria have complained about the graduates of technical college who are the major skilled artisan manpower of the industry. The complaints centered around unsatisfactory performance and expertise requirement at the workplace (Ogwo and Oranu, 2006; Awe *et al*., 2010). Hitherto, one of the problems and requirements of the construction industry in Nigeria, is that of skills gap among its workforce (Ofori, 2004).

Technical Vocational Education and Training (TVET) have been identified as an instrument that can help resolve the skill technicalities within the Nigerian construction industry. The Technical colleges in Nigeria are saddled with the responsibility of training skilled craftsmen for three-year in different disciplines. Students thereafter, graduate with a Federal Craft Training Certificate (FCTC) which qualifies its graduates for opportunities employment in their various construction workplaces.

In line with the aforementioned, Jayaram &Engmann (2017) reiterated, that skills could be learnt either in a formal or informal setting and the duo laid emphasis on TVET as an aspect of training institution that inculcates skills development, knowledge, and attitudes which cover the affective, psychomotor and cognitive domains; such that the students produced will be employable into the industry as a result of the training and skill acquired (Awe et al., 2010; Olaitan et al., 2000). Evidence from reviewed literature revealed that inadequacies in TVET are responsible for the skills gap at the craft level (Oni, 2007). TVET is thus, partially responsible for the mismatch which exist between the skillscraft trained and the skills required for employment at the construction industry. This is what economist refers to as a variation between supply of and demand for human capital. Majority believed, that the problem of skills gap will continue to escalate as the jobs available in the construction industry become more technical; and the rate at which this is changing is quite alarming. Consequently, it is required that employees acquire adequate skills training that will make them employable in the workplace (Smith, 2003; De Grip and Van Loo 2002; Awe, 2010). Evidence suggest, that, education and training has reduced in quality and cognitive skills have remained steady, while job training requirements have escalated exponentially (Olaitan; 1996). Employers expressed dissatisfaction with the efforts level and work attitudes of young technical graduates And skilled artisans are the backbone of the construction industry both in the developed and developing countries of the world (Odusami*et al*., 2003; Oloyede *et al*., 2010; Olusegun and Micheal, 2011).. The workforce is employed to carry out the skilled labour ranging from plumbing works, block laying, carpentry, electrical installation and some other building related works. Recent studies highlight low levels of skills training among the skilled craft workforce in Nigeria and a decrease in construction training compared to other developed countries of the world (Awe, 2010; Olaitan *et al*., 2000; Oni, 2007)

Training institutions are constantly employing innovative pedagogies to their skilled workforce for sustainable development of the construction industries and such is currently been embraced by major organizations (Ogwo and Oranu, 2006). A search for ways to ensure that graduates gain the appropriate skills to meet employers needs in the construction industry may not only improve workplace performance but can also lead to more responsive and sustainable technical education policies that can address individual and national needs.

For instance, Ofori (2004) and Lewin (2006), among others highlighted that, improving quality and raising skills levels and standards for training may not only lead to higher wages and higher returns but may impact individuals, employers, and the entire nation.

1.2 Problem Statement

There have been various accusations, about the qualities of graduates produced in most technical training institutions in Nigeria. For instance (Olomolaiye and Ogunlana, 1989; Awe, 2010;Muya et al., 2006) observed that most graduates of technical institutions in Nigeria are not skilled enough for employment in industry and commerce. In practice, demands for adequately trained technical graduates with appropriate skills to meet workplace challenges indicate that the availability of those graduates is extremely important to employers. Despite high demand for skilled artisans, the public have noted that graduates of technical colleges are greatly unemployed because of in-ability to acquire the required skills and training required for employment (Olaitan *et al.,* 1999*).* The industries in Nigeria complained that Technical Vocational Education(TVE) graduates do not possess the required skills and training for employability and that they lack assurance in discharging their duties and obligations as required by the industry (Olaitan *et al., 1999).* This may be attributed to insufficiency and in appropriate of educational training facilities (Olaitan *et al., 1999)* and this

stands to be a contributory factor for not improving the quality of TVE graduates.

This has created a skills gap needed for employment and as reiterated by Ochiagha (1995) skills acquisition in various trades appears to be one of the surest ways through which young people can find their way into the labour market, be it public or private industry.

1.3 Gap in Knowledge and Justification for the Study

One of the major challenges facing Technical Vocational and Educational Training (TVET) programme is that, their graduates are facing the problem of unemployment (Oketch, 2007). Prevailing literature, such as Jayaram &Engmann (2017) and Oketch (2007) stressed that unemployment among these set of graduates was due to the fact that the graduates are not well trained to meet up with the requirements of the job market. The challenge of imparting the right skills in area of cognitive, employability, academic and soft skills are still lacking in these set of graduates (Jayaram &Engmann, 2017). These are the set of skills that will assist the graduates in their respective workplaces.

However, there is limited research on skills gap in Nigeria, this area is yet to be explored, although this study has been devoted to measuring the skills gap and mapping the skills gap with the curriculum guiding the programme in other to identify area of deficiency in the program and to remedy the challenges. The gap in the knowledge limits the ability of the decision makers, policy makers from making decisions. The findings of this investigation would help to remedy the effects, causes and implication of the phenomenon understudy, such that it will not affect the stakeholders and the society at large.

1.4 Aim and Objectives

The purpose of this research is to create a measuring and mapping framework to address the construction skills gap through improved technical and vocational education with reference to the challenges

inherent in the Nigerian Electrical installation programme in Ogun and Kaduna states.

To accomplish the aim, the following objectives will be achieved:

1. Understanding the theoretical underpinning and state-of-the-art practice in identification of skills gap in academic, generic, technical, practical and employability skills required for employment in the construction industry.
2. To establish a framework for the measurement of skills gap in construction industry.
3. To design a framework to examine the curriculum of TVE with a view to map the curriculum with the gap.
4. To design research tool to collect and subsequently interpret data.
5. To validate findings of the research through stakeholders' perspectives
6. To draw conclusions and make recommendations to address the gaps within the TVE in the construction industry

1.5 Research Questions

1. What are thedesirable skills that are in demand by the industry?

2.What methods will be adopted in measuring the skills gap?

3. How does the curriculum of vocational education in area of electrical installation satisfy the skills demand of the construction industry in terms of graduate students performing professional duties and responsibilities as needed?

1.6 Scope and Limitation

The aim of this study is to examine the skills gap and create a measuring and mapping framework to address the construction skills gap through improved technical and vocational education in Ogun and Kaduna States in Nigeria. The disciplinary and geographical scope was specified to be for electrical installation programme in the northern and southern part of Nigeria. Therefore, data was collected from key stakeholders, such as, constructors, and technical education instructors.

Nigeria is a country that is divided into six geopolitical zones, which consist of states with similar cultures, history, background and close territories. This study has only considered two out of six geopolitical zones in Nigeria, because of educational disparity that exist between the northern and southern zone (Fafunwa, 1974;Okobiah, 2002; Raheem et al 2014), time constraint and financial resource constraints.Even though skills gap cuts across all industries, the study concentrated on theconstruction industry only.

1.7 Significance of Research

The Nigerian construction industry have complained about TVE graduates not possessing adequate practical and technical skills required for work in the industry (Odusami*et al*, 2003; Oloyede*et al*, 2010; Olusegun and Micheal, 2011). Thus, the issue of skills gap among the craft workers in the construction industry has become a global challenge. The problem of shortage in both hard and soft skills is being reported by the construction industry to cause skills deficits (Ofori, 2004). Also, it is commonly known that skills gap among such skilled workers affects the productivity of the industry (Olomolaiye and Ogunlana, 1989; Awe, 2010; Muya et al., 2006). It is, therefore, essential that research is carried out not only to provide solution to the issue of skills gap but to equally intimate the construction industry professionals, education professionals with recent knowledge and guidelines for reducing skills gap in order not to cause delay and unproductive work within the industry.

This study is designed to inform instructors in technical colleges in Nigeria to understand areas of weaknesses in the curriculum and be able to train students better. The greater demand for graduates coupled with skill deficiencies background justifies the need for effective life-changing teaching approaches.

The result of the study will help in the consideration of all activities that are necessary to plan and develop technical institution curriculum that will provide the kind of skilled workforce needed in Nigeria.

The findings of the study when implemented would help electrical installation technical college graduates to develop industry-relevant skills thereby making them ready for the job market.

Previous studies on skills gap have been carried out using qualitative method, focus group discussion and thematic procedure for the analysis (Baqadri et al., 2011; Dainty et al., 2004; Sodhi, 2014; Makori, 2005). Mostly, past researchers have been identifying skills needed by the industry theoretically without mapping the curriculum to industry needs (Baqadri et al., 2011; Dainty et al., 2004; Sodhi, 2014; Makori, 2005). They mainly investigate the skills needed by the industry without providing a framework for measuring skills gap. This investigation building on existing research contributes to the body of knowledge developing a framework for both the measurement of skills gap and mapping of the curriculum to the industry need.

1.8 Summary of Research Methodology

The research paradigm embraced for this study is based on pragmatism worldview. It allows the use of both quantitative and qualitative research methods. Pragmatism is connected with mixed method and it holds a different view to that of positivism and post positivism, pragmatism is adopted mainly because it is compatible with mixed method, it has interest in ‘what is’ and ‘why questions’,universally as the philosophy of vocational

technical education is multifaceted, it allows the use of mixed methods being used for this study.

Various techniques were adopted in collecting and analysing data to accomplish the aim and the objectives of this research. The investigation required data collection, which involved the use of literature review, focus group discussions and questionnaire survey. The analysis of the research was carried out using descriptive and inferential statistics by applying Statistical Package for Social Sciences (SPSS) Version 24.

Figure 1.1 represents the schema chart for the study. Sample of the questionnaire administered for the research is available in Appendix 1. Methodological means applied in achieving the research objectives are clarified in the following sub-sections.

1.8.1 Methodology: Objective 1

Objective: *Understanding the theoretical underpinning and state-of-the-art practice in identification of skills gap required for employment in construction industry.*

1) Extant literature was thoroughly reviewed to determine the requirements of the construction industry in terms of construction skills required for employment
2) Further study on review of the literature was carried out on skills gap in construction industry and curricula guiding electrical installation programme
3) The work done by other researchers in identification of skills gap and skills required were interrogated enabling the state-of-the-art literature to be formed.

1.8.2 Methodology: Objective 2

Objective: *To establish a structure for the measurement of skills gap in constructionindustry.*

1) Insight from the literature review revealed the skills to measure and this brought about the development of a structure for the measurement of skills gap.

1.8.3 Methodology: Objective 3

Objective: *To design a framework to examine the curriculum of TVE with a view to map the curriculum with the gap.*

1) Based on the review of the literature an In-depth study of the curriculum was undertaken to present a clear perception of the content of electrical installation in order to enable the establishment of gaps between the curriculum and the skills needed by the construction industry.
2) Based on the review of the literature a structure was designed to examine areas of skill gap in industry in order, to determine whether the curriculum of TVE constitute the skills needed by the industry.
3) Using the outputs of the literature review, framework was designed for focus group. Focus group discussions were carried out with electrical technical instructors, electrical education officers, face to face to seek for their opinions, perceptions and concept of electrical vocational technical education curriculum in relation to skills gap experienced in the construction industry. This gives an insight to where the skills gap exists in the curriculum.

1.8.4 Methodology: Objective 4

Objective: *To operationalise the frameworks through collection and analysis of data*

1) Data were collected for the purpose of testing the measuring and mapping framework within electrical installation programmes.

2) In achieving the stated objective, a focus group discussion was conducted between six and eight VTE technical instructors in order to obtain their opinions, perceptions and concept of vocational technical education curriculum.
3) Subsequently, a survey using questionnaire was conducted using to obtain data from electrical installation contractors regarding the skills gaps.
4) The focus group discussion was analysed using thematic analysis while the questionnaire data was analysed using descriptive and inferential statistics.

1.8.5 Methodology: Objective 5

Objective 5: *To validate the appropriateness of the frameworks to inform curriculum design in TVET.*

1) Discussions were held within some participants of the focus group, particularly electrical installation programme heads of department, order to find out if both frameworks are found helpful in measurement of skills gap and in mapping the curriculum with the gap.

1.8.6 Methodology: Objective 6

Objective 6: *To draw conclusions and make recommendations.*

1) Conclusions and recommendations were made based on the findings of the research. Overall, the findings of the study provide critical information regarding the confirmation of skills gap existence and its measurement coupled with mapping the curriculum with the gap.

1.9 Framework of the Thesis

This thesis is comprised of eight chapters, starting from the introduction to the conclusion as shown in Figure 1.1.

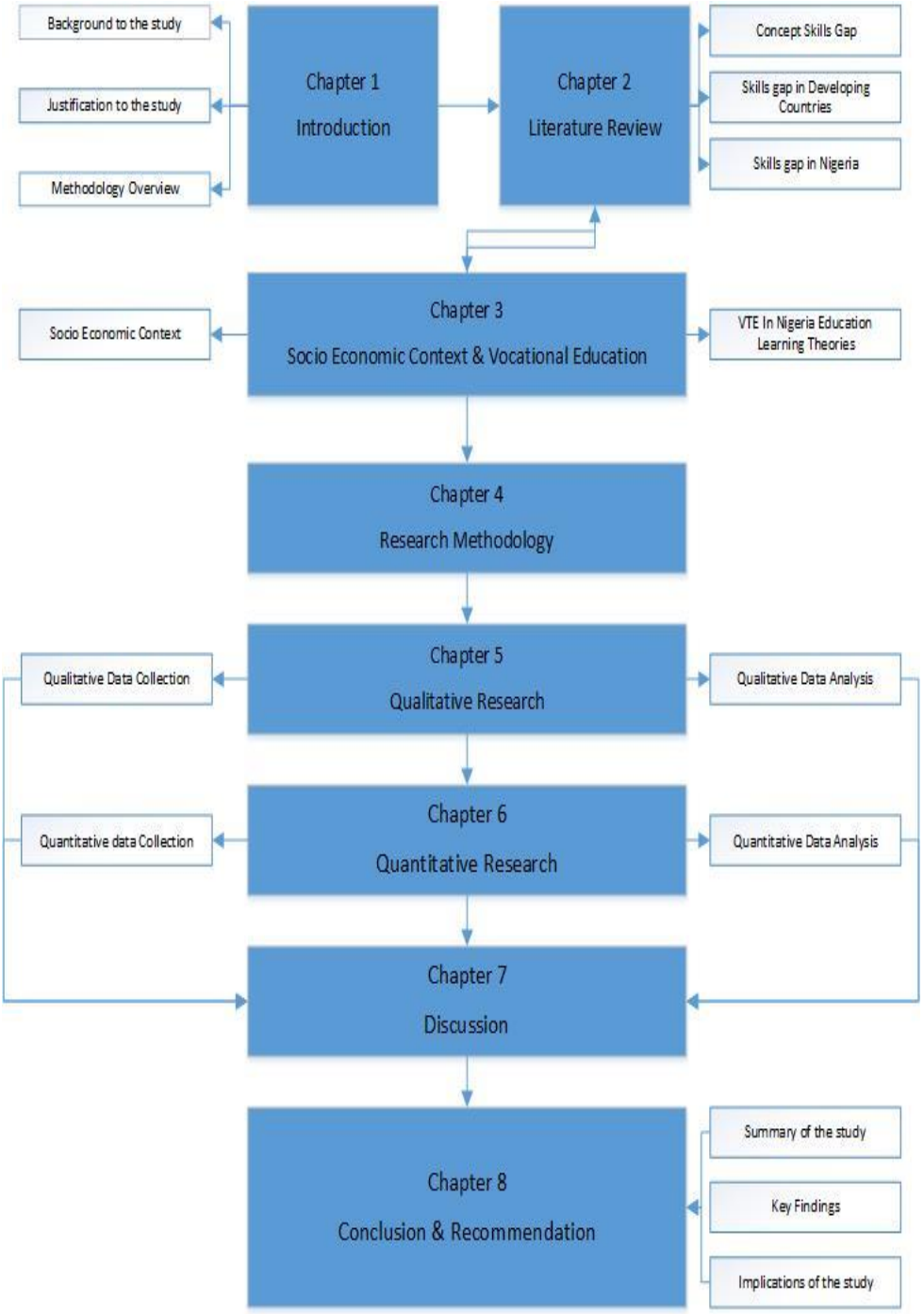

Figure 1-1: Thesis Structure

Chapter 1 comprises of: background, the problem statement, gap in knowledge and the justification for the study. The first chapter also highlights the aim and objectives of the study, the scope and limitation, summary of research methodology, structure of the thesis and the definition of terms.

Chapter 2 presents macro and micro literature review of skills gap among the craft workers. It highlights skills gap among the developed and developing countries, the factors causing skills gap, the evidence of skills gap in Nigeria and its implications.

Chapter 3 presents a review of education and training in Nigeria, educational system and educational learning theories guiding vocational technical education (VTE) and curriculum guiding electrical installation to industry need.

Chapter 4 outlines the methodological approach to the study, including research philosophy, research strategies and research methods.

Chapter 5 This chapter presents the findings of the qualitative inquiry. Thematic analyses procedure was applied in order to present the respondents view, explanations and opinions of the research problem at hand.

Chapter 6 presents analysis of the quantitative method. The analysis was carried out using descriptive and inferential statistics with the aid of SPSS software version 24.

Chapter 7 presents the discussion of both qualitative and quantitative findings.

Chapter 8 provides a concluding remark for the study. Chapter eight gives a brief layout of the aims and objectives guiding the study, of the research, and finally the limitations of the research and recommendations for further studies.

1.10 Definition of Terms

The following terms have been defined to give a clearer picture and better understanding of the content as discussed within this study.

Apprenticeship: Apprenticeship is a form of training acquired under an expert in a specific trade for a period, which attract certificate at the completion of the training (Muehlemann et al, 2009) .

Assessment: Assessment is an instrument used by the teacher to measure; assess the performance, learning progress, understanding and educational needs of the learners in institution of learning (Black &Wiliam, 1998; Kahl, 2005; Wiliam, 2010).

Basic Education: Includes primary education through junior secondary school (Aluede, 2006)

Federal Craft Certificate (FCE): Certificates awarded to graduates of technical college.

Federal Ministry of Education (FME): Ministry responsible for education in Nigeria.

Curriculum: The totality of planned experiences needed for training in a program of study (Tyler, 2013)

National Board for Technical Education (NBTE): The NBTE is a principal body controlling technical education sector in Nigeria.

Senior Secondary School (SSS): Education after junior secondary school

Skill: The ability to carry out a skilled task competently (Kayode, 2009). Not limited to trade and crafts acquired through competencies (Gregory, 1987).

Skill Gap: A skill gap is the shortage in performance (Kayode, 2009). It is the difference between skill required by the industry and the current skill acquired by the craft worker.

Technical Education (TE): Technical education is the preparation of students to become technicians in area of applied sciences and knowledge that deals with technology (Okoro, 1993; Okoye&Arimonu 2016)

Technical Vocational Education (TVE): ''Are those aspects 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 various sectors of economic and social life'' (UNESCO, 2001)

Technical Vocational Education and Training (TVET): The purpose of TVET is to train students to acquire technical skills and provide knowledge for employment or self-employment. It delivers its instruction through training institutions (Okoro, 1993; Okoye &Arimonu 2016)

Vocational Education (VE):This is education that prepares individuals for employment in industries forvariousoccupations (Okoro, 1993; Okoye &Arimonu 2016)

Advanced National Technical Certificate (ANTC): This is a technical certificate awarded to those who passed all the courses offered at the advance class, it is higher than the intermediate certificates (Olaitan et al., 2000)

Advanced National Business Certificate (ANBC): This is advanced business certificate offered to those who passed all courses offered in advance class (Olaitan et al., 2000)

1.11 Summary of chapter one

Chapter one discussed the issue of skills gap among the construction companies in Nigeria. The issue of skills gap has become a global issue, and it is a major issue among the construction companies in Nigeria, as the industry complained about the technical college graduates being deficient in their area of expertise, and lack the skills required for employment. They were not well prepared for the world of work, this could be attributed to some factors such as the out of date curriculum, lack of equipment and facilities amongst other things.

The aim and objectives were set in order to address and remedy the challenges facing the employers, from these set of graduates, frameworks were designed to measure the skills gap and to map the curriculum with the gap in order to identify areas of deficiency in skills and to know how wide the skills gap in skills is identified. The next chapter discusses the issue of skills gap in construction industry among the craft workers in Nigeria.

Chapter 2 : LITERATURE REVIEW OF SKILLS GAP IN CONSTRUCTION INDUSTRY AMONG THE CRAFT WORKERS IN NIGERIA

2.1 Introduction

The Construction industry requires a skilled workforce, as skill is a requirement for discharging duties relating to each specific role at the workplace, (Clarke & Winch, 2006; Taylor, 2005; Markes, 2006) and that has been considered essential in construction companies worldwide. Lack of adequate skill among the industry workforce particularly the craftmen has become a great challenge to the Nigerian construction industry, as the lack of skill has caused poor quality of work, low productivity, delays in project delivery among others (Megudu et al., 2011). The need for adequate and relevant skills among the construction workforce is well established (Egbu, 1994; Odusami et al., 2003).The skill of a craftsman entails all he requires to meet his work responsibilities (Bilau, et al., 2015), it has been established and acknowledged, that skills do not only signify competence, but also add value to professional image of the industry.The lack of adequate craft skill acquisition among this group of workers, has led to the recruitment of migrant craftmen for construction projects, a very large number of Chinese artisans are on contractual obligation currently in most African countries, a very large portion of the artisans were recruited in Nigeria to work in construction industry (Ihua-Maduenyi, 2015).

2.2: Definition of Skill

''Skill'' is defined as ''the ability to competently perform a particular task assigned'' (United Kingdom Commission Employer Skills Survey, 2010) or to perform ''a specified task at a certain level of expertise'' (Shah and Burke, 2003; Trendle, 2008). Similarly, a 'skill 'can be described as '' the capability to carry out job assigned to a level of competenceand this can be built upon through learning'' (OECD, 2011). Within the construction industry, skill therefore is an activity involving knowledge, judgement, accuracy and mastery, all of which are acquire as a result of long training and practice in a

workplace (Odusami, 2002; Awe, 2010). The concept of skill has been defined differently by writers in different forms. Skills could also be looked into from another perspective as being expert in area of specialisation (Wood, 1988), having competence (Boyatzis et al, 2002; Olaitan et al, 2000) dexterity and knowledge of the workforce (Awe, 2010; Mangham and Silver, 1986). In the same vein, due to some school of knowledge skill, is a special ability to perform duties, majorly acquired through formal or informal training (Tether et al, 2005). Definition of skill according to some school of thought should entail the ability of the skilled artisan to work in various section of the industry or the workplace independently (Spenner, 1983; Olaitan *et al.,* 2000). It could be termed as capability to carry out jobs perfectly without supervision.

Overwhelmingly, a skill, and various types of skills within the literature are linked to an activity or a job (Clarke and Winch, 2006). As skill is linkedwith a particulartask, a person who does not have skill is unlikely to be able to carry out a given job or will be less productive than somebody who possesses the skill. Skills are often linked and have some alliance with qualifications (Mawer& Jackson, 2005; Sattinger, 2012; Cappelli, 2014) and acquisition through formal education and training which is adequate in quality and quantity.

Construction skills and training needs are continually changing. These alongside with the introduction of new business processes, organizing production and technical and vocational innovation which require the construction workforce to be more highly skilled in their various areas of expertise (Spenner, 1983; Mackenzie *et al*., 2000; Forde and MacKenzie, 2004).

2.3: Classification of a Skill

Skills could be classified into few different ways, though skill have many characteristics. In this study skills could be classified as been generic, technical skill or Non-technical skill and hard skill (Ofori, 2004). Other skill categories include academic and cognitive and employability. Particular skills can be classified under a number of different skill types since these are overlapping categorisation with varying relevance for specific job sector or roles. The classification will be discussed in this section with a view to creating a categorisation relevant for measuring skills in the construction industry.

2.3.1 Academic or Cognitive Skills: These are basic academic skills needed to support learning in different subjects such as physics, English, mathematics and biology among other subjects. Most importantly, it is mandatory for all secondary school students to have academic skills in other to further their education in higher institutions of learning. These subjects are learned in school and it should be transferable to applications where needed. They are assessed using standardized test (Jayaram & Musau, 2017).

Be that as it may, for graduates of technical training institutions to gain employment into the world of work or the construction industry, courses offered including the construction skills should be reviewed and updated. Employers in construction industry referred to some courses in which students are deficient to include communication skill, English, physics and host of other subjects which needed to be transferred for use in the real context, in writing letters and memos and other areas that needs calculation while on the field. Students should be well equipped in academics, in other to be able to interpret and use what they have learnt in the real context. It is well noted that deficiencies in mathematics and English affects graduates in solving statistical and mathematical problems where needed in construction works (Kearns, 2001; Jayaram & Musau, 2017).

2.3.2 Generic or Specific Skills

This is a combination of skills that deal with problem solving, communications, or team work. The combination of these skills are applicable for use across all jobs and are meant for use in all situations and across disciplines (Kearns, 2001; Pumphery, 2001). Other names for generic skills include general skills, key skills, employability skills, key competencies, core skills, necessary skills, transferable skills and essential skills. They are equally transferable across work settings. Generic skills have meaning in different work context (Stasz, 2001).

Generic skills are multifarious in nature. They consist of analytical skills which is problem solving, (i.e. the ability to both formulate a problem and execute what is required to solve the problem), communication skills (i.e. the written presentation that require ability to communicate in writing in an effective manner and in different formats and for various types of recipients as well as, the oral presentation, which is to communicate, verbally in an effective manner for presentation for and at different groups and audience), and information skills (i.e. having the ability to know that there is a need for a certain type of information to complete a task, like information retrieval and information evaluation). The social and ethical skills entail the ability to carry out the duties alone without supervision autonomously, and the ability to work with others in a group or in a teamwork, and finally having the ability to apply ethical judgement in various societal issues arisen from your workplace (Sorrel, 2017).

The importance of generic skills is known all over the globe, it is well noted for use across disciplines and workplaces. Majorly technical and vocational education imbibe the use of generic skills in disseminating instructions to students, moreover all educational training institutions and workplaces passes instruction and use generic skills in daily routine of work-done and in real life situations. (Singh, 2015)

2.3.3 Technical Skills

These are specific skills for use across professions which are technical in nature, to include academic subjects like mathematics, physics, chemistry, biology and other subjects applied in different programmes like, mathematics applied in plumbing works, physics applied in electrical installation with respect to equipment's and facilities (e.g. operation of a switch gear). Technical skills are defined as those skills acquired both at formal and non-formal institution of learning relating to the profession of one's choice as an apprentice, in the replica of the workplace for employment (Litecky et al., 2004). They are always coded in job description and they are measured using standardized assessment (Sorrel, 2017).

Technical skills are skills meant for an occupation in which the skilled worker has competency in his area of discipline or related profession which require the use of tools, in technical or engineering field (Medina, 2010). Technical skills issues relating to the use of equipment's and tools meant for work and related issues are linked with technical skills. This could be learnt in educational training institutions and non-formal settings (Handler & Healy, 2009).

2.3.4 Soft-Skills

Having possess soft skills are part of requirement that makes you qualified to successfully work as part of a growing industry. Soft skills are defined as an array of person's attributes and way of life to include goals, skills possessed, friendliness, reasoning, and motivation that makes an individual in life (Sorrel, 2017; Litecky et al., 2004). Soft skills entail work ethics, attitude, and communication. It could be referred to such construct as motivation and dispositions (Jayaram &Musau, 2017). Soft skills could be evaluated using questionnaires and through individual impression.

2.3.5 Employability Skills

These are set of skills acquired by individual in order to gain employment into a workplace. These skills are used for the development of oneself and for gaining employment into the world of work, these set of skills makes you to be successful and becomes competent in your field of discipline (Robinson, 2000). These skills could be acquired through formal and non-formal training institutions, the purpose of employability skills are numerous, part of which are to gain employment and also to make contribution to the development of the workplace, possessing employability skills is an advantage, it gives edge to who possess it during promotion exercise than other counterparts who does not have it (Curtis & McKenzie, 2001; Bridgstock, 2009). These skills comprises of some attributes employers are looking for in graduates looking for employment, they include communication and interpersonal skills, working under pressure and to deadlines, problem solving skills, initiative and self-motivation, numeracy, team working, negotiation, ability to learn and adapt and valuing diversity and difference, though these attributes differ from one workplace to another. These attributes if possessed by an employee is useful for all and sundry, even though these skills are found lacking in most graduates looking for employment and those already engaged in employment (Dacre Pool and Sewell, 2007).

Employability skills are divided under two, headings namely: interpersonal skills and generic employment skills. The aforementioned skills,fall under these two categories and they are meant for use bothin industry and in the newly recruited graduates. Newly recruited graduates are found to be deficient in employability skills, it is therefore, imperative to include these skills into the school curriculum (York & Knight, 2006; Cranmer, 2006). Generally, most employers and organizations are looking for employees who possess the attributes of employability skills (Bagshaw, 1996; Sorrel, 2017; Jayaram & Musau, 2017; Jayaram & Engmann, 2017). It was observed that the requirements of the industry in terms of skill requirements kept on

changing due to technology development, this suggest that education and training should look into the curriculum and review or make changes so as to include employability skill into the new curriculum (York & Knight, 2006; Cranmer, 2006).

2.4: Skills Demand by construction Companies in Nigeria

The employers in the construction industry are looking for the skilled workforce with the right skills (Crowson *et al*., 2000; Jayaram &Engmann, 2017) and qualities to contribute to the development and success of the industry. Skills identified by the construction industry to be of importance include, academic or cognitive skills, generic skills, technical or vocational skills and work-related attitudes or soft skills (Stasz, 2001).

Construction companies in Nigeria found out that students of technical college are found deficient in some skills (Odusami, 2002; Awe, 2010). The major skill gaps previously found in construction industry in Africa, most especially Nigeria are cognitive especially numeracy and critical thinking, non-cognitive especially communication, leadership, and decision-making and technical skills among the craft workers (Jayaram & Engmann, 2017; Lututala, 2012; Odusami, 2002; Awe, 2007).

Overwhelmingly, employers believe that the theoretical knowledge acquired in the classroom is the tip of the iceberg and that, it is insufficient by itself (Jayaram &Engmann, 2017; Lututala, 2012; Odusami, 2002; Awe, 2010). It seems employers look for a varying mix of non-cognitive or technical skills. Interestingly, employers felt that institutions should deliver the fundamental skills for employability to technical college students, so that employers can then conduct on the job training that is specific to their needs (Jayaram &Engmann, 2017).

In similar vein, Ndoye & Walther, (2012), conducted a research which highlighted similar skills gap found in craft workers in Africa. These skills which are needed include communication skills, literacy, numeracy and

cognitive skills. Similarly, a focus group interview was conducted by the National University of Educational Planning and Administration (NUEPA) on curricular skills in South and South Asia on employers. The researchers focused mainly on four areas of perception of skills, requirements of general skills, possibility of acquiring skills at school and sector-specific skills gaps (Jayaram &Engmann, 2017). The key skills gaps identified are non-cognitive skills especially communication skills, leadership skills, honesty/ethics skills, teamwork, and flexibility skills.

Over the years, employers have increasingly complained about the craft skilled workers, their incompetence, lack of adequate skills and expertise in various soft skills needed in construction industry. The soft skills include team work, effective communication, recent workplace operation and critical thinking. These lacks of soft skills restrain craftsmen from exhibiting their full potential in area of performance to the organisation (Sorrel, 2017) Construction industry experts highlighted different skills lacking amongst most craft men these comprised of creative problem solving and flexibility skills, communication and teamwork skills (Davis &Csete, 1998; Olaitan, 2006; Akintoye, 2006; Jayaram & Engmann, 2017; Jagger & Connor 1998;). Hudson, (2000). Manson *et al*. (2009), however, identified technical and practical skills as the most deficient skills within the United Kingdom (UK) construction industry

Besides these skills, technical college graduates must possess three fundamental characteristics skills (Love *et al*., 2001; Ogwo and Oranu, 2006; Jayaram & Engmann, 2017). Firstly,possession of practical experience is needed in other to intimate themselves with the working procedure and complexity of the industry. Secondly, they should recognize tools and equipment's used in construction industry, and then imbibe the spirit of collaboration in carrying out their jobs as expected of them in order to boost productivity and encourage good relationship among the co- workers. However, lack of collaboration in the construction industry has been

observed to lead to wasted time and poor performance. It is mandatory for construction skills workers to possess various mixture of skills required for work in the industry. These include business, personal, technical and employability skills meant to assist in daily routine at the workplace (Oranu & Ogwo 2006; Stasz, 2001; Jayaram & Musau, 2017).

2.5 Evidence of Skills Gaps in Construction

Skills gap according to (ASTD, 2012) is the significant marginal gap experienced between the industry initial competency level and the skills the industry needs to accomplish its objectives. This is a situation whereby the industry cannot fulfil its obligations to the society because they lack the skilled workers that supposed to work for the industry. It is evident to note that root problem of skills gap could be traced back to education and training (Chan & Dainty 2007; Gann & Senker, 1998). The relevant curricula and the teaching methods should be reviewed and updated in other to bridge the skills gap that exists.

Most of the developed and developing countries have been experiencing skills gap as perceived by the employers (Ofori, 1990). Skills gap in industry are identified as lack of qualified trained persons from the perspective of the employer. The gaps could be due to inadequacy in general education levels or due to inadequacy in general education levels and or due to inadequacy of technical skills. Skills gap is one of the pressing issues and concerns of industries throughout the world. Researchers has shown that skills gap is experienced by all the industries worldwide, it has become a global issue, ranging from construction, manufacturing, health sector and host of others (Aring, 2012). Skills gap is a problem that has been in existence for ages; it is not a new occurrence within industries and has always been a recurring problem over the ages (Aring, 2012; Ofori, 2004).

The 2010 World Economic forum report on talent mobility states that the world is facing a global demographic shock and skills gap. This is a global challenge that is so great that no single stakeholder can solve alone'' (Ofori, 1990; Aring, 2012). Globally therefore, the issue of skills gap has become a significant issue that affects industries across the universe in which no single entity can resolve the challenges alone (Ofori, 2004; Aring, 2012). Skills gap has become a global issue that threatens global economic growth (Aring, 2012). The global mismatch between skills and jobs, better known as ''skills gap'' remains a prevailing issue. The construction industry is facing difficulty in hiring skilled workers, which resulted into skills shortages hampering the production output of the industry and its business performance (Whittock, 2002; Ofori, 2004).

According to the Network Construction Skills, (2007), the shortage of craft skilled workforce has affected the construction industry in their inability to engage with the working principle of the industry in applying new technology. This however, has ever remained a big challengeto the industry in the area of technical and vocational skills, thereby causing skills gap. The aforestated fact has therefore, led the construction industry to hire workforce from other countries. And this has become the norm and an annual occurrence. Thus, lack of high-quality skills has jeopardized the productivity of the construction industry (Mackenzie *et al.,* 2000; CITB, 2015). Although the skills gap has been studied all over the world, such studies are relatively scarce and new in situation of some developing countries like Nigeria (Bilau, et al., 2015). The existence of skill gap in industry is as a result of un-skilled craft men who are not competent enough to discharge their duties accordingly this could be attributed to the fact that education and training are not delivering the general and technical skills required for employment (Chan & Dainty, 2007).

Manson *et al. (2009)* concluded that, based on employers' feedback from the construction industry, skills gap is prominent within the following skills,

personal skills, numeracy, literacy, IT skills, generic skills and vocational and job specific skills. The identified skills are needed for employment at the workplace. General education is comprised of some skills to include generic skills which is one of the courses that has been embedded into the curriculum of TVET both in the developed and developing countries in order to serve as bases for training. The in-ability of technical college students in Nigeria in area of sciences, technology, engineering and maths (STEM) has become a major challenge. The in-ability of students to comprehend and apply those subjects has created a skills gap among the workforce. The industry has complained about some skills identified to include cognitive and non-cognitive skills, numeracy, leadership, communication and host of other skills among the craft workers (Jayaram & Engmann, 2017, Lututala, 2012) in which the students does not perform well, which has resulted into skills gap.

Employers perceive that skills gap is when employees or the existing workers possess inadequate skills in meeting the business aspirations of the industry, this is termed internal skill gaps or where new employees come out to be qualified but absolutely, they are not qualified (El-Sabaa's, 2001). According to Strietska (2008), skills gaps can be likened to the qualitative inequality between the supply and demand of the labour market. Skills gaps are skills deficiencies of the workforce (El-Sabaa's, 2001). In other forms, skills gap could be the difference in skills required by the industry and the skill possessed by the employee. It could also be when skills levels are lower than those required to do their present job, this is assumed to be a manifestation of a skills gap (Sutherland & Lodge, 2008). It could be distinction within skills needed for a work and those skills acquired by eventual worker. It is an extent to which employers observe their workers' present skills as insufficient to meet present business goals (Hogarth et al., 2001).

There are two major types of skill gaps that are prominent, first, the internal skills gap which this study is based upon. It is a skills gap where few of the

workers in an organisation are not experts on their current post (Hogarth et al., 2001), while, thesecond is the latent skills gaps; this is a situation where the industry lacks professional ethics and it is reflected among the low level workers in which their competencies are queried (Hogarth et al., 2001).

Skills gap affects most of the developed countries like China, U.S.A, UK, Australia, Canada, Northern Ireland, Germany to mention a few. Germany complained about effects of skills gap as it has caused unemployment, low productivity. The above gaps created difficulty in filling millions available jobs as employers could not find qualified workers needed (Zwick, 2007; CEDEFOP, 2012). This gap equally restrains business growth worldwide. In similar vein, other countries like UK, Canada, and Sweden have complained about the effects of skills gap on the economy of their countries. The effects of skills gap were reported by Mina and Gaghadi (2005) adopting evidence from UK national employment survey (2003), he reported the effect of skills gap as having side effect on the industry, in postponing new production of the industry, likewise gaps created serve as a barrier to introducing new work practices.

However, previous work from Northern Ireland sectorial studies (Benneth and McGuinness, 2009), also reported the extent to which the performance of the firms is being constrained as a result of unfilled vacancies which has an adverse effect on the firms by reducing the output per worker level. Skills gap mostly occurs within the firm and occurs due to effect of skill shortages which originates before the recruitment of the workforce. The U.S. manufacturing company conducted a research on skills gap, the findings show that it was not only the deficiency on part of the skilled workers are responsible for the gap, other factors were equally responsible for the gap (Weaver and Osterman, 2013). In that vein, Hogarth & Wilson, (2001), conducted a survey research to reveal that occupation in connection with skills shortage records vacancies in area of artisans' and professionals, with twenty two percent of the total employee recording skills shortage in area of hybrid skills (a mixture of two or more skills). Hogarth et al (2001) similarly

revealed, that, many establishments reporting skills gap, spell out their challenges in terms of skills need for their establishment, most industry required the artisans to have amalgamation of two or more skills are required for work.

Interestingly, most construction industries, skills gaps were numerous and complicated depending on the area of which the case study was undertaking. Challenges in connection with skills have been labelled skill gaps, the study shows that the major causes of skills gap include, failure to budget for staff development, deficiency on part on the skilled workers to be conversant with new working practices and problems of employing and retaining of the workforce. Boyd and Wild (1999) attest to the education and training offered to the technical college graduates, which are not adequate for professionals in construction education. This profession requires a detailed curriculum for imparting knowledge and skills required for employment in the industry. Pitt (1995) queried the curriculum used in teaching the graduates of technical colleges whether it is relevant to the need of the industry in terms of skills need.

2.6: Skills Gap among Craft Workers in Nigeria

Nigeria is a country which is highly populated and has a very large area of land with lots of mineral resources, it has a high demand for structures, buildings and offices for its citizens, inhabitants and business activities, this require skilled labour workers to take care of its construction industry. The skilled workforce who acts as the heart of the industry is comprised of the artisans, technicians and the engineers.The usefulness of these set of skilled labour pool cannot be overestimated as the skilled labour personnel in the construction industry add more seriously to the social and economic development of Nigeria (Ogwo and Oranu, 2006; Megudu*et al.,* 2011; Odesola and Idoro, 2014; Elinwa and Uba, 2001).

The usefulness of artisans in the construction industry isnumerous; they contribute immensely to the continuity, development and survival of the construction industry and as well play prominent role in construction works

in Nigeria (Rafee, 2012; Megudu et al, 2011). As important aspect of education that could contribute to the economic development and social status in Nigeria are the products of Technical Vocational Education (TVE), TVE according to the Federal government of Nigeria is described as institution of learning that trains artisans, to improve the technical challenges faced by the construction industry. VTE has been known for hands-on-practice, which consist mainly tasks that must be carried out competently. VTE according to UNESCO (2012), is the whole educational course comprising general education in conjunction with technology and sciences aspects inculcating, practice, skills and attitudes for the social and economic development.

However, it is imperative to note that TVE is not about knowing things only but is an amalgamation of knowing and doing task competently. (Oketch, 2007). TVE is different from just teaching domain specific skills but a hybrid of courses to include "skills" and practice, which makes it distinct from other forms of educational training. TVE is mainly about imparting various skills needed for work into their students in other to gain employment.

The construction industry relied on skilled workforce particularly the craft men in carrying out the daily task that must be done. Technical vocational education is a branch of education offered presently to equip students who has the flair for technical and vocational courses so as to meet the manpower needs of the construction industry (Ogwo & Oranu, 2006).

In spite of high demand for skilled craft men, it has been observed that these set of construction workforce was unemployed, this was due to incompetence and lack of expertise and adequate appropriate skills needed for work (Zwick, 2007). The deficiency of the craft men in skills required for work in the construction industry has come to the notice of the construction experts. The effect of this, is that, the craft men failed to discharge their task and obligations to the industry and (Oni, 2007; Awe, 2010).

Similarly, Aibinu and Odeyinka (2006) stressed that, inadequate experience and absence of specialization on the part of technical college graduates have contributed to low level of productivity, which has a great effect on industry, thereby affecting productivity and business growth. Effects of skills deficiency are numerous parts of which are that industries will not be capable and efficient in meeting up with latest working principles and practices required of an industry and invariably debar their capability and effectiveness in producing professional goods (Cappelli, 2014).

Nevertheless, the effect of skills gap caused by skilled craftsmen affects productivity, work quality, overall organisational profit and project duration (Durdyev&Mbachu, 2011; Ruchi, 2012; Alinaitwe et al, 2007; Kuroshi& Lawal, 2014). This is in line with observation of Abdel-wahab*et al. (*2008), that lack of skills affects productivity. This could be traced back to the educational tools and equipment's available in technical colleges which are outdated while modern ones are flawed, and that training and curriculum guiding the programme of study of the craft men need to be queried due to the complaint of the construction industry (Awe, 2010; Ogwo & Oranu; 2006). The effect of skill deficiency on the skilled workforce is that majority of them have greater difficulty both in finding employment and staying being employed.

Interestingly, recent studies in construction industry highlight the skill challenges faced by the industry as a major barrier in achieving high level of productivity (Ofori, 1990). In similar vein Giles et al (2004) emphasise and argue that existing workforce skills, needs to be updated and improved upon to meet the current demand and expectation of the industry and clients because of technological changes. The lack of unqualified skilled craft workforce and lack of high-quality skill leads to skills gap

The level of technological advancement has increased in the area of tools and equipment used by the construction industry thereby calling for the industry workforce to update their skills to meet the current skills required globally (Crosthwaite, 2000). In more technical areas, equipment is

becoming ever more sophisticated thereby calling for training in the use of tools and equipment's. The technological advancement equally calls for upskilling and multiskilling in every area of construction technique (Crosthwaite, 2000; Ejohwomu et al, 2008). Nigeria lags behind in updating its curriculum to suit the industry need in terms of skill acquisition. Although skill acquisition programme is organized in order to increase the skill level and competency of the skilled workforce, it has never yielded a positive result (Olaitan *et al*., 2006 quoted in Oketch, 2007). Crosthwaite (2000), has stressed the benefits of investing in the construction skilled workforce by training them to adapt to changes and advancement in modern technology and construction know-how in order to close the existing skills gap.

Evidence from past researches has shown that skills gap exists in Nigeria among the skilled workforce. There has been various argument about the qualities of graduates produced in most technical training institutions in Nigeria. For instance (Olomolaiye and Ogunlana, 1989; Awe, 2010; Muya et al., 2006) observed that most graduates of technical institutions in Nigeria are not skilled enough for employment in industry and commerce. In this research, the skills gap working definition is adopted. As it is vividly shown in the study, review of literature has identified some causes, effects and evidence of skills gap existence among the Nigerian craft workers in construction industry. The industry identified skills gap as lack of the right skills among the trained workforce which are the craft workers from technical colleges to include the electrical installation graduates in Nigeria. Electrical installation graduates in Nigeria were not an exemption from issue of skills gap, analytical review on electrical technology education programme curriculum showed that the curriculum gave less attention to practice based courses that provide skills of the programme thereby causing skills gap among their graduates (Sarima & Dahiru, 2015). Researchers has identified skills gap as a global issue, which has become a significant matter that affects industries across the universe (Ofori, 2001). Research has shown that the existence of skills gap in industry is as a result of un-skilled craft men

who are not competent enough to discharge their duties accordingly (Chan & Dainty, 2007).

2.7 Measurement of Skills gap

Skills gap need to be measured in order to understand the scale of the gap and to suggest solution in rectifying the gaps in order not to have effects or cause problems for the industry. Different tools are available for measurement of skills gap within industry. These include employer opinion surveys, the labour supply/demand tool using qualification or educational level as proxy, and hybrid approaches which are the combination of employer's opinion survey and labour supply demand indicator and the shared classification system (Aring, 2012; Clark, 2013; Acceptance and Commitment Training, 2011). The main parts of the employer's survey consist of different forms of skills gap they came across in their proposed skilled workers, types and areas of weakness of the employees, employer's benchmark and ranking table for the employees, using employer surveys to assess skills gaps is employed across industry sectors like, construction, manufacturing, healthcare and energy (Aring, 2012; Clark, 2013; Acceptance and Commitment Training, 2011).

The features of labour supply/demand tool consist of using economic theory schematic diagram, plotting demand against supply, where data will be collected from Federal ministry of education to represent demand axis and National occupational employment to represent supply axis, the labour supply/demand tool is employed in construction and housing industry (Aring, 2012; Clark, 2013; Acceptance and Commitment Training, 2011). According to ACT (2012), there is the availability of data to implement employer's survey tool if it is requested for use in the whole world. The data for implementing the labour supply/demand tool are also readily available in UK as a developed country. In developed countries, databases exist in orderly and they are functional when compared to a developing country like Nigeria; where databases are non-functional or crashed. Electronic record

(e-record) keeping is new to sub Saharan Africa and there are issues of management of records in educational ministries, universities and nearly all parastatal. Majority of government ministries do not have records retention schedule and workers are not vast in electronic record keeping (Asogwa, 2012; Unegbu and Adenike, 2013)

Therefore, where the data will not be readily available will not be ideal for this study.The craft men are found to be deficient in some skills as previously highlighted in some findings to include academic, generic, technical, soft and employability skills. These areas will be explored to measure the gaps inherent in each of the skills. Having possessed a skill has some elements of interrelation with your educational attainment (Mawer& Jackson, 2005; Bellam&Hubler, 2014). New templates for policy and the need for performance in industry designed by Scottish government (Payne, 2010) may be used for the measurement, as this has been previously used in measuring of skills gap. The template may be adopted, modified and worked upon so as to allow room for improvement and will allow a comprehensive measurement of skills gap to emerge which will be communicated to the stakeholders. The new template adopted for measurement is similar to other tools used in the developed countries. However, measuring system differs from Canada to USA and to other developed countries. The measurement of skills gap among the craft men in respective workplaces like construction, mining, health sector and host of other industries is very necessary for the growth and productivity of the industry.

2.8 Tools for measuring skills gap

Three major tools have been identified for measuring skills gap, these include employer opinion survey, the labour supply/demand tool and the hybrid approach (Aring, 2012; Clark, 2013; ACT, 2011).

2.8.1 Employer opinion survey

This requires questionnaire to be given to employers to assess the level of competence of the craft men in areas of skills possession and areas of deficiency (Clark, 2013; ACT, 2011). The major skills identified will then be tested and the performance of each of the craft workers would be tested. This is achieved using the questionnaire and based on this, and other factors, appraisal of the students were conducted using a five-point Likert assessment scale. The employer survey tool is better than other set of tools identified for measuring skills gap, because most data and statistics will be newly generated, reliable and be readily available for use.

It is difficult to study skills gap from the perspective of using employer-based surveys. It becomes a problem in that the data collected are established on employer's perception of labour market skill sets. Other areas that are difficult are on thepart of skill deficiencies of the prospective skilled workers (ACT, 2011).

2.8.2 The labour supply/demand tool

Economic theory technique was adopted for the skills gap analysis. This was applied by computing skills gap, using the totality of supply and demand data. Basically, the study adopts the economic theory to know what is achieved educationally.The implementation of using changes in educational studies as a replacement for skills level is accepted. There are lots of issues about the software that handles the storage, retrieval and updating of data from the database most times (Asogwa, 2012; Unegbu and Adenike, 2013)As a result of these issues, the database tool became inappropriate for use in

this research coupled with the fact that,this study measure the gap in skills to inform training. Looking at the number of trained graduates does not help to identify these more subtle deficiencies. Therefore, it cannot be used to inform curriculum. That is, it addresses quantity rather than quality issues, which makes it unsuitable for this research.

2.8.3 Hybrid Approaches

This is the combination of employer opinion survey and the labour supply/demand tool, though is recognized as the best practice, but only applicable in developed countries. The advantage of this approach is that it provides a fair access that merge both aggregate and customized data to resolve gaps in skills identified for measuring (Aring, 2012). The problem of technical college graduates in this study is unemployment, for this investigation supply and demand statistics are not helpful in meeting part of the stated objectives for this study.

2.9 Research relating to Skills gap in Nigeria

Research about the existence of skills gap among the skilled labour pool in area of construction has become an issue of discussion in various developed countries together with developing countries, most especially the existence of skills gap within the craft men in the construction industry (Manson *et al*., 2002; Dainty *et al*., 2004; UNESCO, 2012). The issue could be attributed or traced back to education and training for not providing the necessary and adequate skills needed by the construction industry, which has become a universal challenge. UNESCO (2012) reported that there is skills gap throughout the world. The skills gap crisis in the construction industry is not peculiar to Nigeria. It was recorded by Hass *et al*. (2001) that the issue of labour shortage and skills gap has eating deep in to the construction industry, thereby affecting the USA vigorously.

In Nigeria, research on skills gap in relation to skilled workforce in construction industry is under explored. Employers realised that there are also areas of skill deficiencies within the skilled workforce graduates

(Odusami*et al*., 2003; Oloyede*et al*., 2010; Olusegun & Micheal, 2011). These deficiencies are at various levels, though more so in the craft workers. Incompetency and lack of skill by craft skilled workers in construction industry have been noticed and widely publicised by news and reports. (Obiegbu, 2002; Olaitan *et al*., 2006; Bilau et al, 2015).Previous research by Udofia (2012),Ogwo and Oranu (2006) reveal evidences of skills gap in Nigeria that include the following: industry comments; importation of expatriates; and unemployment of technical graduates. These are discussed in further detail below

2.9.1 Insufficient skill

Lack of adequate skills and expertise on part of skilled craft men has become a big challenge. The construction industry have been complaining about these set of craft workers in area of practical and technical skills. Majorly, the industry relied on hybrid of skills for employment in which they are found lacking (Odusami*et al*., 2003; Oloyede*et al*., 2010; Nicoleau & Sackman, 2017 Olusegun and Micheal, 2011). The inadequate training received from both the formal and informal traininghas contributed to the lack of skill.The school and obsolete equipment's has contributed greatly to skills gap (Oni, 2007).

2.9.2 Importation of expatriates

Lack of sufficient skills on the part of Nigerian craft labour pool has prompted the federal government of Nigeria to import expatriates from developed countries in the construction works (Nigerian Punch, 2006). Such activity suggests, that the local workforce is not competent enough to handle such big projects due to insufficient skills (Oni, 2007).

In the effort tp prevent lack of skills among the technical college graduates, the federal government of Nigeria has endeavour to supply tools and equipment's, introduced acquisition programmes and introduction of school

on wheel in order to prevent skills gap (FRN, 2007; Oni, 2007). However, in spite of this, educators and the construction industry experts agreed that, there is difference between skills provided by the school and skills need required by the industry thereby still creating a gap (Udofia, 2012; Ogwo and Oranu 2006). This skill gap therefore creates unemployment for technical college graduates.

2.9.3 Unemployment

Despite the large number of graduates of technical colleges (GTC) in Nigeria and the availability of the construction work, GTC remain unemployed as a result of their incompetence (Obiegbu, 2002; Olaitan *et al., 2000)*. Majority of skilled craft men and alumnus of technical colleges in Nigeria are found roaming about the street, mainly because the training acquired do not match the industry requirement. There are lots of dissimilarity between the vocational educational curriculum in skills development and those skills required by the construction industry which are meant for employability and development of the construction industry (Awe, 2007; Olaitan *et al., 2000)*. According to Olaitan et al. (2000) technical college graduates are found deficient in practical and technical skills, while Awe (2007), and Utopia (2012) reported that the graduates lack employability skills and also, they are deficient in technical skills.

2.10 FACTORS CAUSING SKILLS GAP

Previous research by Obiegbu (2002), Olaitan *et al. (2006)* and others affirm host of other components that combine together to cause construction skills gap part of which are: demand for multi-skill approach, demand for new skills, lack of educational training, rapid change in technology and inappropriate skills and inadequate training. It has been noted that the construction craftsmen have been criticised due to incompetency in their various disciplines and this has caused a bad impression on the kind of jobs produced and delivered. They are not regarded because of their low

performance and poor work attitude which has an adverse effect on the industry.

Researches have been conducted in this regard and noted the challenges therein (Yang & Chang, 2005; SLIM report, 2002; Chan & Kaka, 2003; Cotton et al., 2005; Alinaitwe et al., 2008; Nowak, 2005; Dainty et al., 2004; Odeh &Battaineh, 2002; Kawaguchi, 2003). These factors contributing to the skills gaps are further discussed below.

2.10.1 Demand for multi-skills approach

The Single skills approach is where workers master one specific craft trade. This is common in Nigeria and it is becoming increasingly inappropriate for the present-day industry (Arhani*et al*., 2003). It is also among the factors that causes skills gap. Conversely, multiskilling is the ability of a worker to carryout various jobs learnt in formal and non-formal setting which involves acquisition of skills knowledge and attitude used in various roles in the workplace. Multiskilling according to Collins dictionary is the act of training workers and entrants to engage in different roles and jobs.

Ejohwomu et al. (2006) highlighted that parts of the benefit of multiskilling is that it validates for a longer period of employment and gives maximum rate of income, it equally allows longevity of employment and also gives maximum income with reduced number of employees. Multiskilling have been discussed by different researchers to be very effective on issue of employment and job related issues in area of skilled workers and craftsmanship (Slomp & Molleman, 2003; Gomar et al., 2002; Piper &Liska; 2000; Thomas & Horman, 2002; Hass et al., 2001; Tam et al., 2001, Lill, 2009). Multiskilled workers have avariety of skills and these makes them to be competitive and they stay longer on project embarked upon (Lill, 2009; Ejohwomu et al. 2006). There are some disadvantages of multiskilling. These include meeting license requirements, resistance to change and lack of training (Dada & Ekpe, 2006).

Investigations in this area are still sparse in Nigeria (Obiegbu, 2002; Olaitan *et al., 1999*; Murray *et al*., 2002). However skilled workforce in any construction trade arguably needs to be competent in one or more profession so to allow them to have the ability to operate and familiar with operations, and equipment's in use in construction industry (Ness, 2009).

2.10.2 Demand for new skills

Currently there is a call for new skills demand in construction industry, this was due to technological development and the introduction of information technology in construction industry, which is required in operating tools and equipment's by the labour pool for work(Mackenzie et al., 2000; Cordery, 1989). Introduction of new technologies to the construction industry have redefined and called for new skills in other to improve performance and productivity (Wells &Walls, 2003; Agapiou et al., 1995). Introduction of new technology has greatly affected the performance of the craft men due to the out-of-date training they had previously acquired coupled with lack of various types of skills and showing lack of expertise as previously mentioned.

2.10.3 Lack of Educational Training

It is widely known and have been criticised, that, most craft men are not competent and lack adequate skills in their profession. This has been traced back to education and training curriculum which needs to be reviewed according to Oketch, (2007); Awe, (2010) and Olaitan *et al., (1999*) respectively. The lack of competence and adequate skills has contributed greatly to skills gap in Nigeria. The issue of education is a worldwide problem. Many researchers argued that even in developed countries, the issue of quality of education is dwindling and is a major concern for all. Therefore, it is considered by many studies as the main reason for the skills gap (Brown et al., 2002; World Bank, 2007; Livanos, 2009; Bennell & Al-Samarrai, 2007; Vaughn, 2005).

The main reason for the unstable education is that the curriculum guiding the programme of study has not been reviewed and developed to suit the industry need for sometimes (Namuddu et al., 2017). Inappropriate skills and inadequate training from non-experts to the craft trainees (Oketch, 2007; Olaitan et al., 1999) has contributed greatly to skills gap challenges in the construction industry. In that vein Awe (2010) and Steedman (1996) attributes the laxity, on the part of educational body guiding the program of study.

Looking at the vocational and technical education in Nigeria, it is vividly shown and specified in the curriculum that the number of hours assigned to teaching theory is much more compared to practice of skills which contributed to low impartation of skills in students (Awe, 2010; Olaitan et al., 2000). Invariably, the problem most times is not the curriculum, but the untrained instructors. Therefore, technical education board should make it mandatory to run a development programme for instructors so as enhance their knowledge in imparting the right attitude and skills into their students (Nicoleau & Sackman, 2017). It is better to equip the technical training institutions as there are no well-structured and equipped laboratories/workshops for training. The existing laboratories are out of date and even stocked with grossly inadequate tools and equipment for training (Awe, 2010).

To be engaged into the construction industry as a skilled worker, requires the entrant to be versatile and be ready to adapt to changes in technological innovation, this requires the labour pool especially the craft men to be highly skilled in their various profession, therefore technical training institutions in Nigeria should make it mandatory to instil skills that are relevant to industry need, there is need for the worker to be expert in his profession (Awe, 2010; Oketch, 2007; Mackenzie et al., 2000; Forde & Mackenzie, 2004).

2.10.4 Rapid technology advancement

Recently construction industry all over the world undergo technology advancement in every area of their work. There have been a lot of technological advancement in various places of work as a result of the effects of globalization and rapid revolution in information technology. The information technology compliance coupled with the advancement in technology has made it mandatory for everybody including the skilled workforce in the construction industry to adapt to changes. Regardless of the changes, yet industries and schools in the country are yet to comply with this trend and make it available for training. This, however, has a negative impact on performance and competency of the workforce (Ede, 2013; Femi, 2014). This calls for demand of new skills in the craft workforce.

2.10.5 Inappropriate skills and inadequate training

The lack of inadequate training and transfer of inappropriate skill has contributed to skills gap, coupled with textbooks that are out-of-date which the instructors use in transferring and imparting training to students (Udofia et al., 2012). In that vein, Awe et al (2010) stress that facilities for practical works in most technical colleges are obsolete and not functioning, coupled with non-availability of modern tools and equipment for vocational training. It has been noticed that the curriculum guiding the technical college disciplines is not delivering much needed employment skills due to non-competency on part of the instructors and curriculum developers (Nicoleau & Sackman, 21017).

2.10.6 Staff being new on the role

Inexperience and poor workmanship on the part of the craft worker, contributed to the issue of skills gap coupled with being new on the job role. The inability to effect changes, and to fully operate and utilise the new technology and the intricacies of the new job role creates skills gap more

than ever before (Awe, 2010; Oketch, 2007; Mackenzie et al., 2000; Forde & Mackenzie, 2004).

The shortage of craft skilled workforce in the construction industry to adapt to changes with the recent advancement in technology with the use of tools and equipment have been problematic for a long time. This require the education and training to collaborate with the construction industry to look into the challenges (Construction Skills, 2007; Egan, 1998; Whittock, 2002).

2.11 SUGGESTED STRATEGIES FOR COMBATING SKILLS GAP

2.11.1 Apprenticeship Training

In combating the skills gap that is evident, Germany has taken the step of introducing a dual modern apprenticeship model. To develop a world first class workforce and resolve the challenges that are prevailing, vocational technical education is the answer in Germany (OECD, 2011). Apprenticeship training programme have been organized and identified by the vocational and education training as a route of providing successful and highly skilled workers.The workforce is employed in various workplace of interest where the apprentice becomes an expert in a chosen profession. Development and training of the skilled labour pool is of paramount importance to German government (Zwick, 2007). Many companies in different countries to include Japan, Canada and USA have imitated the idea of running an apprenticeship training programme to build a skilled workforce who will become experts in their various chosen fields (Zwick, 2007). The companies in-charge of the apprenticeship training program collaborate with the education and training to develop a curriculum guiding their program of study in relevant areas, the training of the instructors and issuing of certificates are solely the responsibilities of education and training. It was noted that in many countries in Europe, over half of the students are enrolled in vocational technical education program (OECD, 2011).

Presently, dual-apprenticeship have been adopted by other countries like Switzerland, Denmark and Austria. In these countries' students spend an average of three days outside with the company they have intention to work with relative to the training acquired in the workplace. At BMW, Porsche, and Mercedes Benz for example, students learn the physics, engineering and maths required to design and build luxury cars (Zwick, 2007).

The results analysed from 17 countries (OECD, 2011) concluded that to most teenagers, vocational education is the most effective way to learn. They also found that this approach better facilitates the student's entryin to the labour market.

In that vein U.S. researcher Holzer and Lerman (2007) suggested, apprenticeships help close the skills gap. Apprenticeship is another form of system used, to transfer skills within the skilled labour pool and other working group, which is basically based on implicit knowledge. Despite the advantages of apprenticeship form of training, it has its limitations to include, lack of a formal curriculum to guide the apprenticeship training, there is no formal assessment as it operates in the formal training, skills learnt is through imitation and hands on practice in the replica of where the apprentice choose to work (Attwell, 1997; Rauner and Smith, 2010; Lerman, 2010; Lerman et al., 2009).

According to Holzer and Lerman (2007) the body that makes up the construction industry in some states attest to the fact that apprenticeship as a form of training has improve the quality and competence of trained skilled craft men. The apprenticeship scheme has been yielding positive result. They emphasized that college degrees and internship don't produce the same quality of worker as intensive on the job apprenticeship. An apprenticeship is a real job while internship involves a slight amount of work.

Germany serves as a role model in solving issue of skills gap, and they have proffered solution in closing the skills gap that exist among the workforce: -

to include making investment in the education and training of craft men, preparing them for employment by issuing them certificates after graduation. Advice was given to neighbouring schools and colleges to imbibe the idea of introducing apprenticeship training to young students who has developed flair for programme in craft construction as alternative to secondary and high schools training in general studies only. Several companies all over the globe adhered to the instruction and advice of running apprenticeship training scheme, knowing the benefits accrued there-in to train and build competent skilled workforce of the private sector/state/local government in developing new programmes which help modernize their employee's skill sets (Brockmann et al. 2008).

2.11.2 The use of Constructivist Model

The model of learning-by-doing is proposed by the constructivist and is commonly adopted in vocational and technical education. Clarification on constructivist learning theory/model will be seen on section 3.8.1 of this thesis. Some of the most skills intensive professions in developed countries use the same form of learning. It was observed and noted that students who receive some vocational training at the same time as they are taking academic courses tend to do better in those courses than students taking only academic courses (Billet, 1996; Kerka, 1997; Doolittle et al., 1999; Elkjaer, 2003; Kelly & Kellam, 2009).

2.11.3 Retaining the Aging Workforce

Dantong et al (2011) believes that the experience gathered on the job by the aging skilled workforce helps in combating the skills gap that exist, the organizational training and retaining of the aging workforce helps in combating the skills gap faced by the industry. The newly recruited craft men do not possess the adequate skill and training that will be useful for the construction industry, because of the poor workmanship possessed by the newly recruited craft men, this will hinder the progress of the industry in terms of GDP. The construction industry in sub-saharan Africa retain skilled

employees in work after retirement age, mainly to overcome labour shortages, because of skills possessed in which experience acquired is a replacement for evaluating proficiency (Haupt, 2001; Hailstone, 2002). Smallwood & Haupt (2005) cited that the older skilled workers were resourceful to the construction industry in that they possess experience and produce better quality of work than younger skilled workers. They don't really require training, though the ageing workforce may not possess the latest skills as new technologies emerge but due to the acquired experience on the job, they are more quickly responded to training than the younger workers they could benefit from skills training (Smallwood & Haupt, 2005).

2.11.4 Training and Retraining the Skilled Workforce

Training and retraining of the workforce will contribute to closing the skills gap, as training and retraining all refer to the process of imparting skills on the workforce (Bokini, 2005). The training could be inform of classroom training as recommended by (Solomon et al., 2012), trade group training by (Solomon et al., 2012), apprenticeship training recommended by (Zou et al., 2008) on the job training as recommended by (Awe, 2010) and coaching and mentoring by (Umar, 2005; Ugwuja, 2010; Odesola and Idoro, 2014), as they all contribute to combating the skills gap.

2.11.5 Introduction of Robots

Robots have been introduced into the construction industry to perform excellently well in place of humans, they can conform to different kinds of jobs ranging from installation, fixing and erecting pillars within and around the construction site (Warszawski, 1984; Jackson, 1990).The robots possess some economic potentials to include saving the number of employees recruited into the industry, the robots work especially under unsafe, laborious and demanding environment, and they produce superior kind of job. The application of robotics to construction to date have been very limited in scope (Warszawski, 1984; Jackson, 1990; Jayaraj& Divakar, 2018). Robots are used in every area of construction work to include Electrical installation for high voltage transmission lines, obstacle recognition for

power transmission line inspection among other installations both in Electrical domestic and industrial installations (De Souza et al., 2004; Fu et al., 2006; Katrasnik et al., 2008; Miller et al., 2017; Nayyerloo et al., 2009; Jiang & Mamisher, 2004; Wang et al., 2010).

Though robots are very effective in improving the quality of the work done, it equally increased profitability, increase efficiency and some other factors, despite this advantages, it has its limitations to include type of tasks the machine can carry out in terms of performance, the robot does not have every function built into it, so for robots to perform excellently well, the use of good trusted robot integrators must be applied (Warszawski, 1984; Jackson, 1990; Jayaraj& Divakar, 2018).

2.12 Summary of the Chapter

This chapter is a review of literature on skills gap. It is well noted that the construction industry requires a competent skilled workforce to run the industry, this set of skilled workforce are supposed to be competent in their area of expertise, but due to lack of skill, the construction industry has complained about their lack of skill, this led to the investigation into the skills demand of construction companies. Investigations shows that the graduates of technical colleges in Nigeria lack various skills in their area of expertise to include communication skills, literacy skills, numeracy and cognitive skills. The lack ofskills on the part of these set of graduate's leads to skills gap.

It shows clearly, from the literature review that skills gap exists in Nigeria and elsewhere some contributory factors are listed in the text, factors causing skills gap were discussed and strategies for combating the skills gap that is prevalent were discussed among which are: Apprenticeship training, use of constructivist model, retaining the aging workforce amongst others. The next chapter presents the socio-economic context and vocational education in Nigeria.

Chapter 3 : SOCIO-ECONOMIC CONTEXT AND VOCATIONAL EDUCATION IN NIGERIA

3.1 Introduction

The aim of this research is to create a measuring and mapping framework to address the construction skills gap through improved technical and vocational education with reference to the challenges inherent in the Nigerian electrical installation education programme. Therefore, this chapter will provide a detailed overview of the nature of education and educational system, in Nigeria. This chapter is divided into the following sections. Section one will discuss the geographic context of Nigeria and give a review of the education and training in Nigeria. Section two will discuss various types of learning theory and the theory guiding the study. Section three will discuss the curriculum mapping guiding the study.

3.2 Geographic context of Nigeria

Nigeria is a country, whichwas initially known and called the Federal Republic of Nigeria, it is a country that domicile in West Africa. The population of the inhabitants is approximatelyover 197.7 million (Trading Economics, 2018; United Nations, 2018). Nigeria is highly populated and even with the highest population in Africa.The capital of the country is Abuja in Nigeria. The country is divided into36 states with its Federal Capital Territory situated in Abuja, this is comprised of over 274 ethnic groups. The ethnic groups are Yoruba, Igbo, Kanuri, Tiv, Hausa, Fulani, Ibibio and Ijaw.The remaining ethnics groups are the minority, English being the lingua franca of Nigeria. Nigeria is divided into six geopolitical zones, having a total of 774 local government Areas (LGAs) (Gbenga-Ilori & Ibiyemi, 2010). The country occupies landed area of 923,768 square km and shares boundaries with the Niger in the NorthChad and Cameroon in the East, the Republic of Benin in the West, and boarders of Gulf of Guinea in the South (United Nations, 2018; Internet World Stats, 2018). Nigeria is one of the best ten exporters of oil and Africa’s largest producer of oil (Ploch, 2011). Nigeria is a country that is

specially known for oil production and export. The country derives part of his incomefrom exporting oil to some developed countries, Nigeria produced agricultural, petroleum and gas in large quantities and have lots of mineral resources (Obadan, 2002). Currently the country suffers from political instability (Onuorah, 2009; Mundt & Aborisade, 2004).

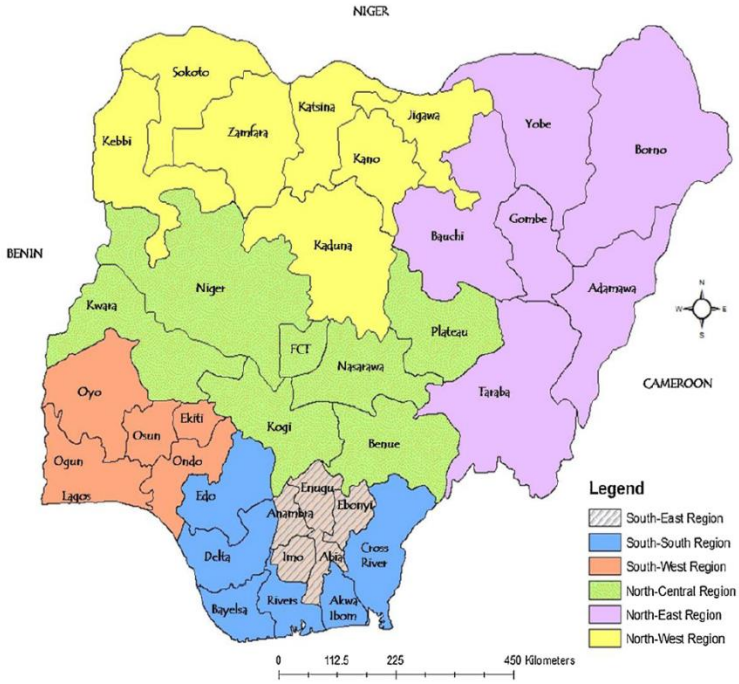

Figure 3-1: Map of Nigeria. Source: Ekong et al. (2012)

3.3 The Nigerian Construction Industry

Construction industry in Nigeria started gaining prominence since 1940s (Olowo-okere, 1985), with few companies in operation, not until between late 70s to 1983 which stands as the end of second republic, this was when the Nigerian construction industry witnessed an upsurge in construction contracting (Idoro, 2009).The operations of the Nigeria construction contractors are categorised into four major sectors the multinational, national, regional and local (Idoro, 2011). The multinational contractors cover all states of Nigeria and abroad, the national sector covers Nigeria, regional contractors are limited to one of the geo-political zonesfor local operation. Nigerian construction industry plays a major role in the economic growth of the Nation as they contributed to Nigerian GDP and it is a major

driver of infrastructural development. Construction industry helps to provide buildings, roads, bridges, dams, hospitals, schools, etc., which are vital for economic development, and for the comfort and prosperous living of a nation. The construction industry across the sphere is noted for discharging their responsibilities in areas of planning, designing, construction maintenance and repairs of all structures ranging from offices, domestic to industrial structures (Kheni*et al.,* 2008).

It makes it possible for public to thrive as it allows for people to have buildings and offices from which they work, while children attend to their school activities in a constructed building. The Nigerian construction industry is a major contributor of the economy's gross national product and fixed capital formation policies (Mogbo, 2000, Kadiri and Ayodele, 2013), and therefore plays a significant role in economic growth. Nigerian construction industry like any other industries faces several challenges including: poor implementation policies, poor finance scheme, bureaucracy, corruption and lack of technical knowhow amongst other factors (Isa *et al.,* 2013). Ofori (2001) also mentioned that inadequate technical knowhow, lack of managerial skills and acquisition of construction equipment is a major problem affecting the industry. Major challenges affecting the industry all needs to be addressed if a sustainable growth is to be attained (Oluwakiyesi, 2011).

The vital role played by the construction industry in terms of economy and national development is of great importance to the nation, national development encompasses basic infrastructure provided by the construction industry (Olufemi, 2007). The rate of investment of the construction industry is of great importance and it could be attributed to their participation in economic terms, it generates employment for about 25 percent of the labour force. The Nigerian construction industry contributed 40 percent of 30 billion earmarked during the Nigeria's third national development plan, which is a very great achievement (Olufemi, 2007).

However, on international comparison the Nigerian construction industry is seen as inefficient compared to developed countries like UK, Denmark, Sweden, and Switzerland (Oluwakiyesi, 2011).

3.4 Contribution of Construction Industry to Nigerian economy

The Nigerian construction industry plays a vital role in the economy of the nation. The major aim of this industry is to provide buildings, shelters, employment and infrastructure, this service contributes greatly to the country's economy by increasing the gross domestic product (GDP) (Anaman & Osei-Amponsah, 2007; Myers, 2013). A reasonable number of researchers has addressed and discussed the role and contribution of construction industry in the national economy. The construction industry and construction responsibilities are part of what is considered to be the economic growth of the nation. Nigerian construction industry provides employment for the labour force ranging from the human resources to engineering specialities (Khan, 2008). Nigerian construction industry serves as a contributory factor to the process of development (Field & Ofori, 1980) and growth in Nigeria. The importance of construction industry has to do with other parastatals of the Nigerian economy (Ofori, 1990).

Figure 3-2: Data Source: National Bureau of Statistics 2017 Map of Nigeria

Typical example of contribution of the construction industry to the national economy of the nation is shown in figure 3.2, thereby it is vividly shown that the Construction sector contributes in no small measure to the economy of Nigeria. In the third quarter the percentage increased to 16.69% in the third

quarter of 2017, an increase of 13.88% compared to the rate of 2.81% recorded in the same quarter of 2016. It was noticed however that there was a decrease of 0.88% compared to the prior quarter.

The main reason for this diagram is to show us that the construction contributed greatly to the economy of Nigeria in terms of its GdP (National Bureau of Statistics, 29017).

3.5 Review of Education and training in Nigeria

An investigation into educational system of Nigeria is important to this research study, because it has a prominent role and function to perform in the study, Nigeria is very enormous in size and most highly populated country in Africa, therefore, it is necessary to understand the steps that are being taken in running and accessing education to this large population. It is important to discuss and define what education is and its importance to the nation.

Education is a lifelong process, through which individual learn the culture of its people, surrounding and places (Okoro, 2011). Educational policies of each country differ in content and in methods throughout the whole world. According to Omolewa (2011) Nduka (1975) and Ocitti (1994)education is a procedure of artistic transference using civilisation to accept the individuals'art, music,literature, religion, organisation, science and high-tech as well as other ideas and values implied, that cuts across through and hold together its citizenry into a distinguishable mankind. Education has been defined as the procedure by which peoples' is reshaped and modify to his entire horizon of his lifestyle, the mankind is the matter of education; and the whole world is its end (Leathes, 2009). Education is the system acquired by a set of people of a society in imparting the acquired know-how, philosophy and skills from generation to generation (Olelewe and Amaka, 2011). Education, therefore, could be a system adopted by a nation in training its citizenry to read and write, instilling the right attitudes, technical know-how and skills for development and socializing.

The system of education in Nigeria is restricted to primary, secondary and tertiary institutions. The philosophy is aiming at the development of every person in the country to become literate and can fix and socialise within their community having access to all levels of learning (FGN, 2004) within the country.

The 6-3-3-4 system of education was introduced in Nigeria in 1983, the first six years is for formal enrolment into primary education, followed by the next three years in the junior secondary education, then the next three years is meant for the completion of the senior secondary education while that the last four years is for tertiary education (NPE, 2007; Okolocha, 2011). The main reason of introducing this system is to equip the citizens with relevant education and to equip the youths with employability skills that are relevant to industry need and at the same time make them to be self-reliant. Recently, a new system of education was introduced to replace the former 6-3-3-4 and it is named the Universal Basic Education (UBE) also known as the 9-3-4 system of education, the nine years is meant for the junior secondary education, the next three years is for the senior secondary school and the last four years is meant for the tertiary institution, a new curriculum was set for this new system of education basically to meet the Millennium Development Goals (MDGs) by 2020. Currently the National policy on education still rely on the application of the technical courses form of the 6-3-3-4 system of education in training the secondary and post-secondary schoolstudents (NPE, 2007).

3.6 Review of Educational systems in Nigeria

There have been lots of changes in the Nigerian educational systems over the years, basically for the purpose of restructuring, reorganisation and in terms of changing certificates awarded to graduates. Till date Nigeria has gone through three different styles of educational system, first between 70s-80s was the 6-5-4 system of education, where six years was spent in the elementary, five years in the secondary school and the last four years is for the tertiary institution, followed by 6-3-3-4which was introduced in 1983 as

previously discussed in section 3.5, the first six years was meant for the elementary, followed by the next three years in the junior secondary school, the next three years was meant for the senior secondary while the last four years was meant for learning at the tertiary institutions comprising of universities, polytechnics and colleges of education throughout the country. The policy on education stressed the acquisition of employability skills rather than focussing on issuing of certificates during the implementation of 6-3-3-4 system of education (Okolocha, 2011).

The education system of the country is established on National Policy on Education (NPE) document of 1977, which was updated in 1981, 1995 and 1998, 2004 and 2006. This policy document addresses inconsistences in the education provided in different parts of Nigeria. It emphasizes access to education and wide participation, quality of educational resources, and education for girls. The main or basic education is structured into 6-3-3-4, 6years to conclude the elementary class, 3years to complete the junior secondary school and three years to finish the seniorsecondary school. The latest amendment provides Nigeria with the last 4years to be spent in the tertiary education (University, polytechnic and colleges of education. The management and the responsibility of the learning institutions belongs to federal ministry of education whose main duties are to be responsible for maintaining the national policy, follow procedures and for making sure that the state policies are adhered to strictly within the set frameworks of national policy as stated for use. Educational responsibilities of various forms of learning are divided among the arms of the government ranging from the federal, state, and local governments(NPE, 2006).

Table 3-1: Education system in Nigeria (Federal Ministry of Education, Nigeria 2005)

Educational Classification	Type of Education	Federal Ministry of Education
Pre School	Early Childhood	
Primary (Elementary)	Basic Education	Federal Ministry of Education
Junior Secondary School	Secondary Education	Federal Ministry of Education
Senior Secondary School	Secondary Education	Federal Ministry of Education
Senior Technical School	Secondary Tech. School	Federal Ministry of Education
Higher/Tertiary Education	University/College	Federal Ministry of Education

The government of Nigeria embraced education and learning as a tool for promoting national growth and development. It is stated that education goals and objectives should be relevant to the need of the society at large, and their desire should be in relation to their environment and what exist in the real-world situation and, rapid social changes should be clearly set out to meet the current demand of the society (National policy on Education 2004). Therefore, the government of Nigeria concluded that 6-3-3-4 system of education will be the best form that will suit the present Nigeria, the history of this system of education backdated back to 1969 (Omovo, 2006). The major aim in creating the 6-3-3-4 education system in Nigeria is for the citizenry to exercise their potentials by using their heads, hands and heart, this was then taking up as a laudable project when it was initiated, it was then accepted as a tool for communal unity that will bring all the citizenry together under a unified system of education, therefore to be in the right direction, towards the technological development of Nigeria. This structure has its shortcomings as its implementation was not properly planned and has apoor take off (Omovo, 2006). The execution of the 6-3-3-4 system has lots of drawbacks and limitations which include failure to instill relevant values which the system of education embraced, the system of education failed because it could not meet up with the education standard expected (Omovo, 2006). Most of the graduates of senior secondary schools and technical colleges were un-employed after graduation due to failure to include the entrepreneurial development in the programme curriculum,

which left the students without saleable skillsto engage themselves profitably (Omovo, 2006; Adenipekun, 2009;Uwaifo & Udidin, 2009).

Before 1959 in Nigeria, the duration of time spent in all tiers of educational stages vary from primary through secondary and tertiary institutions in Nigeria and even varied from region to region, however, the secondary components in terms of content are the same (Sasnett & Sepmeyer, 1967), not until 1959, when the federal Government of Nigeria commissioned Ashby Commission to research in to the needs of the workers in the country for the next twenty years, this acts as the beginning of the history of education in Nigeria educational system. The federal Government of Nigeria embark on Universal Primary Education (UPE) in 1976, the major reason of launching this programme was to give free primary school education to all children between age six to twelve years of age, this scheme was introduced to link the educational gap within the country and diminish the rising upswing of illiteracy in the country (Fafunwa, 2018)

The National Policy on Education kept on changing severally, mainly because the policy failed to achieve its goals.

3.7 Education Systems in Nigeria

3.7. 6-5-4 System of Education

This system of education as explained in section 3.6 require the elementary school level to cover ages 6 to 11 years, this falls within the first six years in the primary school, the examination to proceed to secondary education was conducted, based on merit, the child proceeded from primary school to secondary school, where the child on passing the entrance examination completed a five year program from secondary education of his choice. All the core subjects are on offer at this period.The last four years is for the University education for those that were successful at the West African School Certificate Examination (WASCE).

This system of education wasadopted from the primitive masters, purposely because it does not support science and technology, self –development and entrepreneurship (Woolman, 2001; Uwaifo & Udidin, 2009).

3.7.2 6-3-3-4 System of Education

Education in Nigeria was based on 6-3-3-4 system in the 80s, it was recommended in place of the former 6-5-4 system. This 6-3-3-4 was majorly designed for the graduates of this scheme so that they can make use of their senses and hand to achieve their aim and purpose in life.The goals and objectives set for 6-5-4 system of education could not be achieved, because of the lapses and deficiencies found in the former 6-5-4 system, this brought about theintroduction of 6-3-3-4 system of education (Fafunwa, 2018; Aladejana, 2013; Anieto, 2011). The 6-3-3-4 system of education is broken down to six-year primary school course, followed by the first three years in the secondary school called the junior secondary school, where general and pre-vocational courses are offered while the last three years is called the senior secondary school where vocational and general subjects are offered, the last four years is for the University programme. According to the National policy on education, this system of education stresses much attention on English, science and mathematics. Home Economics, Arabic and Agricultural Science are offered as elective subjects. Even though this system was introduced newly, the quality of education in Nigeria failed to improve, even though after the federal government of Nigeria has spent much on facilities and equipment's. Contributory factors to the failure of the programme include lack of furnished libraries, instructional facilities, laboratories and host of some other factors has made the system not to achieve its objectives as stated by the laid down policy (Anieto, 2011). In that vein, researchers observed the dwindling and low performance of students from this type of scheme in comparison to what is achievedin the past education system (Aladejana, 2013; Ugochukwu, 2009; Duze, 2011).

3.7.3 9-3-4 System of Education

The failure to accomplish the stated objectives slated for the 6-3-3-4 system, gives room for the replacement with another education system called the 9-3-4 system of education. The objective of this system is similar to that former system called 6-3-3-4 form of education. The objectives are to inculcate the national and societal attitude, conduct and character in children and to advertise functional literacy and numeracy, (Woolman, 2001). Another name given to 9-3-4 system of education is Universal basic education (UBE), in this system, the first 9 years is the combination of the first six years of primary education, and the first three years in the secondary which is the junior secondary school to form the nine years. The next three years represent the senior secondary school and the last four years is for the tertiary institution. The 9-3-4 scheme emphasize the importance and usefulness of non-academic vocational quest by introducing pre-vocational courses at all levels of educational system. The curriculum guiding senior secondary school has undergone review and has been introduced to schools in 2009 (Adenipekun, 2009; Uwaifo & Uddin, 2009; Bolaji et al., 2015).

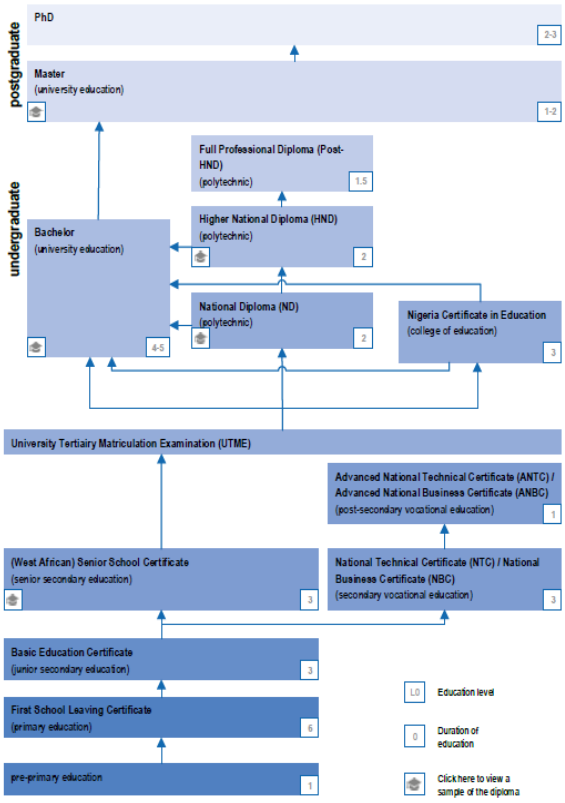

Figure 3-3: System of Education in Nigeria. Source: Nuffic

3.7.4 Primary Education

Currently, the Federal government of Nigeria introduced three tiers of educational levels in Nigeria, figure 3.3 gives a brief description of system of education in Nigeria from pre-primary education through postgraduate level in the University. The newly introduced system of education is called the 9-3-4 system of education.The first nine years consist of six years of primary education and the next three years is for junior secondary school inclusive, then the next three years is the senior secondary school, while the last four years is for tertiary institutions. The policy guiding the primary education is the National policy on education (NPE, 2006). The curriculum guiding the primary education entail the combination of both general subjects and the pre-vocational courses to includemathematics, Nigerian languages, English language, basic science and technology, religion, creative arts, Arabic language which is optional. Pre-vocational studies home economics, agriculture, and entrepreneurship and French language which is introduced in elementary 4. The policy emphasizes on the teaching methods to imbibe in teaching the students for the first three years in the school, wish must specifically be in mothers' tongue. The policy emphasizes on three major languages in Nigeria to be Yoruba, Hausa and Igbo. The system is structured to permit students to graduate after nine years of schooling where primary school leaving certificate is awarded after the completion of the program, or to continue careers through apprenticeship and vocational programs in either private or public Technical and Vocational Education Training institution, where craft training certificate will be awarded after 3years training (Uwaifo & Uwaifo 2009).

3.7.5 Junior Secondary Education

After the completion of the six years primary education in Nigeria, it is automatic to proceed to the junior secondary school, where the student will spend three years starting from the seventh grade through to the ninth grade, after which the Basic Education Certificate (BEC) will be awarded. The National policy recommended minimum ten subjects and maximum of thirteen subjectsfor final examination which takes place nationwide (NPE, 2006). The type of education on-offer at the level of junior secondary education has two major reasons, to prepare students with employability skills and competencies for gaining employment after graduation and to develop students along the academic and technical education career. Therefore, there are options of schooling to choose from be it senior secondary school, technical college, vocational training centres and apprenticeship training after graduation from junior secondary school.

3.7.6 Senior SecondarySchool Education

The senior secondary educational system in Nigeria is run for a period of three years. The three years in secondary school is spent between grades 10 through grade 12. Students were given the privilege to choose subjects of their choice, provided is in accordance with the rules set by the National Policy on Education. The new curriculum for senior secondary school stressed more on vocational training than previous curricula. This is with the intention of increasing employability of the senior secondary school leavers after graduation (NPE, 2006; Moja, 2000) so that they can be employed or self-employed. There are two forms of examinations for these set of students namely, the Senior School Certificate Examination (SSCE) and the General Certificate in Education (GCE) for final examination in secondary school. The senior secondary certificate examination is handled by two different bodies, West African Examination Council (WAEC) and National Examination Council (NECO). The certificates issued by these two bodies are

equivalent in assessment for gaining entrance into Universities, any one with five credits at a sitting is qualified to enter into any of the Nigerian University.

Those who did not complete their senior secondary education or failed out have option to retake or enrol for apprenticeship training or go back to any technical college to learn a trade or craft work, where he would sit for the professional City and Guilds of London Institute. Senior secondary school certificate (non-vocational) failed is part of prerequisite, for any student to go and learn a trade in technical institutions in Nigeria, though J.S.S 3 is the minimum entry requirement into any technical college of your choice (NPE, 2006). The last four years is for the tertiary institutions in colleges of education, colleges of technology and Universities. The entry qualification to universities and colleges of technology is five credits at one or two sittings in senior secondary school certificate (NPE, 2006).

3.7.7 Vocational and Technical Education

Technical and Vocational Education and Training (TVET) is ''used as a comprehensive term referring to those aspects 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 various sectors of economic and social life'' (UNESCO, 2012).

Various authors have defined vocational technical education from different viewpoint and context, in its approach, educators could hardly make a distinction between vocational and technical education. In clear terms, vocational education is a skilled program that train students for work in a specific trade or craft, while technical education produces students to become a professional, knowing the theory and principles guiding his profession (Oranu, 2006). Vocational education training programmes are on offer both at the private, public training institutions and government technical colleges in Nigeria. Nigerian Educational Research and Development (NERDC, 2008) defined VTE is a branch of education which

encompass general education, applied sciences, and the acquisition practical and theoretical knowledge, understanding, attitudes and skills in connection with occupations in various sections of economic, domestic and industrial settings. Technical colleges in Nigeria belong to the same grade with the senior secondary education in Nigeria. At the completion of junior secondary education, based on individual choice and certificate in hand, students proceed to senior secondary school or any technical college of your choice for three years. They pass out with City and Guilds of and the college certificate diploma (NPE, 2006).

Vocational and technical education (VTE) is regarded as been an essential part of national development planning, mainly because of its contributions in area of production and industrial growth. Notwithstanding of its input, the federal government and the society at large have not accorded an iota of recognition and respect for this type of education. These and some other factors of neglect coupled with lack of equipment and facilities have caused and contributed to the Nations underdevelopment (Ogwo & Oranu, 2006).

VTE has a significant part to exhibit in technological development of a nation. Education and training, acquisition of vocational, technical and most importantly employability skills and skills needed for employment by the workforce is essential for economic and national growth and development (Awe, 2007). VTE is one out of many educational programmes on offer in universities in Nigeria. The major purpose of vocational technical education as highlighted in the National policy on education is that it is ‘’education for work’’ It was created to instil skills acquisition in to students who have the flair for science and technology education so as to produce mass skilled manpower for employment and needs of the industry (NPE, 2007; Olaitan, 1996). Vocational technical education as defined by Okoro, (1993) as the provision of skills, knowledge and an attitude needed for effective job in specialised occupations. In similar vein, Olaitan (1996) defined vocational technical education as the crucial arrangement that will empower one to meet his/her growth needs and ambition which, for many, will establish an

immediate employment in the job market entry. Brennam and Little (1996) profess that, in as much as vocational education is an essential component of sustainable self-employment, rate of disseminating skills relevant to employment should be inspired by instructors', vocational educationist and other parastatal that provide training skills. The emphasis here is that the vocational educator should lay much emphasis in disseminating and teaching employability skills to students before graduating in their chosen vocation.

Technical colleges in Nigeria that produces the skilled craft men were created under the system of education called 6-3-3-4, they spend three years in training in the following programmes plumbing, general welding, Bricklaying & Concreting, carpentry, wood work, electrical installation, screen printing, furniture craft, screen printing, accounting, secretarial studies, computer studies and host of other programmes, some of these programmes were under Engineering trades, some under Construction trades, some programmes are under Miscellaneous trades and Business trades as alternative to senior secondary school education. The technical colleges in Nigeria offer college diploma or Federal craft certificate in various disciplines. The external body in charge of the external examination is the City and Guilds of London Institute(CGLI) they issue certificates in various craft work. In December 1972, West African Examination Council (WAEC) took over the conduct of examinations in some technical and commercial subjects from RSA and CGLI. The body taking charge during 1985 reform was retrieved of their position due to reorganisation and they were replaced by the National Business and Technical Examination Board (NABTEB) and was introduced in 1995.

The National Board for Technical Education (NBTE) is a prominent agency of Federal Ministry of Education specially established to take care all form of TVE, University Education not inclusive. This board is equally saddled with the responsibility of structuring and providing curriculum for VTE. The board is also in-charge of supervision and issuing of certificates for all programmes

run by all technical training institutions in federal republic of Nigeria. They are charged with the duties of technical training institutions to include technical colleges, polytechnics, colleges of technology and colleges of education technical in Nigeria (NPE, 2006).

The system of education in Nigeria proposed a number ofopportunities for vocational and technical education at both the secondary and post-secondary school levels.

There are three major technical training issues concerning craft levels, underTechnical and Vocational Education in Nigeria, they are issues of, Technical colleges, Vocational Enterprises Institutions and National Vocational Qualifications Framework.

Vocational education in Nigeria provides a number of opportunities for the secondary and post-secondary schools students in order to learn a trade and to reduce the un-employment that has long been affecting them drastically. The Federal government of Nigeria have been trying to upgrade vocational training by introducing ''Vocationalization'' of secondary education thereby instilling skills, most especially employability skills, such that students can be employed after secondary education and equally upgrade the National Vocational Qualifications Framework by NBTE, very much similar to other frameworks in other countries like UK, Germany and France (Moja, 2000). This type of education has been recognised as education that can contribute to social and economic development of a nation. The Ministry of science and technology has raised an awareness stressing the importance of science, technical and vocational education to the public (NPE, 2006)

Despite the best intentions of Nigerian government, VTE are still facing lots of challenges ranging from problems related to curricula, deficient monitoring and evaluation procedures and poor funding to mention a few (Awe, 2007).

3.7.8 Technical Colleges

Technical colleges are established in accordance with the stated rules and regulations of National Policy on Education, under the control of NABTEB and NBTE. This institution run a variety of programmes at the craft level to include Brickwork, Carpentry, Hotel and Catering management, Electrical installation, Television and Radio maintenance etc. are taught, in producing skilled workers meant for the industries and society at large. The goals of vocational and technical education as stipulated in National Policy on Education (2004) focused on:

''The provision of trained manpower in the applied sciences, technology and business particularly at craft, advanced craft and technical levels.

The availability of technical knowledge and vocational skills necessary for agricultural, commercial and economic development

Giving training and imparting the necessary skills to individual who shall be self-reliant economically''

Trainees completing technical college programmes shall have three options:

''Secure employment either at the end of the whole course or after completing one or more modules of employable skill.

Set up their own business and become self-employed and be thus able to employ others

Pursue further education in advanced craft/technical programme and in post-secondary technical institutions such as the colleges of education (technical) and of course, the universities'' (NPE, 2006)

The production of technical personnel at technical colleges does not meet the industrial need of industries (NPE, 2006). Technical education has been referred to as the education for the never do well students among the general populace (Ogwo & Oranu, 2006). Moreover, given the poor societal attitude, it is perceived as a form of education for the ungifted and the under-privilege. Although the employment rate of those who had only

general education had been dwindling, most students who gained admission into technical education programmes are without adequate/requisite technical qualification (Okorie, 2000). Entering the technical college in Nigeria, students must possess a minimum of junior secondary school certificate (JSC). The limited education attainment represented by the junior school certificate has an adverse effect on the performance of these set of students as they cannot comprehend what they were taught both in practice and theory (Okorie, 2000). Students that perform averagely in technical courses and perform excellently in mathematics and science, demonstrating remarkably efficient in the artisan training centres shall also be given due consideration for admission.

Nwachukwu (1998) also disclosed that, due to the poor level of entry qualification, the trainees, graduate with either little or no relevant skill or employability skills, required for employment, thus giving rise to technical education graduate unemployment and hence poor perception of the stakeholders about technical education. Nwachukwu (1998) also disclosed that institutions of learning should endeavour to improve the state of facilities to enhance the standard of graduates of technical schools produced.

Nwankwor (1983) investigating on the challenges of developing technical education in Nigeria and its significance for industrial development, identify, that the major challenge of developing technical education lies with the government, part of which are, provision of funds, personnel to anchor the programme, recognition of the programme among other thingsand that the public were not aware of the benefits of technical education to individual and nation at large. He concluded that the entry qualification into technical institutions is poor and hence they should review the curriculum and the entry qualification of the students.

Little or no acceptance is bestowed on technical education by the government, and the public is responsible for low enrolment in technical education institutions in the country today hence, the technical personnel

need of the industry and society at large cannot be met. Salami and OluAina (2001) both pointed out individually that there are not enough qualified resource personnel in technical institutions. Technical personnel are made up of skilled men including artisans, technicians, technologists, vocational teachers, engineers and other categories of skilled persons possessing vocational and technical knowledge to undertake efficient production and administrative functions for industries and the entire society.Salami and OluAina (2001) both pointed out that the technical teachers training programme (TTP) had been scrapped due to finance, this programme is meant for the training of the unqualified technical teachers as most of them are from colleges of technology and polytechnic without requisite qualification for teaching.

In achieving the stated goals for this aspect of education, the main attributes of the curricula exercise for technical colleges is designed in foundation and course modules of each programme of study. Generally, the educational programme guiding each discipline consistof five parts namely, workshop practice, theory and related courses, industrial training/production work, general education and entrepreneurial training which the instructors should adhered to strictly in educating the craft students in their various departments. The National Policy on Education states that the proportion of the teacher to student's ratio must be 1:20 should be maintained for excellent performance on part of students this should be adhered to and, for the students to be versatile in practice, individual cubicle should be allotted for practice (NPE, 2006).

The duration for craft training programme is three years as we have it in senior secondary school and one year for the advanced programmes. It was mandatory for each school to open a unit where on-the job training and experience will be acquired by trainees for the betterment of school and the public. After the trainees have completed technical college programme, the graduate could find a job after the completion of the employability skills. The graduates may start self -employment and open their own personal

workshop and enter the world of work or proceed to higher institution of learning.

3.8 Educational Theories of Learning

There are numerous models of educational theories of learning ranging from constructivism, cognitivism, behaviourism, connectivism to humanism learning theory. Three prominent theories will be discussed in this study. Learning theories form the basis for the techniques of learning and tutoring the courses or the subject matter in all disciplines (Pugsley, 2011). There are new innovations in learning, generally things kept changing, and learning has changed from behaviourism, cognitive and cognitivism to humanism and connectivism. Presently, learning takes place in most settings ranging from home to school and even the workplace, industry training school and host of other training ground (Davis and Hase, 2001; Manuti et al., 2015; Eraut, 2004; Vaughan, 2008).

The learning theory that might be more suitable underpinning educational research of this nature and, that supports this study is that of constructivism. In the constructivist paradigm, learners construct their own knowledge and meaning from the experienced gained from other sources (Steffe&Gale, 1995; Fosnot, 1996). The idea of practical learning is that education should apply to the real world, constructivist is keen to test things out in practice, they are practical and realistic, technical oriented in the manner of technical and vocational education, which is science and practice based (Elkjaer, 2003). Experiential learning is a component of constructivism which is another way of saying that education learnt, comes through experience. Experiential learning deals with practice and discovering knowledge through experience (Sharpe, 2004).

3.8.1 Constructivism the Learning theory guiding this study

The act of human beings generating intelligence and interpretation, from adiscussion between humans, their understanding and their opinions generated by them is known as constructivism theory. (Billet, 1996).

Learning theories that have dominated vocational technical education have been (behaviourism) which is the learning gained through the acquired stimulus response pairs, studying in other to transform messages received,and training as a system of developing know-how (constructivism) (Rockmore, 2005; Fosnot, 2005, Mayer, 1992), not until recently, connectivism and humanism learning theories are gaining dominance (Eraut, 2004; Siemens, 2005), nevertheless, constructivism learning theory is adopted for this study.

Constructivism is a theory describing how learning takes place, the training, education, ability, skill and the experience of the trainee should be put into consideration as it plays a prominent part and it contributes to the learning techniques, this background contributes to shaping the knowledge the learner creates, as well as the truth the learner discover and attain, during the learning process as it progresses (Von Glasersfeld, 1989; Wertsch, 1997). In this paradigm, the student should be seriously engaged in the studying process of learning, it is not for the students to be passive when it is the duty of the teacher to disseminate the lecture. It is mandatory for teachers in social constructivism to conform to the task and responsibilities of facilitators in disseminating instruction to the learners (Bauersfeld, 1995). The difference is that the teacher gives a lecture that covers the theme of discussion, while the coordinator assists the trainee to discover how much he assimilates and grasp the subject matter. The focus of discussion on the subject matter shifted from the teacher and even the theme, and is shifted towards the trainee (Brownstein, 2001; Gamoran, Secada and Marrett, 1998). Therefore, the role of a teacher is distinct and differs from that of a learning facilitator. The facilitator supports the learner while the instructor provides solution according to the syllabus set. A coordinator prepares a guideline and provide clues for the trainee in other to resolve the problem. The educator mostly takes the responsibility, gives a lecture and a facilitator is in continuouslecturing with the learner (Rhodes and Bellary, 1999).

Learning to the social constructivist is a social process (Floden, 1994; McMahon, 1997). This means that learning does not only take place in our minds, but, that training takes place when individuals are involved in sociable engagements. To the social constructivist training equally transpires between the instructors and the learners (Holt and Willard-Holt, 2000). In other for the trainee to deduce meaning to the task in hand, it requires the personal and fair opinion, culture, skill and experience of the instructor. Learners make a comparison of their own findings compared to the teacher and their co-mates in getting another interpretation of the truth, trying to make an inference orbefore arriving at a conclusion (Kukla, 2000).

Model constructed by social constructivist relay the usefulness of affair between trainee and the teacher in the process of learning. In most constructivist model, collaboration is allowed between trainees, directly contradicted to conventional competitive way, so that they can both share the truth in their findings (Duffy and Jonassen, 1992). The act of mentoring is good for the learners (Archee and Duin 1995; Brown et al., 1989).

Constructivist model has been found useful in craft apprenticeship, this is where learning brings the learners into real life of performing usual procedure through exercise and sociable discussion similar to that evident, and that is rewarding (Ackerman, 1996). In the constructivist teaching method, training is best practiced by applying hands-on-approach, students master by practice, conduct experiments and awaits the completion, based on their outcome (Guthrie et al. 2004). This is in consonance with the ethics and principles of vocational technical education training stipulated by the City and Guilds of London (Ogwo and Oranu, 2006).

Guthrie et al. (2004) in their comparison of three instructional methods found hands-on-approach as the best method of giving instruction to the craft workers in technical education.

Different educators have asked questions concerning the efficiency of constructivist system of approach towards instructional design and its

application to instructionfor those who know nothing about the theme been discussed (Kirschner, Sweller, and Clark, 2006; Mayer, 2004). Looking from the constructivist perspective they argue that learning by doing is the best way to enhance learning, other critics argued that there is little or no evidence to back up the constructivist statement (Kirschner, Sweller and Clark 2006; Mayer, 2004). Mayer in its own finding proposed that pupils should participate actively in the process of studying and that the teachers should support accordingly applying guiding principle. In the constructivist classroom, questions were given to learners to resolve, learners therefore were divided into groups, to find solution to the problem and present their finding to a group of people (Carbonell, 2004). Other forms of learning that adopts the constructivist model are cooperative learning, hands on activities, discovery learning, and differentiated instruction are elements that characterise constructivist model of teaching (White-Clark, 2008). The act of learning by doing is well supported by the constructivist learning theory and it has been common practice in vocations and professions for centuries. Pragmatism is interdisciplinary in nature and has the advantages of constructing, emphasizing cognitive process, therefore, agreed with constructivist belief about how students learn best, which is hands on, learning–by-doing (Johnson et al., 2008)

3.8.2 Behaviourism

This learning theory is majorly covering the observable and measurable characteristics of human performance. The stimulus response association is responsible for the outward behaviour which the learner displays. This calls for investigations, as behaviourist learning theory is concerned about the behaviour of the learner (Bush, 2006). Therefore, their focus is based on learning as affected by changes in behaviour. Behaviour mostly is directed by stimuli.

Selection of one's response depends on initial behaviour and primary drives that existinstantly at the behaviour of a human being (Parkay and Hass, 2000). Behaviourist asserts that the only behaviour that is essential for study

is the one that can be observed directly, because it is actions that are measured not thoughts nor emotions. Behaviourism operates on the principle of stimulus response, this is glaring due to interaction between stimulus and response, rather behaviourist agreed that all behaviour is learned way of doing things.

From educational perspective, behaviourism is adopted by applying the system of rewards and punishments in the course of learning. Students who are well behaved are rewarded by the educators while those who are not complying with the rules and regulations were punished. The effects of reward in education is of very paramount importance to the learners. The originators of behaviourists approach to learning, Watson and Skinner view learning from the principles of Ivan Pavlov, who posited that the gastro intestinal system and the reaction with saliva and abdomen operation is based upon the reflexive in the involuntary system. To establish that, and to see ifexternal stimulant is effective during the exercise, each time he is given food to the dog he used for the experiment, he rang a bell when he gave food to the experiment dogs. He observed that the dog salivates directly before they were given food, he noticed that even as the bell was rung, the sound of the bell alone initiates the salivation of the dog, this is referred to as control stimulant (Rescorla, 1988). This gives an idea of stages of classical conditioning. Solitarily, food is equals to salivation, stimulant plus food will bring salivation which is conditioned stimulus and bell alone produces salivation which is equal to conditioned response (Rescorla, 1988).

Behaviourist techniques is equally applied in education to promote behaviour. It is used to promote reward and it acts like a positive reinforcement due to the behaviour of the student. It equally acts as a negative reinforcement, here it applies punishment on never do well students whose attitudes and behaviour are very bad (Peel, 2005)

3.8.3 Connectivism or Distributed Learning

Connectivism or distributed learning is a very recent theory of learning, it is established because human being communicates and manage information

by making interconnections, though, it has been gaining prominence among the ICT form of education. This theory of learning is for the computer age. This new theory suggests that people proceed to seek for understanding after formal schooling and continue to gain expertise from other avenues like networking, using new tools in technology (Siemens, 2005).

Connectivism is defined as ''the integration of principles explored by chaos, network, and complexity and self-organisation theories'' (Siemens, 2005). Distributed learning makes provision for acquiring skills and tasks needed for students to prosper in a computer age.

The distributed learning emphasize that learning is a process of bridginginformationand that of other sources together to have the knowledge and even more understanding than expected. Expertise is gained through various ways, not like in former linear way because of complexity, skill, news and, learning now inhibit in diverseopinions and in non-living being appliance. The root of studying through distributed learning theory of learning, is the connections between different etymology of knowledge and specifying what is relevant to program of study (Siemens, 2005; Steffens, 2015).

3.9 Implications of Learning Theories to Vocational TechnicalEducation

''Learning is an enduring change in behaviour, or the capacity to behave in a given fashion which results from practice or other forms of experience'' (Chunk, 2012).

Learning could be defined as changes in behaviour that result from experiencegained through education, skills, knowledge, formal and non-formal training (Atherton, 2011).

Theories of learning are mainly concerned about education and applicability of these theories to programme of study. Learning theories are theories whose main concern is to link research with education, theories according to (Chunk, 2012) explains how learning and teaching takes place in a school or class setting. Different theories have been discussed in this thesis, to

include constructivism, behaviourism, and connectivism. Theories differ in many ways, and their applicability and prediction to learning varies in how learning take place, in procedure for learning and in what aspects of learning they emphasize.

Education learning theories deals with the most important learning aspects that is related and of importance to education, these include the basic learning, role of development, the applied learning, content, instruction and motivation (Atherton, 2011).

3.10 Constructivist Learning Perspective

Some researchers affirm and agree that constructivist has frame the aspects of educational reasoning and organization in other to bring adequate and long lasting solution to the challenges of education (Chadd and Anderson, 2005; Brown, 1998; Doolittle and Camp, 1999; Brooks and Brooks, 1993), this also has a positive effect on Vocational technical education, which initially was based on behaviourism learning theory, but now on Constructivist learning.

Constructivism is a theory of learning that has been supported by many researchers, especially the cognitive investigators, who confirmed how teaching and learning has made it possible to transfer knowledge acquired to the company or the place of work, this contribution made by the cognitive investigators has made constructivist learning theory to gain supremacy than any other theory of learning(Lynch 1997). The constructivist theory relies on the notion that ‘’knowledge is not passively received but actively built up by the cognizing subject and that the function of cognition is adaptive and serves as theorganization of the experiential world’’ (Hawkins 1994). Wherefore, learning entail establishing your understanding or mastery of experiences and skill gained, constructivist learning therefore is part of personal aspiration where individual display his or her mastery of knowledge in the real-world situation or where it is required for work. Relevance of constructive knowledge featured in two major ways, first knowledge is actively constructed by the student through dealing with the

co-workers in the workplace by exchanging views concerning your work both verbally and through electronic mail and equipment's, machine and tools used for work in his environment or any other place which is applicable (Stevenson 1994).

The main intention of the constructivist investigator is that the knowledge acquired by human being is engineered, based on this the student form recently acquired knowledge on the premise of former learning, (Matthew, 1994; Hoover, 1996).

Second, philosophy of constructivism concerning learning as lively rather than complaisant since the learner understands a specific task or skill by what they come in contact with in the new learning environment.

Along the same line, Hoover (2008) consider that during the process of obtaining the superficial knowledge and the creation of specific knowledge the students remain dynamic, applying understanding, taking cognisance of their latest learning experiences, judging the regularity of former and recent knowledge, based on that judgement, they can reform their knowledge as at when necessary or due (Hoover, 1996). Learners should participate in projects or occupations at their workplace as it enhances their growth of knowledge. Therefore, Chadd and Anderson (2005) affirm that the instructor becomes a facilitatorand make preparation for the learning environment suitable for group exercise and participation in any group discussion or classroom situation. Becoming proficient and competent in your area of discipline require the learner to be involved in active participatory learning, offering answers to questions either wrong or right (Chadd& Anderson, 2005).

Kerka (1998) carried out an analysis with respect to constructivist approach to learning, she structured out some distinct parts of knowledge construction that she refers to as 'functional text', 'social context', and 'usefulness'. These seems to function very well effectively when fixed in the school context in which the recent knowledge and skills are applied, these

processes fortify and influence the students. Teachers facilitate learning by encouraging active enquiry, using a constructivist approach instructing students to query their speculation and instructing them in the construction exercise (Kerka, 1998).

From this point of view the constructivist perspective is in contrast with the behaviourism approach which presently dominate education and believes in the theory of motivation, here the teacher disseminates the selected knowledge, measures learner's aggressive behaviour, concentrate and direct on the procedure adopted by the worker on how the job is to be completed, this type of teaching and learning was done through memorization and recitation which, It is contrary to the constructivist method (Kerka, 1998).

There are lots of complaints and controversies about the traditional teacher-centred method, which the majority feel biased about because of the rote learning, memorization and recitation style of teaching and learning imbibed by the students, compared to the constructivist model which allows every student to be skilful and proficient in their work. The side effect of the traditional method is that very few students will be able to cope and pass out in their educational endeavour and in their various undertaken, most especially education (Kennedy & Haines, 2008).

3.11 Constructivism Application in Vocational Education

Lynch (1997), discussed the important contribution of vocational education in making the construction of knowledge easier through observational technique, set of circumstances, and communalmeans, it is meant for solving issues at the workplace all over the globe. Research has confirmed that the constructivist approach plays a prominent role on students active construction of knowledge because the learner is seen as the centre of attention, vocational education therefore, from the perspective of the student should be seen as a learning process rather than teaching process, moreover constructivism is a learning theory and not for teaching process

(Lynch, 1997). In using the constructivist learning theory, cognitive apprenticeship model must be applied, therefore the instructor organizes experiences and render counselling, and slowly reduces, as the students become more skilled in his field.

There are various forms of constructivism learning theory namely, constructivism, constructivist continuum, cognitive constructivism and the radical constructivism though they are all learning theories, but three of them are not containing the four epistemological tenets that is required of education methods. According to Von Glasersfeld (1984, 1998) proffered three crucial axiology principles of constructivism, the fourth was included recently during his course of writings, and they are:

1. Knowledge is not sluggishly gathered, but preferably, is the outcome of persistence hard work and being skilful;
2. Ability of an individual to learn under controlled situation improves the capability of working successfully in the workplace;
3. Learning, assembling and structuring individual learning experiences, which is not a representation of truth or actuality; and
4. Knowledge has its source from biological/neurological construction, and in communal, social behaviour of society, and language-baseddiscussion point of view (Dewey, 1980; Larochelle, Bednarz, &Garrison, 1998; Garrison, 1997; Gergen, 1995; Maturana & Varela, 1992)''.

Brown (1998), identified that technical vocational educationis laid on the principles of constructivism. Constructivism could be connected in variety of ways to include the growth of learning territory that brings togetherstudent centred ways of teachings, project-based learning, provisional teaching and learning skill, Unified collegiate and vocational syllabus and reliable appraisal. Here some of the fundamental components of constructivist theory can be included into these operations and suggest plans for their request in teaching and learning process.

3.11.1 Student-Centred Ways of Teaching

It has been established that in the regular school system having study hall, the target is on tutoring, although the case is different in the constructivist-based classroom, here the focus is basedon learning. The constructivist model is about the student and special ways of training. In the student lecture room, the learners work in partnership with others, together with the instructor, both the instructor and individual learner sharing the responsibility for learning, here team work comes into operation, because here everybody works together.The instructor should think of other individuals, experience, learning styles, learning needs and the individual student before taking decision on learning strategies (McWhorter et al. 1996) so that attention will be given to them individually to identify area of weaknesses of the individual learner. The major aim of learned centred teaching is to empower the learner. They feel better than their counterparts in the traditional classroom in that they are competent and more skilful, they learn through a vast array of experiences, they also have ability in generating knowledge through their own efforts and recapitulate what is learnt during the process (Maaka and Lipka, 1997).

In thestudent-centred way of teaching, the instructor serves the duty of a coordinator, who helps learners in their understanding and competency development by giving a demonstration of how scaffolding is erected and how to improve their skill performance.

The role of the instructor was summarised by (Kerka, 1997) as follows: the vocational instructors' duty is not to set jobs, but to arrange training that allow students to establish their own understanding and comprehension of the subject matter. Using the learning- by- doing method, the instructor is a mentor who provides supervision that slowly reduces as students become more skilled on his job, and who produces replica of models, reconcile differences, scaffolds, and rectify faults. The

school environments should replicate the major form of craft or profession practised in your locality or the workplace.

3.11.2 Problem-Based Learning (PBL)

Savery & Duffy (1995) identified Problem-based-learning as one of the most recent models of constructivist learning environment. Problem-based-learning has been widely embraced in various programmes of study, and educational fields to develop fault finding and problem solving in real learning situations. Barrows & Tamblyn (1980) defined Problem-based-learning as the outcome of training that resulted from studying how to resolve the comprehension of learning difficulty. In similar vein Stanford University Newsletter on teaching defined Problem-based-learning from an educational perspective as where learners study, by resolving demanding issues and unlimited problems. In PBL students depend on basis of their current knowledge, identify information necessary in solving the issues and approach used to solve the demanding issues. Therefore, PBL could be defined as a process where learners learn by self-intuition, based on past knowledge and experiences acquired to resolve demanding problems. The traditional approach to learning, follows collinearity procedure where the instructor gives order on what aspect of the task to be done. In PBL problem is first presented to the students, the students work in groups to find solution to the problem.

3.11. 3 Functions of the teacher in Problem-Based Learning

It is the responsibility of the instructor to identify a problem, or trouble shoot a system such that the problem becomes composite and imprecise yet extremely interesting to exhilarate the learner and relevant to the subject matter, however, the problem should not be familiar to the students but relevant to future use in work places and environments. There are three major roles performed by the Instructor in PBL, they are as follows;

First, the instructor should identify a problem that is appropriate and relevant to the content being taught, but in which students will not be able

to find solution to the problem. The induced fault introduced by the instructor will enlighten the learners with advanced or recent skills used in solving similar or more advanced problem at other times as required of them in practice (Doppelt, 2003).

Second, the instructor should arrange the learners in to groups that represents different skills level, this will help the learners to know their strengths and weaknesses such that they will work harder to achieve during the problem-solving process (Doppelt, 2003).

Third, the instructor is in charge to supply educational aid to help the learners in construction of the theme and stages in resolving the faults. The function of an instructor is similar to that of a teacher, coach and mentor to show the learners from known to unknown (Doppelt, 2003).

3.11.4 Students' Role in Problem-Based Learning

Functions performed by student's during the course of introducing the problem-based-learning are numerous to mention few, the learners will merge ingroups, to solve and treat the faults induced into the system, during this process the students will identify where the faults lie with the little experience and expertise acquired during the training in solving the problem at hand (Pierce & Jones, 1998; Savin-Baden, 2004; Gardner, 2006; Doppelt, 2003).

Landsberger (2011) identified some procedure students adopt to resolve the fault-findingsituation as follows:

1 Making enquiries into the matter relevant to the fault. Identify related literatures read comprehend and digest.

2 Itemize your findings about the problem identified. Review your groups' skills experience and mastery of the theme that associate with the problem.Spot the strengths and deficiencies of each member in the team so that you can deliberate and make good use of insightful contribution of each team member in resolving the problem.

3. Establish your statement of the problem and discuss within the team.

4. Make a list of all likely solutions to the problem

5. Prepare activities to be carried out within a time frame

6. Note the requirements in terms of tools and equipment to use in solving the problem.

7. Write your team findings and the discussions of your findings

8. Presentation and defending your findings and conclusions

3.12 Learning Methods in Vocational Education

Looking at learning methods from the constructivist perspective, there are various methods learners can adopt in learning a trade or craft, more importantly in vocational technical education, the teacher may combine the specialist illustration of a competence which learners emulate as the lecture goes on with other verifiable methods, which allows practice and experimental method of learning (Hetland et al, 2007). There are various methods outlined for learning in vocational education by the City and Guilds of London, which are in line with the constructivism approaches to learning to include, learning by watching (Rogoff, 2007; Hetland*et al,* 2007), learning by imitating (Jones, 2005; Sanditov, 2006), learning by practising (Claxton *et al,* 2010), learning through conversation (Baker, Jensen & Kolb, 2005; Billet, 2000), learning by coaching Lave & Wenger, 1991), learning by natural-world (Savery and Duffy, 1995), and host of other learning methods.

3.13 Philosophical Position of TVET

Conceptual framework could not be treated, without explaining the philosophical position guiding the programme. The philosophical position of TVET has remained the same from the inception, though the workforce educators argued and does not rely and believe in philosophical foundations guiding the programme (Miller, 1985; Lerwick, 1979). Based on this (Miller and Gregson, 1999) argued that to ignore philosophy of VTE is contrasting to the ethics guiding the programme, underrating the minute input of the

analytical skill, that can be contributed to vocational and technical education, this can cause debarment in developing a structure for planning, application and assessment of the programme. Some schools of thought believe that philosophy is synonymous with conceptual framework, which means that they are the same (Miller, 1996). There are three prominent philosophies guiding TVET, these are pragmatism, essentialism and pragmatism with a constructivist string, each of these philosophies can be applied independently.

The justification of essentialist's philosophy for technical and vocational education and training (TVET) is to meet up with needs of the labour market, its characteristics is based on successional systematized program of study, instructors are supposed to have acquired wealth of experience in business related studies different from the college syllabus (Kurtus, 2001; Kneller 1971). From the pragmatist point of view, the major reason of technical vocational and technical education and training(TVET) is to fulfil human being needs for self-actualisation and personal use, its characteristics is based on analytical and higher order thinking skills, learning is based on apprehension of the learners (Miller, 1985), and finally the pragmatist with a constructivist strand argued that the reason for technical and vocational education and training (TVET) is to change labour into a parliamentary form of government where the organization facilitates the learning of the workforce, the company controlling discrimination, injustice, ageism before dangerous situation arises in the workplace. (Miller & Gregson, 1999).

Literature has revealed that vocational technical education was based on multi-faceted philosophies ranging from behaviourist, constructivism, and realist to pragmatism (Kennedy, 2012). No single philosophy is found to be adequate to describe vocational training across jurisdictions and across periods (Hill, 1994). Vocational education and training do not have a unique characteristic, but it is based on combination of characteristics (Legal Information Institute, 2002). This study will be based from constructivist point of view because of its nature. Technical education emphasizes learning

by doing, exemplifies the project method as it develops self-activity, cultivates in the learners the freedom to choose between right and wrong (Dagoon, 2003) and trains the youth in scientific technology for a wider contribution to community development, which is the basic principles to be taught in technical colleges.

3.14 Theoretical and Conceptual Framework

Although, in the time past the theory of learning guiding educational program and method and practice of teaching of technical and vocational education and training (TVET) was behaviourism (Dobbins 1999; Wirth, 1972) education is a lifelong process, things kept changing , the 21st century skills required a more explicit and functional theory to guide the programme, UNESCO explains that TVET is mainly interested in obtaining education and technical-know-how in vocational and technical programs in other to be gainfully employed,TVET have been accorded with different names in different countries to include: Apprenticeship Training, Vocational Education, Technical Vocational Education (TVE), Occupational Education (OE), Vocational Education and Training (VET), Professional and Vocational Education (PVE), Career and Technical Education (CTE), Workforce Education (WE), Workplace Education (WE), Construction Education (CE) Technology Education (TE) all the aforementioned terms meant the same under TVET (Hollander et al., 2009) and they could be used interchangeably in this study as they are initially guided by behaviourism learning theory.

Researchers have explained and defined theories in various forms. The theories are representation of the rules guiding the belief about the nature of a nation, commodities and phenomena, in as much they hold presupposition about the extent to which people and phenomena can be restructured through experiences acquired, and the limitation that restricts human aspirations (Ezeji, 2001). Olaitan et al (2002) defined theory as a ''postulation requiring further explanation in order to make meaning''. Okorie (2000) stated that theory is obtained from Greek expression – Theories means looking at contemplation and speculation. Osuala (2001)

believed that theory is making every effort to synthesize and integrate experiential data for explanation and fusion. Therefore,theory will be defined as a set of ideas on which the practice of a concept is based upon, for learning and clarification purposes.

Therefore, the theoretical and conceptual framework for this study were based on constructivism learning theory and adopted Rojewski idea of conceptual structure for vocational technical education which is mainly focused on how students actively construct their own knowledge out of experiences (Rockmore, 2005; Fosnot, 2005). Even though, the theoretical framework that still guide TVET is mainly established on the work of David Snedden and Charles Prosser (Doty & Weissman, 1984; Camp &Hillison, 1983). Figure 3.4 clearly explain how learners establish their own understanding, which is the combination of the learners existing knowledge to new knowledge acquired from the instructors, forming the accomplished knowledge, which is the embodiment of skills required for employment in industry.

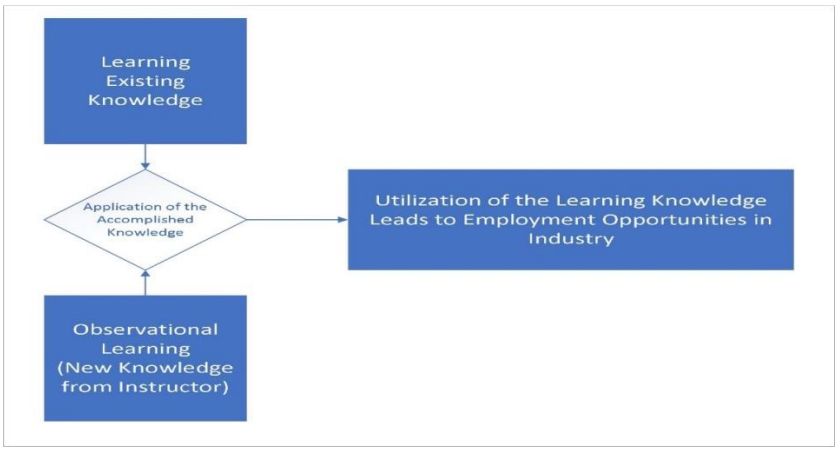

Figure 3-4: Career and Technical Framework (CTE) Theoretical framework

Theoretically this research is built on the work of David Snedden and Charles Prosser.

To meet the 21st century skills demand by the industry, there is need for knowledgeable skilled craft men in every area of construction education to meet the current need of the industry as there is rapid change in technology as well as demand for new skills kept increasing (Ede, 2003; Wells &Walls,

2003), therefore professionals in vocational and technical education are particularly questioned to develop, adapt or redesign policy, conceptual framework to attend to the needs of employees and the public (Hoachlander, 1998; Rojewski, 2002).

Therefore, the adopted conceptual framework for the research understudy is the conceptual framework for vocational and technical education prepared by Rojewski, the major rationale of developing the framework is in other to discuss the employees requirements in sophisticated machines, the updating of the vocational and technical curriculum in order to meet up the requirements and need of the industries worldwide so as to prepare students for employment in the workplace, it examines related matters that has an impact on thinking about vocational and technical essential attributes and the extent the programme will cover in the 21st century. A conceptual framework, therefore, is a graphical drawing linking the major parts, variables, concepts forming the research study. It is a structure inform of a concept map, flow chart, Venn diagram, showing the interrelationship between variables identified in a research study (Rojewski, 2002; Huberman, 1994: 18). Therefore, conceptual framework could be termed as a link between paradigm, explaining the research issueand the application of enquiring into the matter.

A similar explanation by (Punch, 2000) describes the concept incorporating a complex phenomenon showing its linkage. The relationship is shown visually in a schematic plan, web diagram or in a flow chart diagram (Trafford, 2003; Leshem, 2007).

The purpose of conceptual framework in this study tends to fulfil two roles. First to provide a theoretical clarification which has been treated earlier and philosophical clarification of what this study intends to investigate, and second, enabling readers to be clear about what the research seeks to achieve, and how this will be achieved.

3.15 Components of TVET Conceptual Framework

The main parts of vocational technical education conceptual framework are constituted in to five sections as stated by (Rojewski, 2002) to include, syllabus, assessment, programme assessment, instruction and delivery options and student assessment. A comprehensive conceptual framework from (Rojewski, 2002) is illustrated in figure 3.5. The five categories that formed the components of TVET conceptual frameworkwere discussed in sections 3.15.1 through section 3.15.3.

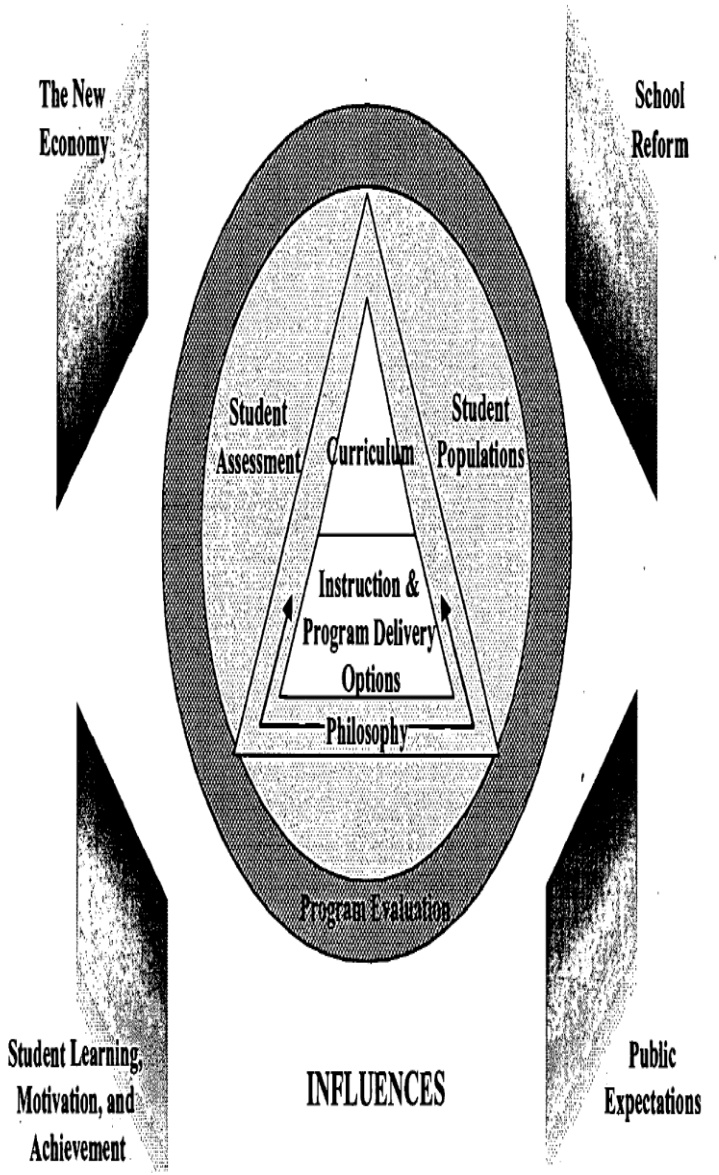

Figure 3-5: CTE conceptual framework (Adapted from Rojewski, 2002)

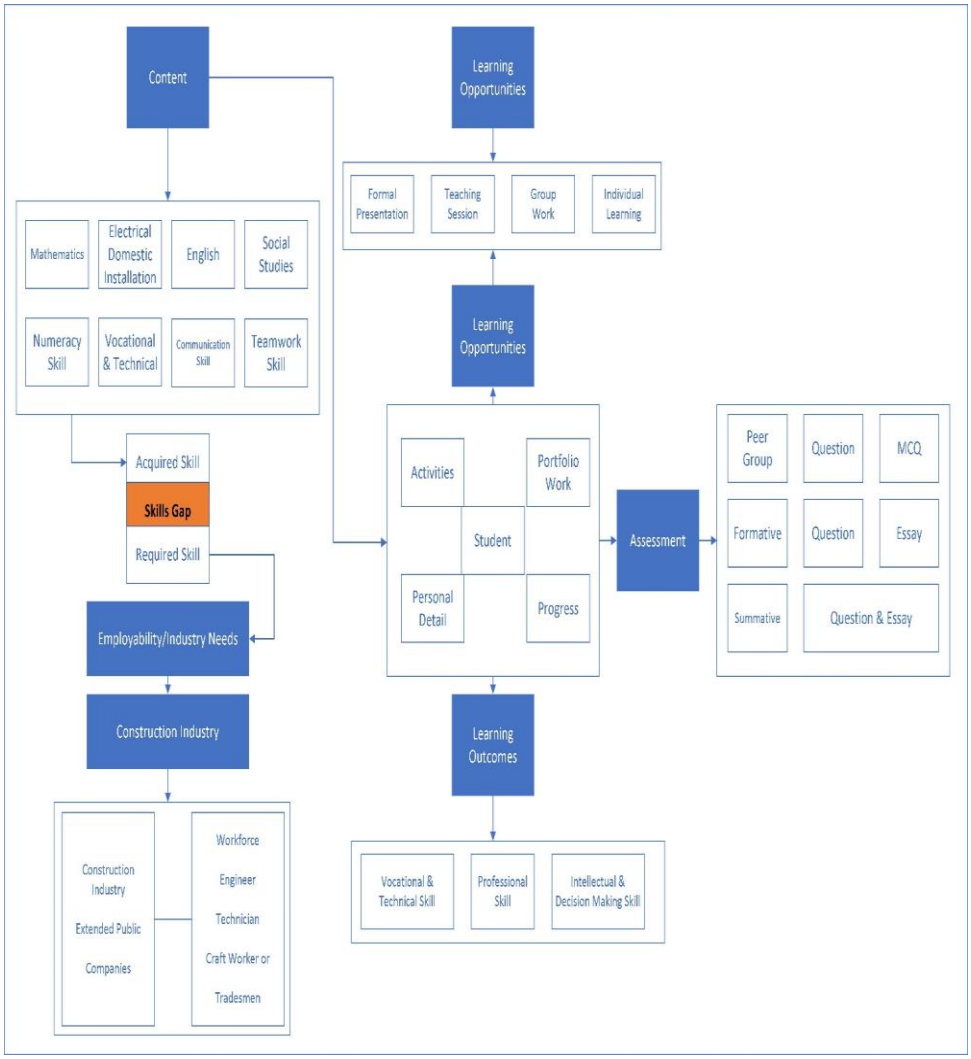

Figure 3-6: Framework for mapping the curriculum with the gap: The author

The diagram in figure 3.6 represents the framework for mapping the curriculum of electrical installation programme with the gap. According to Rojewski (2002), the five sections that are the main parts of TVET conceptual framework are well represented, in order to bring out where the skills gap exists. They are assessment, content, learning opportunities, learning outcomes are those aspects that forms the curriculum of electrical installation programme which transpires between the school and the learner. Through the content of the programme, all subjects were taught to form the skill acquired during learners training. The construction industry who are the end users of the trades' men, that is graduates of technical college have in place the required employability skills for employment. Learners were tested on the amalgamation of skills required by the industry.

The difference between the required employability skills from the industry and the acquired skills learnt by the learners is the skills gap that exist.

3.15.1 Curriculum

Curriculum have been defined by different scholars around the globe, though having different interpretation to curriculum by different scholars, but aiming at the same goal. Although studies by Barrow and Milburn (1990) and Pratt (1994) posited that the word curriculum is obtained from the Latin verb *currere, which means to run,* it equally means ''racing chariot'', though curriculum has some affiliations, to include: curriculum planning, implementation, development, design, evaluation, innovation and host of other aspects, this study seeks to explain and define curriculum in relation to TVET therefore, curriculum is a planned sequence of learning experiences (Harden, 2001). It has also been defined as a process of attaining educational aims and objectives. It is equally a procedure of selecting the theme or content of a programme (Wood & Davis, 1978; Beauchamp, 1977). Some scholars see curriculum as a plan, documents and experiences guiding a course of study, several authors have proposed definition of curriculum (Tyler, 1949) described it as all planned learning experience acquired by the students under educational training institution, for the college to achieve its aims and set objectives. In similar vein, Wheeler (1967) proposed that curriculum is all the planned experiences offered to the learner under the guidance of a school or ant training institution. It is evident to note that curriculum is a plan, or a model for carrying out the college academic activities, which includes learning and instructional methods in other to accomplish the set aim and objectives. Similarly, curriculum is definedas asystematic plan for teaching or disseminating instructional methods to achieve the set target (Tom, 1984). In that vein, Pratt (1994) view curriculum as a master plan or scheme, comprising the learning experiences with instructional methods for the purpose of achieving the stated goals of the course of study. Therefore, the curriculum represents the course of study and the contents therein. It is usually planned for the whole programme or

for a particular unit, of which series of experiences will be learnt in what you intend them to learn.

The experiences include to work in small groups, preparing work for assessment, private study, and attendance at lectures and classes. Marsh (1997) defined curriculum as a form of paper containing contents of a course program with the instructional methods for implementation. Therefore, curriculum development according to Brady (1995) and Nunan (1988), involved the following components: content, objectives,methods and assessment, which have to cover all programs, specifically designed for a purpose. Three types of curriculum have been identified by (Kelly, 1999) and have been structured according to the purpose they are meant to serve. They are planned curriculum, received curriculum and the hidden curriculum. The planned curriculum is what you have in syllabus, the received curriculum is disseminated to students in order to gain experience in their field of study, finally is the hidden curriculum, which is the motivation that implicit the knowledge students to learn (Kelly, 1999).

Other areas of the curriculum that need to be addressed are curriculum planning and instruction, curriculum implementation, curriculum review and curriculum development. Curriculum review is very necessary, so that it can meet up with the requirements of the workplace and the entire nation. The components that make up the curriculum could be examined in the diagram therein in figure 3.6, to include the Content, educational strategies, learning outcome, educational experiences, educational environment, assessment, student learning, programme of work and time table.

Figure 3-7: Curriculum Map Components

3.15.2 Instructions and delivery options

In the times past, instructors believed in the traditional theory based educational delivery system, which presently inadequate for training the workforce skills required in the 21stcentury. It is required that educators should prepare and design curricula and appropriate effective instructional strategies that will be appropriate in content and context to meet the required skills for employment in the 21st century (Mobley, Joyner and Peel, 1998).

For new graduates to get employed in industries requires new method of teaching and learning systems and approaches. New teaching methods and instructional strategies have been supported by several researchers (Bennett, 1986; Creemers, 1994; Hattie, 1992; Marzano, Pickering & Pollock, 2001) to meet the current required skills required in the workplace. There are several selected approaches recognised to teaching and learning in vocational technical education, which are found useful with new methods of pedagogy required of teacher's tasks as,coordinator of learning, collaborators, continuing learners, accustomed with the companyand

making the college a replica of the industry or the workplace (Cotton, 2001; Naylor, 1997). There are six new innovative practices recently gathered, which has been incorporated into existing methods of teaching in TVET. Six approaches are technical preparation, combined vocational and academic education, career academics, work-based youth apprenticeship, cooperative education and school-based enterprises, each of these have been tabulated and discussed in the adapted table 3.2.

Table 3-2: Contemporary Approaches to Teaching and Learning in TVET (Table structure and some content from Biggs et al. (1996). Additional content from Kincheloe (1999)

Approach	Characteristics	Strengths	Challenges
Integrated vocational and academic education	Modifications of academic and vocational philosophies *Applied focus in learning activities *Balances theory with application *Coordination between teachers and counsellors	*Uses CIE settings to apply and reinforce academics *Life-relevant education *Didactic instruction replaced with activity-cantered instruction and problem-solving *Appropriate for all students	Requires organizational change in schools *Requires interdepartmental cooperation and collaboration *Design and implementation takes time *Need for assessing benefits for all students *Need for administrative and community support
Career academies	*School-within-a-school run by team of educators *Career field focus rather than specific job preparation *Integrated academic and vocational content *Includes necessary workplace skills *Employer involvement	*Career focus may keep high-risk students in school	*Scheduling conflicts *Requires involvement of business and industry *Requires collaboration and cooperation between academics and career-technical educators and limited instructional resources
Work-based youthapprenticeship	*Work experience and learning inindustry* *Linkage between secondary andpostsecondary education leading tohigh school diploma and/or post-secondary diploma or certificate *Collaboration among groups *Modelling, scaffolding, fading,coaching	*Creates a learning situation that emphasizes the skills and knowledge required by the workplace	*Requires significant employer participation, workplaces aretransformed *Potential conflict between employers' and students' needs *Requires collaboration and cooperation between schools and employers

Cooperative education	*Operated by traditional CTEprograms *Written training agreements specify what students will learn and employer's responsibilities	*Students obtain part-time jobs *Work-based learning *Use as a screening device by employers for new employees	*Lack of coordination between students' school and work experiences is common *Use as a screening device by employers for new employees
School-based enterprises	*Students produce goods or servicesfor sale to customers	*Students apply academic knowledge to work and gain understanding of business *Instructors maintain control of instructional activity	*Focus can shift to production rather than instruction *Lack of understanding about how learning occurs in the workplace

3.15.3 Assessment

Assessment is a word that forgather all systems used in collecting information about student's comprehension, assimilation, behaviour, ability and appraisal. Assessment could be referred to, tasks undertaken by tutors and by their trainee in evaluating themself that supply information to be used as evaluation to improveteaching and learning tasks in schools (Black &Wiliam, 1998; Kahl, 2005; Wiliam, 2010). There are various forms of assessment, to include the following, diagnostic, formative, summative, formal and informal assessments. Formative assessment refers to constant, dynamic assessments of learners' progression and comprehension to recognize learning requirements and modify method of teaching properly (Looney, 2005). Formative assessment is often referred to as continuous or assessment for training, it is used in changing the studying processso as to have a more satisfactory outcome, and this is a form of assessment carried out on a daily basis. The tutor makes use of formative assessment as an instrument to measure learner's grasp of the subject matter and skills they are teaching. Formative assessment is a tool used in recognizing specific learner misapprehension and errors while the topic is being taught during classroom discussion (Kahl, 2005).

A summative assessment is often compared and contrasted with formative assessment. As the name implies, its motive is to add up, student's achievement, at the end of the session or semester, as the teaching comes

to an end (Stiggins, 2005). The outcome of the students' performance gives both the teacher and the student the final assessment, this gives the final verdict of the learner's performance, being the final assessment, and the result could not be improved upon by the student. Nevertheless, both assessments could be inter changed.

The final assessment in school makes up the acquired skill, which does not equate to the skill required by the industry, this therefore creates what is termed ''skills gap'' in the industry.

3.16 Summary of the Chapter

This chapter discussed and gave a brief description of the geographic context of Nigeria. It emphasizes the contributions of the Nigerian construction industry in terms of its economy and the National development of the country. Review of education and training in Nigeria was thoroughly explained and the system of education was discussed to initially be 6-3-3-4 later reviewed and changed to 6-5-4. Presently, Nigeria is operating on 9-3-4 system of education termed the universal basic education. Each of the stages of education embraced in Nigeria was discussed and consist of Pre-primary to primary education, then the junior secondary school to the senior secondary school and tertiary institutions of learning. The theories of learning were explained to consist of behaviourism, connectivism and constructivism learning theories. Constructivism learning theory is adopted for this study, and the major implication of this theory was to link the research with education, this brought about the recently adopted learning methods for TVET which include learning by imitating, conversation, teaching and helping, learning by watching and host of other methods of learning.

The philosophical and the conceptual framework guiding the study was thoroughly explained. The philosophical stand adopted for this research is pragmatism and Rojewski conceptual frame work was also adopted. Various delivery options were explained in figure 3.2 to consist of work-based youth

apprenticeship, co-operative education, school base enterprises and host of others recently embraced.

In order to deliver the right balance of skills to the industry, curriculum design/ mapping framework is designed such that the educators views will be explored, and it will serve as a guide in understanding areas of skills the instructors will apply more efforts during teaching and assessment of their students.

Chapter 4 : RESEARCH METHODOLOGY

4.1 INTRODUCTION

The review of literature in chapter two, has established a gap in the literature on the students' craft skills in Nigeria, skills gap among the skilled craft men in developed countries were reviewed. The skills gap among craft workers in the construction industry, evidence and factors causing skills gap in Nigeria were equally examined and analysed. Chapter three, has provided an overview of vocational technical education, learning theories and mapping the curriculum to industry needs. Section four will contribute an outline of the conceptual representation and measurement structure that depicts a significant progression towards closing the knowledge gaps relating to skills gap and challenges of training that exists within the skilled labour force. To practically validate the conceptual model and utilize the measurement framework, this section profiles how the research was executed by exploring the philosophy, techniques and methodology, that were utilized in collecting and validating the data. The research techniques used were focus group interviews, and surveys using questionnaire. The combination of these techniques assisted us in gaining sound and detailed of information in order to achieve significant results. The research design including the strategy, method, the approach, and the techniques of data collection, the research process, the sample selection methods, the type of data analysis, the ethical considerations and limitations of the research will be discussed.

4.2 RESEARCH PHILOSOPHY

Several approaches were laid down for conducting research in social science as asserted by philosophical aspects of key concepts such as ontology, epistemology, and methodology. Ontology and epistemology relayed conflicting ideas on what knowledge is, our ways of thinking, and our connection with nature (Walliman, 2006). Research methodology, therefore, is more concerned with the idea of data collection (David and Sutton, 2004). The three concepts of social science research are ontology, epistemology, and methodology. They are prominent and vital for any research in the field of education because they describe basic presupposition on the existence of reality and suitable methods for constructing one's knowledge of reality (Beynon-

Davies, 2002). Therefore, the basic function of research design is to shape the selection and apply underlying theory upon which it is based for the choice of suitable methods to apply (Crotty, 1998).

The key concepts of social research (ontology, epistemology, and methodology) are interrelated with different broad paradigmatic approaches that have emerged over time but with four main ones: positivism, constructivism, post-positivist, and critical theory. These four main paradigms of social research must be regarded as ideal (Patton, 1998; Smaling, 1994).

According to Blaikie (2000: p. 100), each research strategy has a theoretical groundwork, and comprises metaphysical presumption about the nature of reality a philosophical assumption about how reality can be known. He stated thus; the strategies provide differs ways to answering research questions by specifying a starting point, a series of steps and an end point".

The table 4.1 below adopted from Lincoln and Guba (2000), describes the four main strategies of social research.

Table 4-1: Basic Beliefs of Alternative Inquiry Paradigms: (Lincoln and Guba (2000: p. 165)

Item	Positivism	Post- Positivism	Critical Theory et al	Constructivism
Ontology	Naive realism "real" reality although apprehendable.	Critical realism - "real" reality but partially and probably apprehendable.	Historical realism - virtual reality influenced by political, social, ethnic, economic, cultural, and gender values; formed over time.	Relativism - local and specific constructed realities.
Epistemology	Dualist/objectivist finding truea.	Modified objectivist/dualist; community/ critical tradition; findings likely true.	Transactional/ Subjectivist; value-mediated findings.	Transactional/ Subjectivist/ created findings.
Methodology	Manipulative/ experimental; hypothesis verification; principally quantitative procedures	Manipulative/modified experimental/; critical multiplism; hypothesis alteration; may involve qualitative procedures..	Dialogic/ Dialectical.	Hermeneutical/ Dialectical.

Conducting research in social science is centred within the philosophical features of epistemology and ontology (Creswell, 2009; Walliman, 2006). This shows contrary opinion about the exact representation of knowledge, our thinking patterns, and relationship with nature (Tashakkori & Teddlie, 2010; Walliman, 2006; Beynon-Davies, 2002). Methodology is basically in connection with collection and analysing data, it has a unique connection with methodological and ontological assumptions (Creswell, 2009; Walliman, 2006). Guba (1990) defined research paradigm as a mix of epistemology, ontology and methodology. Therefore, there is need to establish the meaning of the following terms in order to comprehend the effect of ontology and epistemology.

Table 4-2: Definitions of Research Methodology

Beynon-Davies (2002, p. 559)	''Assumptions on which research approaches are suitable for obtaining logical evidence''

Crotty (1998, p. 3)	''The strategy, design or process supporting the choice and utilization of specific methods and associating this choice and utilization of methods to desired outcomes''
David &Suttonj (2004, p. 365)	''Common techniques and styles of data collection''

Table 4-3:Definitions of Epistemology

Walliman (2006, p. 15	''How we know things and what we regard as acceptable knowledge''
Bryman (2004, p. 11)	'' What should be or what is considered as acceptable knowledge in a discipline''
Hickey et al. (2010, p. 3)	''What can we claim to know about the ''Reality'', and is such knowledge a form of truth? Can we explain or merely describe?''

Table 4-4: Definitions of Ontology

Beynon-Davies (2002, p. 559)	''That branch of philosophy that encompass the theories of realities''
Hickey et al. (2010, p. 3)	''What can the world be said to consist of? Is reality ''real'' or only relative to particular constructed realities?''
Wong (2010, p. 4)	''The theory of existence, or more narrowly, what really exists as opposed to what seems to exist.''

4.3 RESEARCH DESIGN

In selecting a suitable research methods and strategy for responding to research questions, confusion often arises in the process of research. Research design was designed by Yin (2003) as "the logical sequence that connects the empirical data to a study's initial research questions and, ultimately, to its conclusions". In that vein, research design was defined by Creswell (2009) as ''the procedures and plans to execute research including the convergence of three elements, the strategies of inquiry (i.e. research strategy), philosophical worldview (i.e. methodological paradigm), and definite methods (i.e. research methods)''. The three major types of research design that are commonly in use are the quantitative; qualitative; and mixed method (Onwuegbuzie, 2004; Tashakkori& Teddlie, 2010; Fellows and Liu, 2015; Creswell, 2013).

The researcher will choose a suitable design for the study under focus, Creswell (2009) recommends that the decision should be drawn from the three elements of research design. In selecting a pertinent research design for this study, the tripartite framework model of Creswell (2009) will be adopted.

It is clearly shown from the research objectives that the research involves measurement and mapping. The reality pragmatist is well noted for the adoption of measuring and mapping observation phenomenon (Onwuegbuzie, 2004; Tashakkori & Teddlie, 2010; Creswell, 2013).

This study will adopt the mixed method approach which has been in use among the field work social scientists and social anthropologists as early as 20th century. Creswell (2013) and Johnson *et.al* (2007) claim that mixed methods research has

developed since the 1990's to be the third methodological or research paradigm co existing alongside quantitative & qualitative research.

There are various worldviews or paradigms adopted for mixed method approach ranging from pragmatism, constructivism, and host of other paradigms.

4.3.1 Positivism Approach (Objectivist)

This approach utilises the quantitative examination options such as surveys and experiments (Cohan et al., 2000). Hence, the positivism approach applies quantitative techniques to generate data in an effort to generalize conclusions via a process of deduction (Saunders et al., 2007). In the last two centuries, the most remarkable feature of social science has been the rise to dominance and subsequent fall of positivist tradition (Smith, 1998). From the perspective of the positivist approach, scientific discoveries are accomplished by objective observations and measurement, and the careful and accurate analysis of data (Lincoln and Guba, 2000). One of the major principles of positivism is that something is meaningful if and only if it can be observed objectively by the human thinking (Borg, 1989). Hence, this is an objective approach that establishes causes and effects to test theories and create scientific laws (Walliman, 2006). The social science researcher who followed the positivism approach considers the social world as a natural phenomenon, by being real, hard, and external to people, and therefore measurable

The ontological assumption of positivism is concerned with a well-structured sphere, made up of separate and observable events that allow for generalization between concepts, while the epistemological assumption is concerned with knowledge shaped between the application of the human sensation and by means of experimental analysis (Blaikie, 2000). Hence, Hickey et al (2010: p.5): refer to effects of positivism as being that, "Positivism privileges the mental and physical regularities of human life rather than meaningful experience." In the positivist approach, the researcher must be as 'objective' as possible, wherein the researcher's feelings, values, interpretations, and musings have no place (Sarantakos, 1997).

However, the positivist approach had faced some challenges. For instance, the uses of the 'objectivity' concept have been challenged by many researchers (Hempel,

1966; Hindess, 1977 Popper, 1961). Furthermore, Borg (1989) highlighted the following claims. The positivist approach concentrates exclusively on behaviour and rejects all internal experiences being outside the area of scientific inquiry. It does not consider the social values of communities and depends only on academic validity. It aims to achieve 'laws' of human behaviours or 'generalizing' to all environments at all times, even it is used to accomplish such goals in social science. As a result, the qualitative interpretivist approaches had emerged in response to these claims as viable alternatives to the positivist approaches (Lincoln Cohen et al., 2000). These include the constructivism approach and post-positivism approach, both of which will be discussed in the following.

4.3.2 Constructivism Approach (Interpretive)

Understanding the social world and social action is the main emphasis of the constructivism approach (Lincoln & Guba, 2000; Cohen et al., 2000). It is connected with an array of interpretive approaches to social enquiry (Lincoln and Guba, 2000). Thus, this approach is widely known as the interpretive approach for it focuses on interpretations and meanings (Walliman 2006). Lincoln and Guba (2000) argued that the positivist approach is concerned with forming such patterns in explanatory arguments. On the other hand, the constructivism approach argues, concerning the analytical structure are not understandable on their own, and it is mandatory to inquire what motivates human into actions that lead to such patterns.

Researchers, who view the social world as human-created for being personal, softer, and subjective, use the subjectivist approach. This approach tends to select qualitative research techniques such as a participant observations and personal construct (Cohan et al., 2000). Hence, Saunders et al. (2007, p. 120): affirms that, the "Interpretive approach apply qualitative methods to collect data by the process of induction, which may not yield a positive outcome, where there is less concern with the need to generalize."

The ontology assumption of the constructivism approach views social reality as the social construction of social actors: mutual knowledge-meanings, social institutions, cultural symbols. These interpretations facilitate social relationships. While the

epistemological assumption is concerned with the daily opinion and denotations. It is socially constructed from the mutual knowledge (Lincoln and Guba, 2000).

However, the interpretative approach has faced some challenges. For example, researchers have questioned the validity of research produced by a subjective instrument (i.e. the researcher?); and how can researchers know the minds of others, the meaning that they give to their action? (Hickey et al., 2010).

4.3.3 Post-Positivism Approach (Critical Realism)

Popper (the founding father of the philosophy of science) first developed the post-positivism approach, known as "critical rationalism" (Phillips, 1990). According to Crotty (1998), the post-positivism approach is located within the wide range of historical convention of positivism and still keeps a number of its characteristics.

However, the post-positivist approach has developed a logic that is the reverse of that advocated by positivism. It consents that all data collection is selective based on the interpretation of the observer, before it can develop a proper logic (Lincon and Guba, 2000; Blaike, 2000). Hence, the critical realism approach is convened somewhere in-between the two previous approaches by developing an analytical framework even though with an understanding of the subjectivities of practice and perception (Hickey, 2010)

The ontological assumptions of the post-positivism approach also share some of those of positivism. However, it rejects positivism epistemological assumptions, and believes that social life and nature are comprised of essential uniformities (Chalmers, 1982; Lincon and Guba, 2000). Popper (1972: p. 47) placed an argument regarding the post-positivism approach in the following manner:

"The aim of science is to establish generalization that corresponds to these uniformities and theories that explain them. However, is not possible ultimately to establish whether such generalizations or theories are true, all that can be done is to eliminate false theories, thus getting closer to the truth".

The post-positivist approach had also been criticized. The major criticisms of the post-positivist approach include the procedure of accepting and rejecting theories,

which involves psychological and social processes, not just logical ones. Furthermore, paying much attention to logic will suffocate scientific inventiveness (Lincoln and Guba, 2000; Chalmers, 1982).

4.3.4 Pragmatism

Pragmatism is a logical belief that can be traced back to the scholastic sceptics of classical antiquity who denied the possibility of achieving real or genuine knowledge about the truth and taught that we must adhered to with credible information adequate to the needs of operation (Stuhr, 2000). Although, pragmatism is a philosophical doctrine that originates from Charles Saunders Peirce, he sees, pragmatism basically as philosophy of meaning, with the understanding of any concept that has application in the sphere, lying in the relations that link the experiential conditions of application with observable outcome (Stuhr, 2000).

Pragmatism was identified as a philosophic alternative to abstract and logical science by James (1907), Dewey (1931), Pierce (1931) and Mead (1938). Pragmatism has an interest not only for what 'is', but also for what 'might be'. The foundational highlight in pragmatism is not conceiving an action as an end. Though, it is emphatically an American philosophical tradition. It is asserted that the truth of all beliefs, knowledge and scientific concepts is provisional and defined by their pragmatic use in the ongoing occurence, not by correspondence with antecedents Truth or actuality.

There is a growing interest in pragmatism within organisational and informational studies (Wicks &Freman, 1998; Goles & Hirshheim, 2000). Pragmatism has been seen as a viable alternative to positivism and anti-positivism.

4.4 The Chosen Paradigm

This research will explore the actual appropriateness of pragmatism as a research paradigm through the sampleof a piece of pragmatic investigation that only apply toeither quantitative and qualitative research methods or mixed methods.

In this research, the pragmatist approach will be endorsed as the overarching paradigm and, that dictates both quantitative and qualitative inquiry and, as the philosophy of vocational technical education is multifaceted, this study is based on pragmatist philosophy, which gives room for mixed methods.

The method most commonly associated with mixed methods research (Teddlie & Tashakkori, 2009, p.7), although clearly not the only one, is pragmatism. It provides alternative worldview to those of positivism/post positivism and constructivism and create awareness on the challenges to investigate and the consequences of the research (Tashakkori & Teddlie, 1998; Creswell & Plano Clark 2007, p. 26; Brewer &Hunter, 1989 p. 74; Miller, 2006; pp. 29-30).

In several instances, pragmatism and mixed methods study are examined to be compatible with each other. Different kinds of paradigm exist, pragmatism is one of those paradigms that support using a blend of research methods.Taking pragmatic approach gives room for carrying out mixed method research. Mixed method has been designed to combine both qualitative and quantitative methods in order to satisfactorily answer the research questions.

Research methods sharingsame ontological perspectivecould be combined since they both see the nature of the world in the same way. Guba and Lincoln (2005) posited on combining methods considering you don't mix worldviews.

Pragmatics are knowledgeable of various ways methods of interpreting the world and conducting research, consequently pragmatism is deep rooted in the empiricist and experiential camp of philosophy, contending against the metaphysical presumptions of rationalism and focussing on how humans adapt to their environment by incorporating new experiences during their practice. (Harmmersley 1989: 45-46).

4.5 Research Strategies and Methods

'Research methods' is defined by Sandelowski (2000) as ''the procedures and rules developed by social scientists to guide inquiry of a problem in a systematic manner, and to link conceptual or theoretical ideals with empirical data (quantitative and qualitative information)''. Research methods is defined byCrotty (2003) as a procedure, process, plan of action, or design guiding the selection and utilization of particular methods and linking the choice and utilization of these methods to the desired outcomes. Aim of research methodology in this investigation is to support

selection of data collection methods with a view to help research study deal with research questions.

Despite the fact that the philosophical position adopted for this research is pragmatist, investigators also, support research strategy and specific methods to collect and analyse data. The research strategy make provision for a certain pathway for procedures in a research design (Creswell, 2009). 'Research methods' is defined by Wong (2010, p. 2) as ''the procedure and rules developed by social scientists to guide inquiry of a problem in a systematic manner and to link theoretical or conceptual ideas to empirical data (quantitative and qualitative information)''. The aim of research method in this research is to support selection of data collection with a view to help researcher deal with research questions. Quantitative, qualitative and mixed method strategies are the three most popular research strategies.

4.5.1 Quantitative Research Strategy

Quantitative research method is a distinctive research strategy. According to Fellows & Liu (2008); and Bryman (2004), in broad terms, quantitative research is entitled to gather and assemble numeric data, exposes the association inbetween theory and research as deductive. Quantitative research uses objective and numerical measurements to provide answers to questions. It is beneficial in providing answers to research questions relating to how much, what, and how many (Creswell & Plano Clark 2007; Fellows and Liu, 2008). Instrument-based data are gathered by quantitative researchers using close ended questioning (e.g questionnaire). Quantitative researchersuse statistical methods to analyse datain order to reach conclusions. Large data sets and representative samples are usually obtained, experiment and survey are the two major quantitative strategies (Creswell & Plano Clark 2007); in construction education research, the most generally used research strategy is survey. This strategy is a robust procedure that is principally used to evaluate a phenomenon by utilizing a sample that represents a whole population Survey facilitates numeric expressions of trend and opinion, thus allowing deductions to be made from a sample to a population (Creswell & Plano Clark, 2007). Questionnaire is the principal data-gathering instrument used in surveys that may contain open-ended/closed-ended questions.

Questionnaire survey varies from posted and self-administered questionnaires to web-based questionnaire such as Survey Monkey, KwikSurveys and QuestionPro, which are becoming increasingly popular (Creswell, 2014).

4.5.2 Qualitative Research Strategy

Qualitative research focuses on determining the meanings given by participants. It avoids experimental work such as numerical measurements. Instead, it emphasizes the social meaning of constructs as viewed by the participants (Tashakkori & Teddlie, 2010; Sanders, 2009) and facilitates the interpretation of relationships between variables [Creswell and plano, 2007; Bryman, 1998]. Hence, researchers using the qualitative research method try to familiarize with the morals and cultures of respondents in order to emphasize the meanings. Qualitative data is collected by different measures including gathering documents, observing participants, collecting audio-visual materials, or sites of research (Tashakkori & Teddlie, 2010; Creswell and plano, 2007). The well-known method for gathering qualitative data is through interviews (Morse, 2003). Interviews are often open-ended with selected participators and members granting them the permission to express themselves in their own words (Creswell and plano, 2007). Therefore, qualitative research techniques can capture the decisions that people make and reasons for making them (Morse, 2003). Many qualitative research strategies exist, for example, Wolcoot (2001) identified nineteen of such strategies whereas Tesch (1990) identified twenty-eight. However, the most frequently used strategies were presented by Creswell (2009), they include ethnography, grounded theory, case study, phenomenological research and narrative research.

4.5.2.1 Ethnography

According to Denscombe (2014), the research methodology where the researcher is in touch with a focus group in their abode for a long time is ethnography and this facilitates the collection of both artefacts and observational data by the researcher in support of a fact. Through this method, the research question is deeply understood, and researchers understand the acts and reasons behind the actions of the understudied cultural group. Ethnography's strength lies in its versatility and approach for lived realities (Walford, 2010). Robson (2002) states that this form of

research procedure, still, encounter challenges in area of validating the research, probably due to the great involvement of the researcher in the study.

4.5.2.2 Grounded theory

This theory is universally observed as a qualitative research strategy and its intention is to develop a theory using inductive approach and data collection procedures such as interviews and participants observations (Robson, 2002; Creswell 2007). This theory is a form of research approach wherein the theory of a process is derived and deeply rooted in other participants views (Creswell, 2014). Unstructured and semi-structured interviews are examples of research methods that are frequently used in grounded theory.

4.5.2.3 Case study

Case study research, are applied in nearly all the fields of learning, reading through past documents of past studies, brought about the investigation and apprehension of compounded issues. It can be viewed as an all-encompassing research method especially when a holistic and detailed investigation is needed. It is widely recognised as an instrument in many social science studies, case study functions become more prominent with issues related to education prospects and challenges (Gulsecen & Kubat, 2006) were raised. Case study directs the whole process of conducting and executing the research. Case study strategy according to Saunders et al (2009) is the masterplan of how the investigator get the research questions answered. Saunders et al (2009) mentioned that an ideal research strategy must be established from the research questions and objectives, what is already known in the subject area to be researched, the quantity of available resources and time, and the philosophical underpinnings of the investigator, all which the understudy research is based upon. There are many reasons for selecting case study research as suggested by (Yin, 2003) to include 1. Type of research questions presented, 2. The degree of authority the researcher possesses over real behavioural events, and 3. The degree of focus on immediate issues. Appropriately, when the research questions were asked in the form of "how" and "why", case study was selected. Case study is defined by Yin (2003b) as an "empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon

and context are not clearly evident; and in which multiple sources of evidence are used". Case study is defined by Dul and Hak (2008) as "a study wherein (a) one case (single case study) or a limited amount of cases (comparative case study) in their real-life scenario are chosen and (b) scores derived from these cases are evaluated in a qualitative way. Former reports on case studies indicates the investigations and understanding of compounded issues. It is a robust research method especially when a comprehensive and in-depth investigation is recommended. Recognised as an instrument in social science studies, the role of case study method in research becomes more important and outstanding when issues concerning education (Gulsecen&Kubat, 2006) were raised. Case study provides the entire pathway of the research in addition to the research execution process. According to Saunders et al (2009) case study strategy is "the general overview of how a research question will be answered by the researcher". Saunders et al (2009) mentioned that proper research strategy must to be chosen based on research objectives and questions, the extent of established knowledge of the subject matter to be researched, the amount of resources and time available, and the philosophical underpinnings of the investigator, all which the understudy research is based upon. Choosing case study research according to Yin (2003) is based on some main factors, to include the following these were 1. Category of research questions posed, 2. The level of influence the researcher has on real behavioural events, and 3. The degree of focus on immediate issues. Accordingly, case study was preferred when the research questions took the form of "how" and "why". The research understudy is reported to answer the research questions of 1. How can we measure the skills gap in relation to the most important skills demand by the industry? 2. How does curriculum design of vocational education contribute to the failure to satisfy skills demand of the construction industry? 3. How can the vocational education sector improve their contribution to the sector through improve curriculum design? The research question can be seen to consist of "how" type of research questions, identifying with a case study research.

4.5.2.4 Phenomenology

Phenomenology is one of the qualitative research strategies that search for understanding the meaning of experiences to people, providing insight of personal experience and what determines their activities and motives (Creswell, 2007; Park, 2012). The Husserlian's phenomenology emphasized the main aspect of the human context in understanding life; that is, investigators and readers of research can understand human experience because they are participators in the human condition. Therefore, the function of understanding is to carry on with what is already experientially evident and familiar to us as humans.

In most cases, experiences could be gathered through other means like diaries, documents and visual process. The phenomenological investigator is an intermediary between voices and experiences of the research participators and the entire interested people in the community. Phenomenological; research adopts purposive sampling, it could also make use of systematic sampling as another strategy (Todres& Holloway, 2004). This study adopts the Phenomenological strategy because of the nature of its methodology.

4.5.2.5 Narrative research

This type of study is another form of qualitative research procedure, where the investigator collects and assemble data for analysis. Participators were invited to deliberate and discuss issues pertaining to point of discussion and their experiences individually in chronological order (Creswell, 2007). Narrative form of investigation is a systematized procedure by which the investigator collects, analyse, and represent people's stories as rehearsed by them, which disagree with conventional and contemporary views of actuality, truthfulness, knowledge, and individuality.

The research of this nature could be analysed applying idea derived from theory, samples from thematic analysis or concepts derived from the data like in grounded theory and applying analysis of narratives (Creswell, 2007).

4.6 Mixed Method

Mixed method is the combination of both the quantitative and qualitative strategies in one study (Tashakkori and Teddlie, 1998; Morse, 2003). The method requires the application of both quantitative and qualitative data collection and evaluation methods in one study (Creswell, 2009). Gathering and assembling of both qualitative and quantitative data helps in analysis. It gives a better, clearer, and deeper cohesion of a phenomenon (Creswell, 2009). Utilizing more than one method in research contributes greatly to balance in interpreting scientific and social phenomena embedded in the programme being studied. Mixed method was also defined by Creswell (2009) as the designs that involve at least one qualitative method (patterned to collect words), and quantitative method (patterned to collect numbers), where neither type of method is inherently connected to any specific inquiry paradigm or worldview.

Employing mixed method approach enables researchers to expand the scope and develop the analytic power of their studies (Sandelowski, 2000).

Creswell, (2009) had identified several reasons for using the mixed-method approach. Quantitative approach and qualitative approach help each other in many stages of the study. Quantitative study aids the qualitative research throughout the design stage by interpreting the representative sample. Moreover, quantitative study supports the qualitative during data collection through supplying the background data. Finally, quantitative study helps the qualitative in the analysis by demonstrating the generality of specific observations. On the other hand, qualitative study helps quantitative study during the design stage by aiding the conceptual development. Moreover, qualitative study helps the quantitative during the data collection by providing opportunities for some specific (intensive) enquiry. Finally, qualitative study helps the quantitative during data analysis by helping throughout with validation.

4.6.1

Triangulation in Research

This is a procedure to gain credibility and confidence in research understudy. It is used extensively in social sciences and it has also been applied in construction management research (e.g. Ankrah, 2007; Tuuli, 2009; Manu 2012). Triangulation in research involve using more than one approach to researching a question(s). Triangulation in research involve using more than one approach to researching a question (s). Triangulation is the process of validating the result of a study through two or more methods to check its reliability and validity (Creswell and Clark, 2017). The major objective of triangulating a research is to increase and gain confidence in the findings through the confirmation of a proposition applying two or more independent measures (Johnson and Onwuegbuzie, 2004). The combination of findings from two different approaches gives a more authentic result than from a single approach (Johnson and Onwuegbuzie, 2004).

Triangulation relates to research methods and designs. However, there are variations in the use of the term. It may be the use of multiple theories, data sources, methods or investigators in studying of a single phenomenon (Johnson and Onwuegbuzie, 2004). Triangulation was introduced into qualitative research in order to avoid potential biases arising from the use of a single methodology. This procedure is used to make sure that the findings are real, but it could also be applied in determining the completeness of data (Creswell and Clark, 2017). There are various forms of triangulation methods available ranging from data triangulation, investigator triangulation, theoretical triangulation and methodological triangulation (Creswell and Clark, 2017).

The most common method used in triangulation is the methodological triangulation. Research studies that apply triangulation may include two or more sets of data collection using quantitative and qualitative methods. The limitation from each method could be transcended by comparing findings from different angles (Creswell and Clark, 2017).

Triangulation is often used to describe research where two or more methods were used, as in mixed methods. The combination of both the quantitative and the qualitative methods is often referred to as mixed methods or triangulation. The combination of both methods may result in giving same conclusions, the result may relate to different objects or phenomena but may be complementary to each other and used to supplement the individual results and the results may be divergent or contradictory (Creswell and Clark, 2017). Merging of results aim to increase the validity through verification; complementary results highlights different aspects of the phenomenon and divergent findings can lead to new and better explanations for the phenomenon under investigation.

Carvalho and White (1997) propose four reasons for undertaking triangulation to include enriching, refuting, confirming and explaining of the hypothesis generated from another set of opinions.

4.7 The Selected Strategy

The use of the mixed method by integrating both approaches, quantitative along with qualitative, is thus essential and valuable (Johnson and Onwuegbuzie, 2004). Hence, employing both quantitative and qualitative approaches will give rise to more confidence in the research findings (Bryman 2004). Combining quantitative and qualitative research methods will enhance validity, reliability, and generalizability of findings. Thus, this research will combine both approaches, the qualitative and qualitative approaches to examine the issue of ''skill gap assessment and challenges of training the skilled labour force in Nigeria.

On the other hand, the rationale behind using the mixed method lies within the research questions formulated, the stated objectives and the adopted pragmatic philosophical position underpinning the understudy research, comprising of both that arequantitative and qualitative in nature. The quantitative will be using questionnaire to collect data from the (electrical supervisors & managers) from the companies, because they are in the best position to give opinions about the technical college graduates serving under them. The qualitative strategy will be using focus group interview for the electrical instructors because of their experience and

knowledge to seek for their opinions and perspectives on the phenomenon understudy for which gives room for mixed method to be used.

In using mixed methods, various ways of grouping exists and three basic classifications are very popular (i) convergent parallel mixed methods: both quantitative and qualitative data are run simultaneously and the result are differentiated; (ii) explanatory sequential mixed methods: this method begins with the collection and analysis of quantitative data followed by qualitative data collection and analysis; and (iii) exploratory sequential mixed methods: this begins with qualitative data assemblage and evaluation followed by quantitative data collection and evaluation in an independent manner (Creswell, 2014).

4.8 Exploratory Sequential Mixed Methods Design

In an exploratory sequential mixed method design, a study begins by investigating qualitative data and utilizing the outcomes to deduce how data will be collected and analysed. It has been found that a research problem with unique characteristic of the population is better understood through qualitative (Creswell, 2014) Exploratory sequential thus enable the researcher to appraise whether individualistic results can be applied to a larger population. An exploratory sequential mixed method design is adopted in this study (Fig. 4.1).

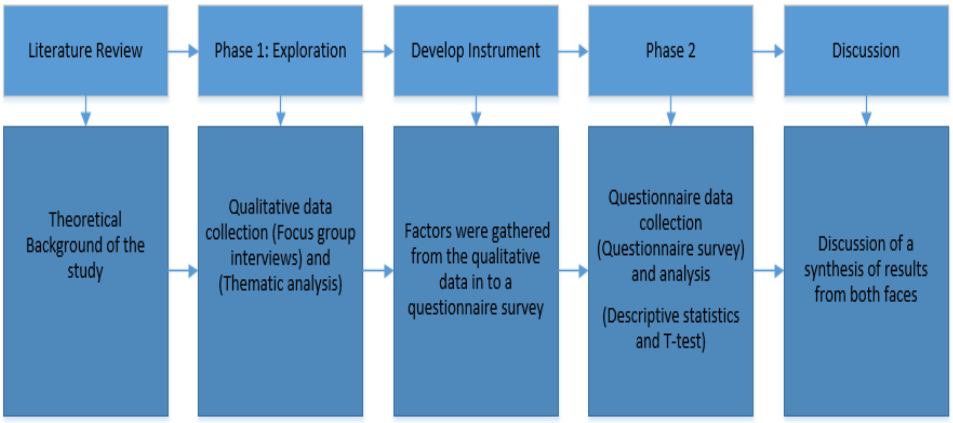

Figure 4-1: An Outline of the Sequential Exploratory Mixed Method Design

The aim of the exploratory sequential mixed methods study is to standardize and highlight the type of mixed methods strategy used in supporting the skills gap assessment in enhancing the implementation of technical and vocational education.

The study begins with a review of relevant literature to pinpoint skills and skills gap in the construction industry, evidence and causes of skills gap in construction companies in Nigeria.

Different types of data collection methods were utilized in order to have a well-grounded apprehension of the understudied phenomenon, while triangulation method was utilized for corroboration of data collected for the research (Creswell, 2014).

The second design which is sequential exploratory mixed method approach utilized consisted of two major stages, namely:

Stage 1: The qualitative data collection phase and analysis: After conducting the extensive literature review, the phenomenology approach was used to gather textual data via the focus group interviews. The thematic analysis procedure was used to analyse the data and the themes and sub-themes within the data were uncovered through coding.

Phase 2: This stage covers the quantitative data collection stage and analysis, this phase was built on the previous phase (phase 1) Questionnaire survey was utilized to collect the quantitative data for the researchunderstudy, the statistics was subjected to descriptive statistics and t-test.

In collecting the qualitative data for the study, the focus group interview was conducted which helped to corroborate the phenomenon understudied using a small sample size. Nevertheless, a great deal of time is required to plan and cumulate of qualitative data and a level of experience and mastery is required to analyse and interpret the data. Hence, after an extensive appraisal of the literature on skills gap, implementation of qualitative investigation involving Focus Group interviews (FGI) with the professionals, heads of electrical installation departments in Nigerian technical colleges was accomplished. The focus group interviews created a means to bring together real-life discussion team participators with the aim of deliberate upon the issue of curriculum, curriculum design, teaching of skills, curriculum improvement guiding electrical installation programme in the study. Focus Group interviews was selected over interviewing individual participator since it allowed

participators to draw opinions from their experiences and further allowed them to build on the responses of others. Through the focus group interviews, in-depth insights into common beliefs and group thinking are obtained (Denzin and Lincoln, 2000). It was mandatory to administer the focus group interviews and it was moderated proactively by the researcher in order to sustain the participation and openness from each focus group member. The participators were urged to openly deliberate on qualities that are eminent for curriculum development, design and advancement of electrical installation programme. Deliberation and discussions among the focus group participators was recorded and later compared with all documentation that emanated from the interview to confirm that all useful information was derived.

Table 4-5: Qualitative and Quantitative Methods

Objective/question	Approach/methodology	Data collection methods/ Analysis
Developing a framework for the measurement of skills gap in industry	Quantitative approach to be adopted	Survey using questionnaire/ Statistical analysis using SPSS
To design a framework to assess the curriculum of TVE with a view to map the curriculum with the gap	Qualitative approach to be adopted	Focus group discussion/ Thematic analysis

4.9 RESEARCH TECHNIQUES

Research techniques are processed that are employed in collecting, analysing, interpreting and representing data, the techniques that are used in this study were questionnaires and focus group (Figure above). According to Beynon-Davies (2002), various techniques gives ‘’a more complete overview of some phenomenon by exploiting the intrinsic robustness of each technique thus, facilitating efficient data collection and analysis and attaining conflicting or matching results. To accomplish the aim and objectives of this study, pragmatism approach was acquired. These approaches involved qualitative and quantitative research procedures, incorporating

mixed methods for substantial confidence in the research findings (Bryman, 2004). The research questions and objectives investigated also support a combination of various techniques, in data collection and analysis. For example, the objective of evaluating the skills gap support a questionnaire survey technique to discover measuring strategies, whereas the objective of mapping the curriculum with the gap favoured a method that warrants a focus group interview. A principal attribute of a case study research is the aptitude to allow the utilization of various research techniques, both quantitative and qualitative (Yin, 2003; Gerring 2007). Hence, it was justified to utilize questionnaire survey and focus group discussion as the data collection techniques, whereas statistical analyses' employing descriptive statistics was employed. Analysis will be conducted using SPSS, while the focus group discussion will be transcribed, coded and analysed thematically (Creswell, 2009; Rose et al., 2015). Established on the researcher's underpinning philosophical views, the research is situated within the philosophical viewpoint of a pragmatist. Pragmatism is established on the premises "the most critical determinant of the ontology and epistemology you adopt is the research question, therefore, the research is situated and addressed from a pragmatist viewpoint (Saunders et al, 2009). Notwithstanding the fact that case studies can be carried out by utilizing a positivist approach; for example, see Rezgui and Miles (2010), it is commonly linked with interpretivism/realism and pragmatism. Furthermore, several research strategies were planned by Sexton (2007) on a continuum of ontology and epistemology spectrums.

4.10 Population

The aim of this study is to create a measuring and mapping framework to address the construction skills gap through improved vocational and technical education and examine the desired employability skills sought by employers in the construction industry. Creswell, (2009) defined population as an individual or group or category of interest. The target population for this study will include registered electrical contractors (within which, are prospective respondents/participants such as technical managers, supervisors, and head of personnel instructors) and technical education colleges, (within which are prospective participants such as electrical

education instructors/tutors, department/unit heads and programme/course leaders). The target population is being chosen owing to the fact that they acquire wealth of experience and competency in the area of the phenomenon under study, the construction industries are the employers of the technical college graduates, the questionnaires will be handed over to both electrical professionals in the public and private sectors, the main reason for choosing the experts is that they are the resource personnel and end-users of the technical college graduates who can furnish us with any detail needed in answering the questionnaires, relating to their understanding of the required skills and the performance of TVE graduates. The electrical installation instructors and Ministry of education officers are selected because of their professional experience in area of curriculum design and policy formulation guiding vocational education. The participators of the focus group will be organized to examine the curriculum design of vocational education and how vocational education sector can improve the curriculum design guiding the programme among others. Targeted populations for this study are in two groups, one is all the construction companies in Nigeria with professionals in electrical, and the second population is mainly the electrical installation instructors which are experts in the area of curriculum guiding the programme. A comparative study will be carried out between the study states.

Due to the educational deprivation in the north compared to the south, it was necessary for the study to cover two zones.

The locations for the study will be the Southern and Northern parts of Nigeria. Education disparity between the Southern and Northern part of Nigeria gives room for the researcher to make investigations concerning the skills gap that is prevalent and a rationale for considering multiple locations. There is however, a long standing history of educational deprivation in the northern zone compared with the southern zone and therefore it is essential for the study to cover Lagos and Ogun in the South because they have a large population of students and schools compared to other towns in the south, while Kaduna and Abuja will be visited in the northern zone having a large population of students and schools compared to other towns in the North and mainly because of the security situation report obtained from the UK

Foreign and Commonwealth office as being safe compared to other states in the northern area in other to make a comparative study. Fafunwa (2004) observed in the Nigerian history of education that the Northern Nigeria lag behind in education in comparison with the level of education acquired in the Southern part of Nigeria. This shows that there is deficiency and lack of interest in education in the North, in comparison with the south and moreover, there is no flair for education couple with very low level of enrolment in all tiers of education ranging from primary education through secondary and post education levels (Premium Times Nigeria, 2016). Hence the reason for choosing multiple locations for the research study.

4.11 Data Collection Process and Analysis

This study is based on information collected from several primary and secondary sources.

The figure 4.2 below explains the information collected from the stakeholders.

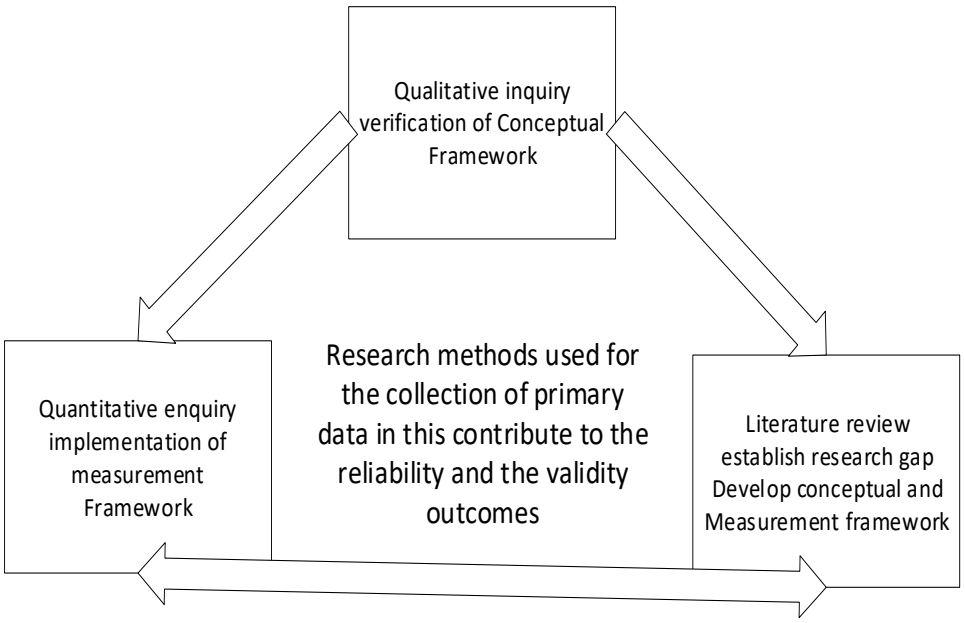

Figure 4-2: Data Collection Process

Data collection is a procedure of collecting information from all the relevant sources to find answers to the research problem, test the hypothesis and assess the outcomes. Data collection could be grouped into two classes, secondary methods of data collection and primary methods of data collection (Ajayi, 2017).

The research adopts the mixed method strategy, combining the qualitative and the quantitative enquiry. The quantitative enquiry deals with figures using survey applying questionnaire to collect information from employers and electrical contractors, while the qualitative enquiry adopt focus group interview in collecting the data.

Allow using more than one method will help to combine all the various features of the research under study.

In general, the research will use both quantitative and qualitative approach because they are both important and useful in examining the skills gap that is prevalent between technical college electrical installation graduates and the demand for them by the construction industry in Nigeria.

4.11.1 Questionnaire Design

Questionnaires were distributed out in order to collect quantitative data for the sake of exploring their points of view regarding measuring the skills gap and ultimately address the research questions. The survey in this section consists of a 5-page questionnaire with 94 questions for employers and registered electrical contractors of electrical installation practice in construction companies. The questionnaire is comprised of four parts (A, B, C and D). Section (A) includes general information about the employers: sector, years of experience, number of employees, minimum certificate required for work as a craft operative. Section (B) focuses on skills acquisition and importance of skills needed by electrical installation craft men which includes skills and competencies required in carrying out the job required as a craft man in the construction industry, and methods of skills acquisition for TVE College electrical installation graduates, this informed both the conceptual framework of the study and review of literature. Section (C) focuses on measurements of skills gap which informed the measurement framework guiding the study. It includes the list of statements regarding the abilities of TVE college electrical installation graduates, with 42 designed and constructed questions ranging from strongly disagree (1) to strongly agree (5). Section (D) focuses on the improvement of TVE college electrical installation programmes which includes statements regarding with educational institutions varying from (strongly disagree (1) to strongly agree (5) and, suggestions

for improving the quality of technical college graduates varying from (not important (1) to very important (5). All the questions from section (B to D) make use of Likert style 5-point scale ranging from not important (1) to very important (5) not at all (1) to very good (5), strongly disagree (1) to strongly agree (5) and, not important (1) to very important (5). (See appendix for employer's questionnaire). A typical questionnaire is shown in appendix A1

4.11.2 Quantitative Analysis – Descriptive and Inferential Statistics

The analyses of the data gathered through the quantitative method were carried out through statistical analyses employing descriptive and inferential statistics. To understand the category of the collected data, various descriptive statistics will be employed to include the following, measures of central tendency such as modes, means, and medians and frequency distributions and, measures of dispersion such as standard deviation will be sorted out. The analysis was conducted by using SPSS software version 24 and then be interpreted by using Excel software 2007 to formulate graphs and tables. Inferential statistics was carried outusing comparison of means by t-tests.

4.11.3 Qualitative Data Analysis (Focus Group)

The process of analysing qualitative data is demanding and involves creativity and systemic searching (Baiden, 2006). The qualitative research design was also adopted for this study. The most common method and etymology of data collection in qualitative research are the following, action research, interviews, observations and, focus group (Cresswell, 2009; Lock, Silverman, &Spirduso, 2010; Marshall & Rossman, 1999). The researcher has a framework that determines and guides the nature of the data collection. Based on this, the researcher chose focus group discussion method because it is a process that entails the utilization of extensive group interviews whose participants are chosen because they are a purposive, although not necessarily representative sampling of a particular population with this group as a focal point of the given topic. Participants in this type of research are, thus appointed on the basis that they have a significant contribution to the topic based on their wealth of experience and knowledge of the study area (Burrow & Kendall 1997). After conducting the focus group interview, the information gathered was

used to develop an audiotape or a videotape for analysis. Though there are various forms of analysing focus group interview ranging from grounded analysis, discourse analysis, narrative analysis thematic content analysis, and others.

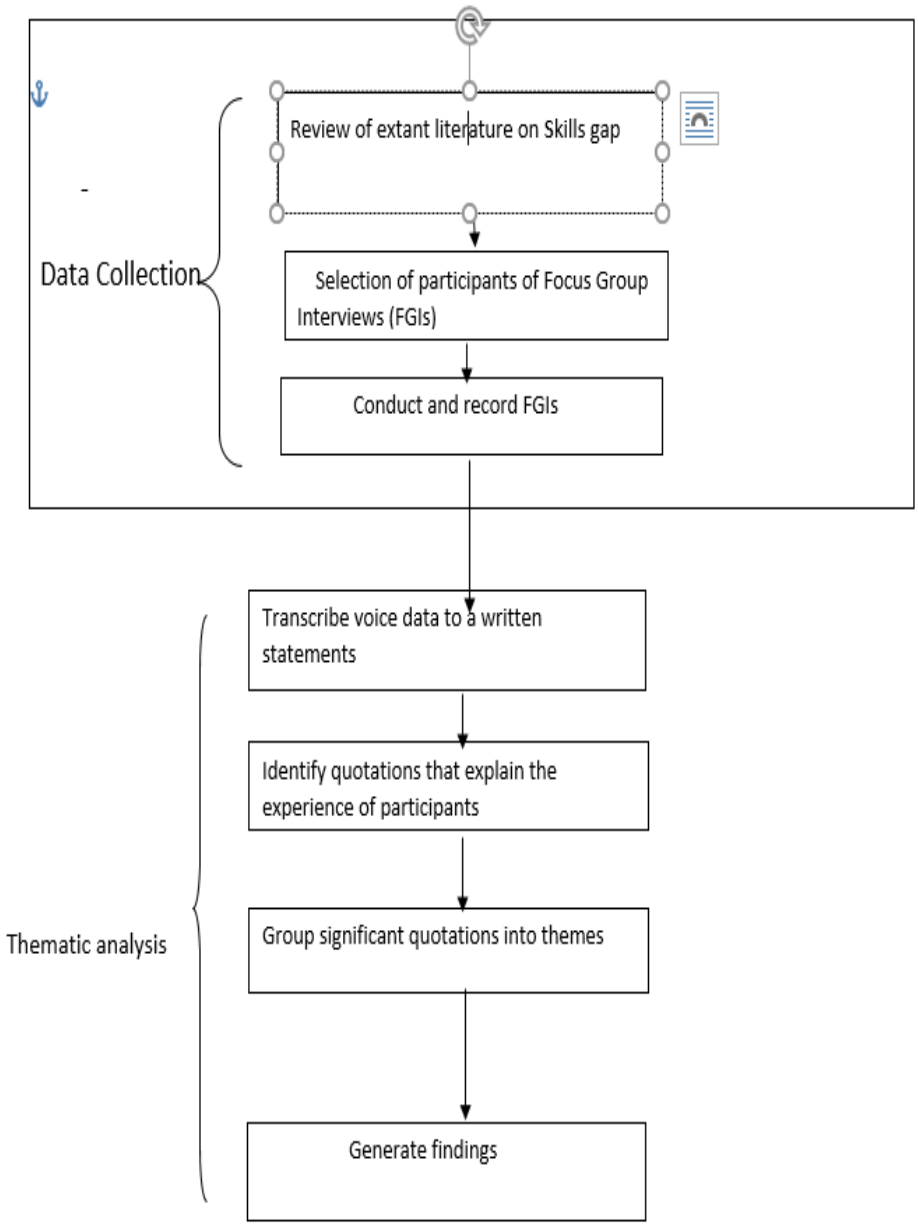

Figure 4-3: Design of Focus Group Interviews

4.11.4 Thematic Content Analysis

For this investigation, thematic content analysis was adopted, to support the analysis, Creswell's (2009) framework for qualitative data analysis wasadvantageous. The analysis followed 5 main steps as follows:

- Audio discussion transcription (i.e. verbatim transcription)
- organising and preparing the transcripts
- duplication and re-reading of the transcripts
- transcripts coding; and
- themes and sub themes generation

The discussions of the focus group were thematically analysed using the relevant coding techniques to obtain units of meaning from relevant statement and to group them into recurring themes. Within the coding scheme, four tags were used to differentiate the headings assigned to each, the first being the programme, second is the theme, third is the keywords and forth is the category. Programme cipher organisation indicates the participants' job role that gave a transcript segment whereas the theme coding shows the premises that informed a transcript segment. The classification of the theme coding involves: (i) New –indicates the beginning of a novel discussion; (ii) Response – denotes an answer to a question, (iii) Build up – reveals when contribution is made to an existing discussion; and (iv) Moderator-stipulate a control session given by the moderator.

The coding and organizing the information starts as soon as the transcript is developed, the voice data from the participants was transcribed into a written statements, where quotations that explain the experience, views and understandings of the participants were identified, this process of coding helps the researcher to identify patterns, relationships and meaning in the process. More importantly, coding reduces the quantity of information the researcher needs to analyse, by focusing only on the dialogues that are relevant to the research question and help the researcher to quickly retrieve segments of information needed.

Codes are labels that helps the researcher to analyse information collected. There are so many ways to code information. Information collected ranging from letters, words, numbers or colours. In this study a series of letters that are linked to the research topics were used.

Each of the focus group was analysed within and between groups in order to highlight the respondents' explanation and views of the research problem with the use of the research objectives as guidelines

The focus group discussions transcripts and the coding framework used to arrive at the themes are enclosed in the C-1

4.12 Sampling technique

Sample is defined as a set of subjects chosen from a larger population. Milner and Salkind [2002] suggest that the goal of sampling is to come up with one where the sampling error is minimized. In addition, sampling techniques help decrease the quantity of data required by only putting into consideration the data from a sub-group preferably than all possible cases [Saunders et al., 2000].

According to Cochran [1977], there are several sampling strategies to include random sampling, which require pinpointing all elements of a population, grouping those elements, and arbitrarily selected from the list, in this sampling strategy all element has an equal chance of inclusion. The second kind is the systematic sampling which require picking every nth case within a defined population. It is easier to do than devising methods for random selection. The stratified sampling is the third one, which involves classifying your population into several subgroups and taking a random sample within each one and ensuringthat the sample signifies key subgroups of the population. Cluster sampling being the fourth one, involve surveying whole clusters of the population. These are required to be sampled calling for individuals within the group to be surveyed or interviewed.

4.13 Sample Selection Process for the Study

For the purpose of statistical interpretation, information regarding population concerned will be achieved through sampling [Cochran, 1977]. Specifically, for the reason of this research, population guiding the research is to use all numbers of workers in the construction industry though there is no list to specify the numbers of people in the industry, even though the numbers of companies employing the graduates of technical college are of more importance considering the research investigation. A purposive sampling technique was used to select companies.

Questionnaires was given out to the companies selected for data collection. The database for the industry is not readily available on the internet, other sources visited are the Nigerian yellow pages , the Federal Ministry of commerce and industry business directory and the Corporate Affairs Commission office in Abuja revealed that we have about 200 functional registered construction companies which is the most comprehensive list available that discloses the number of registered companies. Nigeria and the case study states in Northern and Southern States of Nigeria, combined (case study states), out of which 120 was sampled. A sample of 60 companies each from the Northern and Southern part of Nigeria was drawn as per convenience to the researcher from the list obtained from the yellow pages and, the Federal Ministry of commerce and industry business directories and the Corporate Affairs Commission. These companies will be visited and if they agree to participate in the survey, three questionnaires will be handed over to the target population for this study to include registered electrical contractors (within which, are prospective respondents/participants such as technical managers, supervisors, and head of personnel instructors). The questionnaires will be collected a week later after successful completion, if not completed the researcher will go back after few days to collect the filled questionnaires. Should in case some of the companies do not agree to participate in the survey, some other companies will be visited and be convinced to participate.

The second population will be all the technical colleges from the case study states offering electrical installation in Nigeria out of which technical education colleges, (within which are prospective participants such as electrical education instructors/tutors, department/unit heads and programme/course leaders) will be invited for discussion. The skills gap that is prevalent between the Electrical installation graduates and needs of the labour market, called for the sample of all the stakeholders involved. Hence, the study focuses on Electrical installation graduate from technical college. The research will be based on purposive sampling of the target population. Professionals being one and instructors another. The reason for choosing a purposive sampling in this study is purposely to concentrate on attributes of a population that are of interest.This will allow the researcher to provide answer

to the research questions,permit more representative sampling and enhance the accuracy of estimation [Saunders et al., 2000].

Table 4-6: Populations and Sample of the Study

Sector	Case study	Population	Sample	Method
Public and Private Companies	Kaduna and Abuja States	Registered electrical Contractors, construction company managers, supervisors, Electrical HODS and Head of Personnel	60	Questionnaire
	Lagos and Ogun States		60	
Ministry of Education, Zonal Education Offices	Kaduna and Abuja States	Electrical Installation Heads of Departments and Instructors, Zonal education Officers	3 Focus Groups	Focus Group Interview/Discussion
	Lagos and Ogun States		3 Focus Groups	

4.14 Reliability and Validity Checks

During the course of carrying out investigation on qualitative study, it is very important for the investigator to establish confidence in the findings and conclusions by conducting reliability and validity investigation. Qualitative validity means that the correctness of the findings is evaluated by the researcher using specific methods and qualitative reliability checks that depicts uniformity from the researchers'

perspective (Gibbs, 2007). The same author) suggested that reliability was guaranteed through the application of the following recommendations;

- inspecting transcripts (through duplicating re-reading) to ensure that errors were not made during the transcription process; and
- ensuring the absence of drift in code meanings during the coding process

Butterfield *et al.* (2005) and Creswell (2009) suggested that qualitative validity was established through the application of the below suggestions;

- functioning directly with the unabridged transcript and showing originality of the findings in the interviewee's answers by giving sample excerpts in the respondents' actual words;
- referencing literature to buttress findings in order to show theoretical consensus which Maxwell (1992) introduced as the existence or non-existence of concurrence within the body of inquirers on the interpretative and descriptive terms used;
- originating themes by connecting the perspective of several participants;
- peer debriefing by research supervisors who assessed and questioned the whole qualitative inquiry; and
- Member checking by requesting participants to comment on the findings. This was done with the quantitative inquiry validation as a result of time constraint.

Taking cognisance of reliability and validity investigation, it is important for investigators to make use of qualitative methods with rigour in order to intensify the validity of their studies.

4.15 Focus Group and Questionnaire Findings (Pilot Testing)

Two members of electrical staff, from each technical college offering electrical installation in Ogun state were randomly selected to prevent bias and were invited

to hold a focus group discussion for pilot testing both the focus group questions and the survey questionnaire.

Six questions were initially drawn to understand the intervention needed to address the skills gap that is prevalent among the electrical installation graduates. The time allotted to discuss the questions were not enough. Some challenges emerged during the group discussion amongst which were the tape recorder failing to record properly; time management; and restructuring of the questionnaire. Experience gathered during the discussion prompted arrangement of another pilot focus group interview to try the revised questions. It was discovered during the pilot testing that, the respondents did not understand the questions raised, this prompted the researcher to rephrase and revised the questions to the level of respondents understanding, rephrasing the questions brings about understanding of the subject matter, making the respondents to give adequate response and making the time allotted to be enough. Most of the initial challenges faced during the first focus group discussion did not happen during the second group discussion.

The aim of pre-testing questionnaire is to help researcher improve validity, reliability, and sensitivity of a survey instrument prior to undertaking the actual survey. Bowden et al (2002) warn that failing to investigate the interpretation of questionnaires items may result in misinterpretation (by respondents and investigator). A pilot test was done to evaluate the precision and completeness of the questionnaire, including the feasibility of the survey. Initially both the survey questionnaire and the focus group questions were voluminous, and the time allotted in answering the questionnaire was not adequate, respondents struggle to interpret some parts of the questionnaire. In this regard some parts of the questionnaire were revised. The language was restructured, and respondents were requested to spend an additional time in filling the questionnaire. After re-testing the questionnaire on some other respondents, it was discovered that the questions were well understood. They did not struggle to interpret the questions and, the time allotted was enough to answer the survey questionnaire.

This pilot study adopts the randomized trial process and the sample is randomized. This process is kept same in the full-scale project. The result of this pilot study is

based on feasibility rather than on the statistical significance, and the main study is feasible without any changes.

The impacts of pilot studies on the final design of the research guarantees and increases the likelihood of success. Pilot studies fulfil a range of important functions, like identifying potential issues which can affect the result of the full investigation and can provide valuable insights for other research experts in the field.

Though, the length of the questionnaire were reduced because of the time frame, yet the questionnaire covered the entire questions needed to cover. Duplications in the questionnaire were firstly removed, other similar questions were rephrased to reduce the numbers of questions set, this allow the respondents to answer the questions within the time frame. The same procedure applies to pilot testing the focus group interview, where duplications in the questions set was removed, and similar questions were rephrased to mean same as in content and to conduct the interview within the time frame set for the focus group interview.

4.16 Ethical Considerations

The research understudy is susceptible to certain ethical issues, as it was earlier mentioned in the ethical form, all participators reported their written approval relative to their involvement in the study, through a signed consent letter. The aim of the participant information sheet is to re-assure participators that their involvement is voluntary, and they were free to quit from the research prior to the already set date for the focus group discussion.

Besides, the research objectives were communicated to the participants and they were re-assured that their response would be treated privately and be used solely for the purpose of this research.

Apart from the above, participants will not be abused nor harmed, both physically and psychologically during the conduction of the research. In contrast, the researcher will create and maintain a climate of comfort.

4.17 Summary of the Chapter

This section has introduced and discussed the choice of research methodology suitable for this study. A mixed method approach comprising phenomenology (operationalised via focus group interviews) for the qualitative aspect and a survey (operationalised via questionnaire) for the quantitative aspect had been utilized as the overarching research strategy guiding this study. This will give the entire direction of the research including the procedure by which the study will be executed to explain the phenomenon understudy. The next chapter (Chapter Five) show the findings of the focus group discussion (interview) among electrical installation instructors.

Chapter 5 : QUALITATIVE ANALYSIS OF FOCUS GROUP

5.1 Introduction

The focus group (FG) interviews were the first stage of data collection method observed for the study. The major use of focus group techniques in this study is to explore in depth the main issues affecting education and training in technical and vocational colleges in Nigeria. This will make it possible to explore the points of view among instructors, and educational personnel in zonal education offices. The major aim of conducting the focus group interview with the educational personnel is to create a mapping framework to address the construction skills gap through improved technical and vocational education with reference to the challenges inherent in the Nigerian Electrical installation programme. It also represents an opportunity to enrich the main areas of research interest by encouraging the participants to explore their opinions and attitudes. This will help in identifying any gaps in the curriculum as pointed out in the literature, in areas of skills and the learning environment.

5.2 Characteristics of interviewees

Six focus groups were conducted in total encompassing northern and southern regions of Nigeria. Three focus groups were held in each region comprising between 6-8 focus group participants. Each was facilitated by the student researcher and hosted at each zone at a place earlier agreed with the discussants. The number of experts from each zone/region that participated in the focus group discussions vary and it is tabulated in the table 5.1. Participants were asked to identify and discuss the specific issues and constraints affecting the programme curriculum guiding electrical installation programme in their respective regions. All of those that were invited showed willingness to participate in the interview. Majority of those that were invited possess university degree in Industrial Technical Education with options in Electrical Installation, Electrical Engineering with City and Guilds of London Certificate. The average years of experience in the job by the participants is estimated at 15years.

5.3 Overview of the focus group discussions and the participants

Table 5.1:

Table 5-1: Overview of Focus Group Discussions and Participants

Focus group ID	Focus Group Location	Zone	No of experts	Years of experience	Duration in minutes
1	Ijebu-Ode	South	8	8 - 27	93
2	Ilara- Remo	South	6	5 - 30	90
3	Abeokuta	South	7	5 - 30	89
4	Melali	North	7	5 - 25	94
5	Kajuru	North	6	5 - 27	90
6	Soba	North	6	0 - 15	82
			40		

5.4 Organisation of data

The focus group questions were prepared according to the themes that had emerged from the literature review. The focus groups focused on the following three issues:

Curriculum and curriculum guiding electrical installation programme.

Electrical installation skills.

Graduates electrical installation skills and the needs of the job market.

The analysis of the focus group discussions was thematically examined. Programme coding scheme was applied to distinguish units of meaning from notable expression of views and to arrange them into recurring themes. The full details of transcription and method of analysis have been explained in section 4.11.5, of this study.

Sub themes that emerged from the thematic analysis of the interview transcripts are as follows (Figure 5.1):

Definition of Curriculum

Teaching of skills in electrical installation programme

Curriculum design

Suitability of electrical installation programme curriculum in satisfying skills demand of the industry

Teaching the content of the curriculum guiding electrical installation

Improving the curriculum guiding the programme

These corresponds to the interview themes, and all sub themes were easily mapped unto a relevant theme.

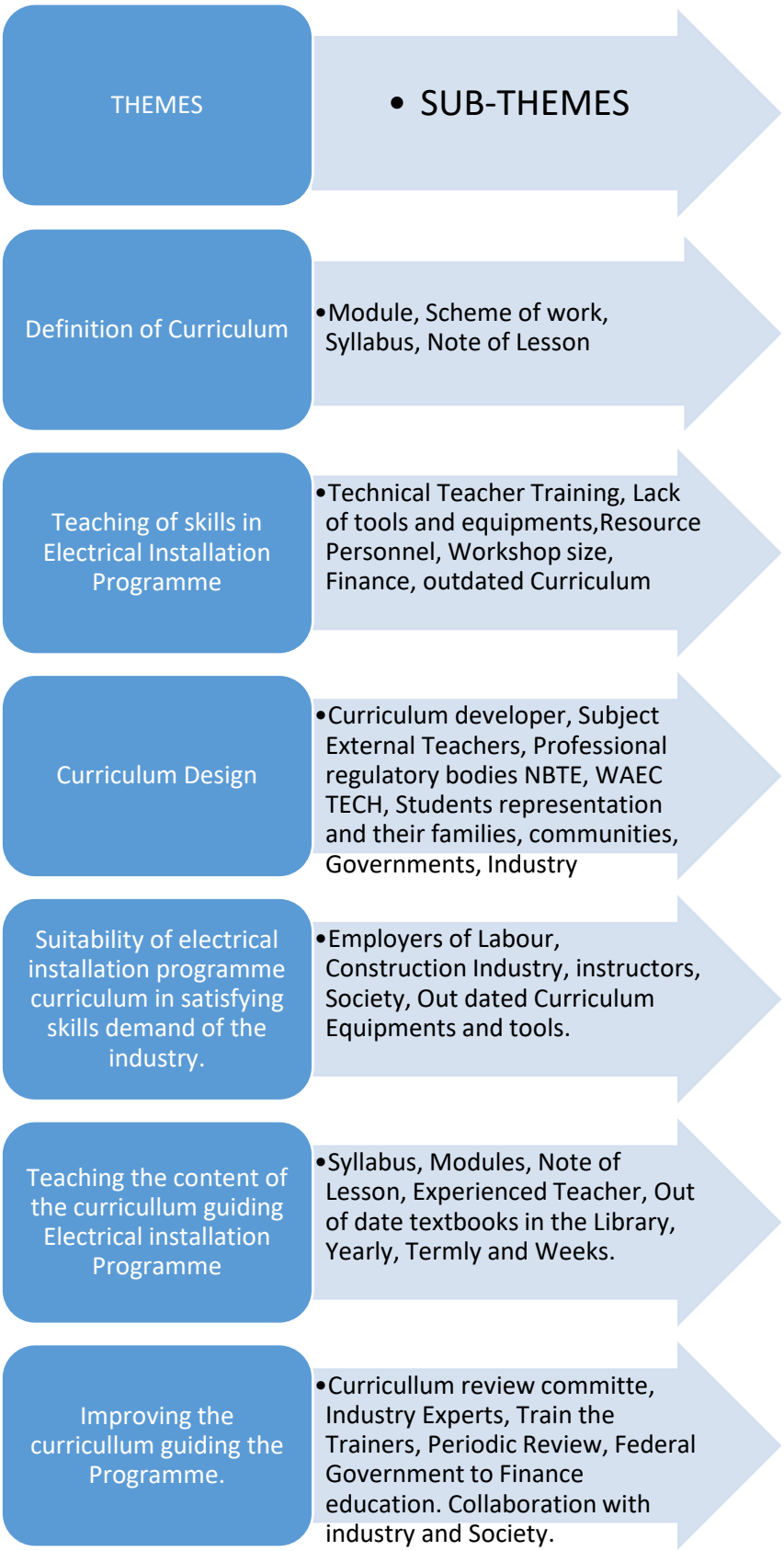

Figure 5-1: Thematic Analysis of Qualitative Data: Focus Group

5.5 Definition of Curriculum

In order to gain the electrical installation instructors' awareness of curriculum guiding electrical installation programme, the groups present were asked for their views, perception and definition of curriculum.

As ''Curriculum'' is not a new term in education, the electrical installation instructors, in electrical installation trade present were asked about their perception and the definition of curriculum. All the respondents believed and agreed that curriculum is a major document containing all that is supposed to be taught during a session and which brings about the components of each course to be taught in a programme.

Most of the respondents stated that curriculum is the most important document for training students so that graduates of technical college could be readily trained and fit for the labour market. Some of them indicated that graduates' readiness for the labour market depends on the curriculum and the training offered.

The researcher asked the participants to define curriculum. This was intended to illustrate their understanding so that they could participate clearly. The Electrical installation instructors showed an understanding of the term "curriculum". Some of the participants define curriculum as:

''The totality of planned experiences needed for training a program of study. The curriculum must therefore be implemented in the school plan system to be carried out during the course of study.'' (FG 1 participant)

Another electrical installation instructor defined "Curriculum" as:

> *''A guide for the teacher to follow in disseminating the topics to be treated during the course of the programme.'' (FG 3 participant)*

> Another electrical installation instructor defined "curriculum" as:
> *''A set of learning experiences to cover topics set for a programme during the coverage of the programme either termly, yearly or semester.''*

Another respondent indicated that technical college graduate's readiness for the labour market depends on the curriculum set for their programme of study. *''Therefore, the term* curriculum *refers to the lessons and academic content taught in a school or in a specific course or program for a period. In the school system* curriculum *is often defined as the courses offered by a school, but it is rarely used in such a general sense in schools''.*

Then, the respondents were asked about the purpose of the curriculum to a program of study. From the focus group interview, various views were gathered concerning the purpose of curriculum and some sub-themes emerged during the discussion to include: Issue of modules, scheme of work, syllabus and note of lesson. There was a broad consensus among the electrical installation education officers regarding the definition of curriculum and the use of the educational documents. The experience gathered in the course of training their students gave the electrical installation instructors an understanding of the documents used in training such as scheme of work, register, lesson notes as a trained technical instructor from various teacher training centres. It was noted during the discussion that both Northern and Southern part were using the same Curriculum set by the National Business and Technical Examinations Board (NABTEB) to guide the electrical installation students during the course of their programme. The curriculum was set in accordance with the National Policy on Education to cover the stated objectives. It was from the objectives that the discussion about the subthemes emerged.

This was how one of the electrical installation instructors of one of the technical colleges in the Northern zone reacted to the discussion of the subthemes:

The module, scheme of work and syllabus are all fragments of the curriculum. They are all portions extracted from the curriculum, breaking it down into sub-heading/topics into the number of weeks to be taught. The only difference from the sub themes is the note of lesson, which is prepared weekly or fortnightly to cover part of the scheme of work to teach during a term/session.

However, an instructor from the Southern Zone, Ogun State differentiate the module from scheme of work even though they are interrelated and interwoven he explained that module is a fractional part of a curriculum. He stated, however, that the objectives of a module are not as comprehensive as that of the curriculum and the level of competence achieved is minimal in module, compared to what is achieved in curriculum.

Another electrical installation instructor from the northern zone, slightly differentiate the terms and said that ''scheme of work, is the guideline that defines the structure of content of an academic course while syllabus stand for all subjects as well as topics to be covered during the course of training and that curriculum contains all the chapters and content to be taught in school which combines the affective, cognitive and psychomotor domains''.

A chief technical instructor contributed and said ''syllabus is the educational document that contain all the concept about a particular subject to be taught, while curriculum is the totality of content taught in the course''.

An instructor from a technical college in the northern zone differentiate between syllabus and curriculum. He said ''syllabus is a subject while curriculum is a course, syllabus is set by the exam body and that the curriculum is being set by the government or a body designated to set the curriculum''. He stressed that they are all related concepts. The words are being used interchangeably.

Finally, the last instructor contributed and said that ''syllabus is an outline of list of topics students are supposed to study in a given year or specified period of learning'', in case of technical colleges in Nigeria, it is set for 3years for the time spent and specified for training.'' (FG 6 participant).

In summary it was deduced that all the participants, instructors, and heads of department of electrical installation have the knowledge and understanding

of definition of curriculum, what it entails and the importance of curriculum to the programme of study since it is a national programme.

5.6 Teaching technical, communication, literacy and problem-solving skills in electrical installation Programme

The researcher asked the electrical installation instructors to discuss how they teach technical, communication, literacy and problem-solving skills found lacking among the technical college graduates. Participants recognised these skills and felt that they were already embedded in the curriculum.

A chief instructor in electrical installation programme contributes and states that:

''*The curriculum for technical education has been designed in such a way that before you can be called a qualified electrical installation graduate, you must have gone through general studies and your trade specialisation, so under general studies we have subjects like physics, mathematics, English, Chemistry and host of some other subjects in which all the skills mentioned by the researcher were embedded into, for the benefit of impacting the skills to the students."*(*FG 1 Participant)*

However, the participants dwelt more on the number of challenges they faced in delivering the stated curriculum.

The first is related to teaching skills and training. On this issue, one of the electrical installation instructors said that,

''Before a teacher can teach all the skills mentioned, he or she should have *undergone training in education, some of us, instructors do not have a requisite qualification in education, to impact this skills becomes a problem because of lack of post graduate diploma in education, or at least a degree in education is necessary to make us qualify as a trained teacher. My advice is for the teachers to go for teachers training in education'' (FG 1 participant)*

However, teaching resources were also identified as inadequate, as an electrical instructor noted:

''Though we have discussed the issue of curriculum, scheme of work, syllabus and the rest educational documents. It must be noted that all the skills are already being embedded in the courses, skills are not to be taught in isolation, but the major problem identified from my own perception is that materials to be used for teaching this skill are not readily available both from the government, industry and the students. The issue of improvisation on the part of the technical instructors is not there, so that is the more reason why students show deficiencies in skills mentioned. These skills are found wanting in our graduates.'' (FG 4 Participant)

This resource extended to the number of instructors and therefore the size of classes. As stated by an electrical installation instructor from southern zone of Nigeria states:

''Skills are not courses; they are fractional part of a course. As my colleague have rightly said all the skills mentioned by the researcher had already been embedded in the courses. We have communication skills in English, technical skills are in Workshop practice, literacy and problem-solving skills in mathematics etc. so that is how we disseminate the skills to the students, though verbally when there is no provision for materials for teaching. The size of the workshop provided for training is not adequate for the large numbers of students admitted for the program.'' (FG 5 participant)

And further a senior education officer (electrical installation) states that:

''There are two major problems with the issue of teaching all the skills you mentioned, even the skills you did not mention. The major challenges are in the area of resource personnel and materials for teaching the skills. We do not have enough, adequate and qualified staff in area of electrical installation to teach the program, there are round pegs in a square hole and, the worst of it all is that materials and equipment's for teaching the skills are obsolete and, in most cases, not available.'' (FG 1 participant)

An instructor from in the Northern zone said, ''*truly we have to teach skills to our students, it is only in area of electrical practice that the teaching of skills is vivid because this is a practical class in which the students will carry out their practical on the cubicle or the wiring board, this is the only time we can teach electrical installation skills to our students, but in some areas like brazing of conductors, installation of underground cables, maintenance of machines and repairs of machine, there are no tools, equipment's and facilities for teaching this aspect that is very necessary for industry use.'' (FG 5 Participant)*

These challenges were seen to severely impact on the training of graduates. As one contributor put it,

''*if we are not going to deceive ourselves, we are not imparting much practice in to our students, mainly because the ministry of education, local, the state, and even the federal government are not contributing enough in terms of finance to the training of vocational technical education in general, in Nigeria.'' (FG 2 Participant).*

Conclusively, the participants agreed in their views that there are two major challenges that emerged with the issue of teaching the skills listed, these are in the area of resource personnel having non-teaching experience and non-availability of materials/tools for teaching the skills identified.

5.7 Designing of Electrical Installation Curriculum

The electrical installation instructors, electrical installation education officers in electrical installation trade were asked to discuss how they design the curriculum guiding the electrical installation programme.

Many of the electrical installation instructors claimed innocence, that they know nothing about how curriculum guiding their programme is designed, though, they agreed that it was designed by two major bodies in Nigeria National Business and Technical Examinations Board (NABTEB) and West African Examination Council (Technical).

Most of the respondents claimed that their duty is to train the students with the available curriculum provided as this will make them be readily available to enter the labour market if well-structured and disseminated. One educator stated thus:

''I have gotten fifteen years' experience in electrical installation practice, I do not know anything about the designing of the curriculum guiding this programme. All we do is the breaking down of the curriculum into Syllabus, scheme of work and module for implementation. We have never been invited into designing of the curriculum even though, we the teachers that are supposed to be invited based on our experience were not invited.'' (FG 1 participant)

This distance from curriculum design was perceived by some to be detrimental. Another electrical installation Instructor from (FG 5 *participant*), stated that:

''In designing a curriculum, so many things must be put into consideration, to include a team of experts in the field concerned, content, learner's character, methods of teaching, objectives, evaluation and some other things. All these are left out. The body assigned for the designing the curriculum were picked from outside the teachers and instructors teaching the programme.''

As other participants mentioned, this led to overdue focus on the required skills with some regard of the entry level of the students to TVE programmes.

''The designing of any program of study in vocational technical education (VTE) is done by the body assigned by the Federal Government, which are the NABTEB and WAEC (TECHNICAL). These bodies will now invite expert from different institutions like universities and polytechnics who know nothing or less about these students, purposely because they are professors and engineers, they will just design what they deem fit for this student, whom they do not know their educational background''.

Another electrical installation instructor from (FG 3 *participants*), stated that:

''The body in charge of curriculum design/development did not consider the entry requirements of the students in to consideration before drawing up the curriculum, the entry qualification for entry into technical colleges is junior secondary school certificate which is not adequate for the standard of exam set for the students, and moreover the level of assimilation for this students is low. The public, industry even the students that are supposed to be invited were not consulted. All we received is the curriculum, we do the breakdown, and teach the students, and about designing we were not involved at all''.

Another electrical installation instructor from (FG 1 *participants*) states that:
''Most times, it has been detected that the curriculum we have been using for students are faulty in the sense that, it is too advanced for the type of students we are training and not even in conformity with the employers need. This needs to be reviewed periodically to meet the need of the society. The two major stakeholders responsible for the graduate's skills development were not contacted which are the teachers and the employers of labour.''

There was a consistent viewpoint, that the involvement of senior academics led to unrealistic expectations on the TVE educators. Another electrical installation instructor stated that:

''Though it is our duty to produce technical college graduates with basic knowledge in their area of specialisation, it is the duty of the body assigned to

draw the curriculum to invite specialist, subject teachers, industry and the public who are the end users of the curriculum to sanction their opinion before drawing the curriculum. Instead they invite professors and those that are not relevant to VTE to come and design the curriculum. That is why the curriculum is not effective coupled with government not financing VTE.'' (FG 2 participant)

Another electrical installation education officer mentioned:

''Generally speaking, it is the responsibility of the college to disseminate knowledge. At the same time the workplace or the construction industry should also take their own responsibility in preparing their workers with the skills required of them to boost their production. The college should not be blamed for every misconduct of our graduates.

The industry should equally participate in drawing the curriculum.'' (FG 5 participant)

In summary the instructors in general felt that they were excluded from the design of the curriculum and as a result the curriculum had many deficiencies from their point of view. Wider participation was called for including the imperative for industry to participate in the curriculum designing. This was coupled with the need to recognise prior attainment in designing the curriculum and the Federal government of Nigeria not financing VTE adequately.

5.8 Curriculum satisfying skills demand of industry

As noted above, educators believed that the body set up by the Federal government should involve the employers of labour, the construction industry, instructors and the society to the design of the curriculum as it will improve the curriculum by incorporating their needs, developing work placement training, and promoting job opportunities.

There was recognition that the current curriculum covered a lot of the required skills. One of the electrical installation instructors stated that*: ''to some extent I will say that the curriculum is satisfying the skills demand of the industry, because all the electrical skills needed by the craft men were included in the curriculum.'' (FG 1 participant)*

There was further emphasis that this did not extend to the resources needed to deliver the curriculum adequately.

Another electrical installation instructor commented thus: ''that what is the benefit of a curriculum that incorporates all the skills demanded by the industry, and there are no equipment's, tools and equipment to teach or disseminate the appropriate teaching to the student. It amounts to not satisfying the skills demand of the industry.'' (FG 3 participant)

Other instructors were concerned that the skills required were not keeping up with changes in the industry.One of the electrical installation instructors suggested that*: ''in my own opinion, I will say the curriculum has all that is required in terms of skills needed. My question is that are the skills teachable? Are the skills relevant to industry need? Is the curriculum not outdated? All the answers to these questions are what's needed to be deliberated upon.'' (FG 5 participant)*

A class teacher in electrical installation said affirmatively that*: ''the curriculum is out of date and needs to be reviewed before it can satisfy the skills demand of the industry.'' (FG 5 participant)*

Some of the electrical installation instructors are of the opposing views that the curriculum is not the main problem, though it has not been reviewed for a long time, but the issue of skill remains same, what is of importance are the materials, equipment's, facilities for teaching skills in the colleges.

Another electrical installation instructor from (FG 5 *participants*) said that: *''skill is skill whether in the current curriculum or the out of date curriculum. What is of paramount important is that do we have what is needed in teaching the skills? Which is capital no.''*

In summary there are contrary opinions concerning the curriculum if its satisfying skills demand of industry. Majority of the participants believe that irrespective of the curriculum being out of date, it still accommodate the skills demanded by the industry while, participants with the opposing view claimed that the curriculum satisfy the industry demand to an extent though out of date, but all stakeholders should be involved in other for the curriculum to satisfy the skills demand by the industry. Another view stressed that the important thing is to provide materials, equipment and facilities for teaching skills in colleges whether or notthe curriculum is out of date.

5.9 Teaching the curriculum guiding electrical installation programme

In teaching the curriculum guiding electrical installation programme, the opinion of the instructors is very similar in most cases, both from the Northern and the Southern Zone of Nigeria. One of the major challenges that affects the teaching of the curriculum guiding the study as noted by the instructors is the failure on the part of the government to supply the schools with current equipment's, facilities and textbooks that are relevant to the programme understudy. This corresponds with what has already been pointed out in the literature review, this is confirming that these facilities are not available for teaching the programme.

An electrical installation instructor (FG 2 *participant*) in the southern part of Nigeria said: ''*The curriculum is presented to us, all we do is to break it down into syllabus, modules and note of lesson, and see how teaching will take place.''*

Another electrical installation instructor said that*, ''the curriculum has been broken down to three years already, it is the duty of teachers to further break it down to number of weeks in a term, and mostly we have 13weeks to make a term, so the topics were divided accordingly and make provision for revision and examination period. These are further break down into syllabus, modules and note of lessons, which are supervised by the head of department.*

Another electrical installation instructor (FG 2 *participant*) stated that*: ''An instructor can use his discretion in how to teach the curriculum guiding his program, personally I can choose to rearrange the curriculum as explained by my colleagues into syllabus, modules and note of lesson, but my point is that I will start from the known to unknown, this will simplify the mode of teaching and at same time aid the understanding of the student.''*

An electrical installation instructor (FG 6 *participant*) stated that: ''*In covering the whole curriculum for teaching, the instructor should possess the teaching experience, teaching qualifications and understanding of the curriculum, in order to know how to break the curriculum in to simpler forms for students understanding.''*

In summary, it is evident that the participants have knowledge and experiencein teaching the curriculum guiding the programme in a way that is suitable for the enrolled students despite the participants that responded negatively that the federal government of Nigeria should supply the school's current equipment's, facilities and textbooks relevant to the programme.

Participants believed that within these acknowledged constraints the instructors design modules and structures that support learning.

5.10 Ways of improving the curriculum

The educators, instructors teaching the programme suggested ways of improving the curriculum guiding the programme in areas of technical, communication, literacy and problem-solving skills. The curriculum guiding the programme could be improved by bringing the experts in electrical installation together, who possessed the wealth of experience in the field of electrical installation to deliberate on the way forward on how the curriculum will be improved upon. The curriculum could be improved by organizing a workshop comprising the experts in electrical installation and the stakeholders who are from industry to deliberate on the needs of the industry so that it could be affected in the curriculum. The curriculum should be reviewed periodically to effect changes as required by the stakeholders and industry at large.

An electrical installation instructor (FG 6 *participant*) said*: ''This is relevant to improving the curriculum as a whole, in improving the curriculum, curriculum experts from electrical installation programme should be invited to a workshop, with other curriculum experts to see where there are deficiencies and make recommendations as expected''.*

Another electrical installation instructor (FG 2 *participant*) said*: ''Curriculum should be reviewed periodically, probably for the maximum of 5years interval''.*

Another electrical instructor (FG 2 participant) said: ''All curriculum experts including the labour market, society, industries and the subject teachers should come together and look into the needs of the society and make

changes periodically within 3years such that there could be changes in the performance of their graduates.''

The principal electrical installation instructor (FG 2 participant) suggested that in improving the curriculum in areas mentioned by the researcher, ''the educational content that need improvement should be prepared in a simple method to achieve the educational outcomes''.

In summary all the participants agreed that there should be curriculum improvement. The instructors suggested that experts in the field should be invited and look critically into the curriculum to identify and rectify where there are lapses. These experts should include the instructors charged with delivering the programme. They all agreed that the curriculum should be reviewed periodically.

5.11 Summary of the Chapter

In this chapter, qualitative data of the focus group were presented according to the themes and sub themes that have emerge from it. The focus group were useful for gathering different perceptions of the research topic from the educators. It has revealed useful ideas and recommendations for the improvement of curriculum guiding the students, barriers to collaboration, electrical installation training, electrical installation skills, and electrical installation practised. The educators made recommendations and suggestions regarding the improvement of electrical installation skills and learning.

The main findings of the focus group data analysis suggested that the participants had an understanding of the curriculum. All the participants confirmed that their students were practising electrical installation skills though showing some gaps in the area of electrical practice. The educators pointed out weakness in the student electrical installation skills due to failure to provide the materials and equipment needed for practice as pointed out in the literature.

Moreover, the educators were of the opinion that the students should be trained with the latest technology and tools to prepare them for their professional life but the ones available are out of date thereby making the students not to be relevant to the job market. The participants suggested that the government should involve the educators in electrical installation curriculum development and, that the electrical installation curriculum needs to be updated periodically by adding new courses and adding the employers need to the curriculum.

In addition, the educators identified the skills considered essential to work as electrical graduates both in the public sector and with the employers to include communication skill, verbal skills, technical skills, ability to interpret drawings, customer service skills and host of other skills deemed fit for the labour market.

The participants suggested having collaboration in curriculum development and design with the employers of labour so that the curriculum and training given to the students will be relevant to the need of the labour market and to make the graduates to be self-reliant.

However, deficiencies and factors were found that negatively affect the student's electrical installation skills improvement. These include, lack of adequate workshop for training, out of date textbooks, lack of equipment's and materials for training, no curriculum evaluation and inadequate budget for training.

Finally, the participants recommended some changes and suggested ways to improve the student's electrical installation skills, changing the entry requirements of the programme and having a curriculum review and evaluation committee which will investigate the issue of curriculum to see that, it is periodically reviewed. The recruitment of resource personnel in area of electrical installation should be addressed as it stands to be a contributory factor to the skills gap that is prevalent.

Instructors that have wealth of experience on the job, should be invited in the curriculum design of the programme such that the curriculum will be able to accommodate the needs of the industry and the stakeholders. Generally, the curriculum guiding the programme should be reviewed and improved upon to satisfy

the demand of the industry at large. The next chapter of the thesis presents a discussion of the quantitative analysis of the questionnaire.

Chapter 6 : QUANTITATIVE ANALYSIS OF THE QUESTIONNAIRE

6.1 Introduction

Data generated for the purpose of this study were in two parts the qualitative where focused group was interviewed and, the quantitative where data was collected using self–administered questionnaires. The questionnaire was administered to construction industry experts which include electrical engineers, electrical supervisors, registered electrical contractors and head of personnel that are the employers of graduates from technical colleges in northern and southern Nigeria. The major aim of conducting the self- administered questionnaire with the stakeholders was to explore their points of view regarding the skills gap and ultimately address the research question number one, which seeks to identify essential skills that are in demand by the industry, and methods adopted in measuring the skills gap. Second, is to investigate objective two which seeks to develop a framework for the measurement of skills gap in industry and, ultimately assess the level of competence of graduates of technical college in areas of electrical practice and the qualities of these set of graduates as well as the nature of the relationship with the construction industry.

A quantitative analysis using descriptive and inferential statistics will be utilized to determine participant's perception for this research. This study analysis is based on responses to a 5-page questionnaire comprising four sections with 94 questions for employers and registered electrical contractors of electrical installation practice in construction companies.

6.2 Sample Coherence

The literature review suggested that the northern part of Nigeria lags the southern part educationally (Fafunwa, 2004). Therefore, the study chose to sample in both regions in order to assess the differences in skills gap and curriculum design across both regions. However, data analysis via comparison of means by t tests, showed that there was no significant difference from the questionnaire result analysed both from the northern and southern zone, (see Appendix-A1). This implies that there is no difference in the perceived skills gap between the level of education acquired by

the craft workers and the industry expectation. Therefore, the data from north and south were combined and analysed as a whole.

The results are presented under the following headings

6.3 Demographic information

6.4 Skills acquisition and perceived importance of generic skills needed by electrical installation craft men.

6.5 Specific skills and abilities of employees and measurement of skills gap.

6.6 Suggestions for improvement of skills development or electrical installation programme.

6.3 Demographic information

In this study, the demographic information provides general information on participants involved in the study and the companies they work for. Descriptive statistics were utilised to summarize participant's information. The demographic information does not focus on specific questions but provides general information about the employers in the construction industry. Such information includes job role; years of experience; qualification in the current role; number of employees working in the organisation; the recruitment profile of the organisation. The demographic information was collected to know about the quality and credibility of respondents against the pre-selected criteria. It is also about the context that shapes their perception of graduates and their expectations.

6.3.1 Variable by geographic location

Table 5.1 summarizes the demographic variable of the geographic locations of the participants. A total of 120 construction companies were visited in Nigeria, 60 companies each from northern and southern part of Nigeria. Out of all the employees of the companies, a sample of 360 was identified as potential participants for the study (3 per company), of which 180 sample is from north and south respectively. Questionnaires were returned by 118 respondents from the northern zone and 143

respondents from the southern zone of Nigeria, totalling 261 respondents. Therefore, the response rates were higher in the south than in the north.

Table 6-1: Number of respondents according to their locations

Location	Companies	No of Questionnaire	No of Respondents	Response Rate	Percentage of responses
North	60	180	118	65.5	45.2
South	60	180	143	79.4	54.8
Total	120	360	261	72.5	100

The resulting data set, which as mentioned was analysed as a single population sample, had slightly more respondents from the south (i.e. 54.8%) than from the north (i.e. 45.2%).

6.3.2 The job role of respondents

The job role identified during the course of the survey in construction companies include the following positions listed in the table. The table shows that the respondents are mostly electrical installation supervisors constituting 98.5% of the total sample. Very few are managing directors (N=3; 1.1%) and human resource manager (N=1; 0.4%).

Table 6-2: Job role respondents

Role

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MD	3	1.1	1.1	1.1
	HR Manager	1	.4	.4	1.5
	Elect Install Supervisor	257	98.5	98.5	100.0
	Total	261	100.0	100.0	

6.3.3 Work experience in electrical installation in the construction industry

Table 6.3 below shows that 70.2% of the respondents have between 0-10 years' work experience in electrical installation, while less than 30% are distributed across levels of 11years' experience and above. The results show that a majority of the respondents have over 5years' experience.

Table 6-3: Work experience in electrical installation

Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5yrs	50	19.2	19.2	19.2
	6-10	133	51.0	51.0	70.1
	11-15	2	.8	.8	70.9
	16-20	36	13.8	13.8	84.7
	21-25	1	.4	.4	85.1
	over 25	39	14.9	14.9	100.0
	Total	261	100.0	100.0	

6.3.4 Qualifications for current role

Table 6.4 reveals that 33% of the respondents hold the trade test certificate, the lowest certificate for entrance into the profession of electrical installation while 36% of the respondents hold the college diploma. Less than 20% of the respondents hold either the City and Guilds of London intermediate certificate or the West African Examination Council Technical Certificate. With the criteria set for qualifications for current role, the analysis shows that college diploma and trade test 2/3 accumulate

higher percentage of the respondent's choice, which represents the lowest certificate for entrance into the profession of electrical installation in the industry.

In answering the survey, the managing director, human resource manager and the electrical installation supervisor with at least 5years' working experience are the most qualified personnel to answer the survey in other to give a clear picture of what it entails to employ craft men.

Table 6-4: Qualification on Current Role

Qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Trade Test 2/3	87	33.3	33.3	33.3
	C&G Intermidiate	38	14.6	14.6	47.9
	WAEC Tech	42	16.1	16.1	64.0
	College Diploma	94	36.0	36.0	100.0
	Total	261	100.0	100.0	

6.3.5 Sector of the respondent's companies

From Table 5.5 it was observed that 148 (56.7%) of the respondents are in private companies while 113 (43.3%) are in public companies.

Table 6-5: Sector of the Respondents' Companies

Company Sector

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Private	148	56.7	56.7	56.7
	Public	113	43.3	43.3	100.0
	Total	261	100.0	100.0	

The resulting data set was therefore slightly weighted to respondents in the private sector with just over half (56.7%) and just under half (43.3%) coming from the public sector.

6.3.6 Number of employees in respondents' organizations

Table 6.6 shows that most of the respondent's companies have between 11-50 employees (n=128; 49.0%), followed by those whose companies have 51-100 employees (n=77; 29.5%). Another 18% of the respondents (n=47) claimed their companies have 101-300 employees, while only 9 (3.4%) work in companies with 1-10 employees. There is no company with over 300 employees. Going through the analysis we can deduce that averagely this is representative of the industry because approximately 50% of the respondents shows that most respondents' companies have between 0-50 employees.

Table 6-6: Number of employees in respondents' organizations

Number of employees					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-10	9	3.4	3.4	3.4
	11-50	128	49	49	52.5
	51-100	77	29.5	29.5	82
	101-300	47	18	18	100
	Total	261	100	100	

6.3.7 Number of recruitments of electrical installation craft men in the last five years

Table 6.7 shows that in the last five years, between 1-20 electrical installation craft men were recruited in companies where 178 (68.2%) respondents work. For 42 (16.1%) of the respondents, their companies recruited 21-40 new staff, while for 40 (15.3%), 41-60 staff were recruited in the period in question. Only 1(0.4%) of the respondents has their company employing over 60 staff. This generally reflects the picture that not many new staff members were recruited in the last five years.

Table 6-7: Numbers of electrical installation craft men recruited in the last five years

Number recruited in last 5years					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	01-20	178	68.2	68.2	68.2
	21-40	42	16.1	16.1	84.3
	41-60	40	15.3	15.3	99.6
	Over 60	1	0.4	0.4	100
	Total	261	100	100	

6.3.8 Cross-tabulation to show number of recruitments of electrical installation craft men in the last five years

Table 6.8 shows that cross-tabulation performed to indicate the number of electrical installation craft men recruited in the last five years and by number of employees. A total number of 178 employees recruited between 1-20 craftsmen, while a total number of 42 employees recruited between 21-40, 40 employees recruited between 41-60 craft men and 1 employee recruited over 60 cra ft men. As expected, the smallest firms needed to recruit fewer craft men than larger ones in general. However, the largest firms have recruited surprisingly few over 5years.

Table 6-8: Cross-tabulation showing number of recruitments of electrical installation craft men in the last five years

Number recruited in last 5years * Nigerian Specie Cross tabulation				
Count				
		Nigerian Specie		Total
		North Specie	South specie	
Number recruited in last 5years	01-20	79	99	178
	21-40	19	23	42
	41-60	20	20	40
	Over 60	0	1	1
Total		118	143	261

6.3.9 Number of recruits who are fresh graduates of TVE Colleges

Companies of the majority of the respondents (n=135; 51.7%) recruited 1-10 fresh graduates of TVE Colleges. Another sizeable proportion (n=83; 31.8%) have their companies recruiting 21-30 fresh graduates. These two categories of respondents already accounted for 83.5% of the total number of respondents, hence, the recruitments are not in favour of a large number of fresh graduates.

Table 6-9: Number of recruits who are fresh graduates of TVE colleges

Number recruited from TVE Colleges					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	01-10	135	51.7	51.7	51.7
	11-20	83	31.8	31.8	83.5
	21-30	2	0.8	0.8	84.3
	31-40	41	15.7	15.7	100
	Total	261	100	100	

Table 6-10: Number recruited from TVE Colleges* Number of employees' Cross tabulation

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Number recruited from TVE Colleges * Number of employees	261	100.0%	0	0.0%	261	100.0%

Number recruited from TVE Colleges * Number of employees' Cross tabulation						
Count						
		Number of employees				Total
		0-10	11-50	51-100	101-300	
Number recruited from TVE Colleges	01-10	6	85	0	44	135
	11-20	1	4	77	1	83
	21-30	0	2	0	0	2
	31-40	2	37	0	2	41
Total		9	128	77	47	261

6.3.10 Minimum certificate required for work as craft operative in the companies

Table 6.11 shows that 135 employees with 51.7% have trade test 2/3, while 2 employees have West African Examination Council (WAEC) tech certificate with 0.8%, 85 employees have college diploma with32.6% and 39 employees have other certificates with 14.9%.This implies that most of the respondents chose trade test 2/3 with 51.7% as the minimum certificate required for work as a craft operative.

Trade test certificate is always awarded to the informal sector trainees, it is equally awardedto the apprenticeship cadre and the technical college graduates even though it is easier for the technical college graduates to obtainbecause of the formal training they have undergone.

Table 6-11: Minimum certificate required for work as craft operative in the companies

Qualification Required for Employment					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Trade test 2/3	135	51.7	51.7	51.7
	Waec Tech	2	0.8	0.8	52.5
	College Diploma	85	32.6	32.6	85.1
	Other Certificates	39	14.9	14.9	100
	Total	261	100	100	

6.4 Skills acquisition and perceived importance of generic skills needed by electrical installation craft men

Electrical installation craft men must possess some skills that should make them employable and be relevant to industry need. The skill acquisition which is the process of obtaining necessary knowledge and ability in order to function in a particular occupation is acquired through the formal setting. Skills found in the curricula to be relevant to industry need were included in the questionnaire which was administered among the employers to see skills possessed by the graduates and the degree of importance of these skills to the industry.

6.4.1 Ratings of importance of skills needed by electrical installation craft men

Table 6.12 and Figure 11.4 reveal that the respondents rated three of the skills as '5-Very Important. These are: 1. Problem-solving ability (mean=4.79; SD=.92) 2. Job readiness (mean=4.58; SD=.71) and 3. Technical Skills. All other skills were rated with 4 'Important' and they include reading ability (mean=4.45; SD=.56) time management skills (mean=4.36; SD=.92), thinking skills (mean=4.31; SD=.53) and interpersonal skills (mean=4.14; SD=.59). The remaining skills rated as 'important' (mean approximately 4) by the respondents are: written communication skills, core skills for learning, negotiation skills, comprehension ability, leadership skills as well as speaking and listening skills (mean averages between 3.69 and 3.97). By these results, all the skills were rated as being at least important by the respondents. However, job specific skills were rated more highly than cognitive skills and management skills.

Table 6-12: One Sample Statistics

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Thinking ability	261	4.3103	0.533	0.03299
Comprehension ability	261	3.8084	0.44037	0.02726
Reading skills	261	4.4483	0.56348	0.03488
Written communication skills	261	3.9693	0.63777	0.03948
Speaking and listening skills	261	3.6782	0.762	0.04717

Leadership skills	261	3.6897	0.51836	0.03209
Negotiation skills	261	3.8391	0.67722	0.04192
Time management skills	261	4.3602	0.92434	0.05722
Problem solving ability	261	4.7586	0.61953	0.03835
Interpersonal skills	261	4.1379	0.59172	0.03663
Core skills for learning	261	3.9579	0.9126	0.05649
Technical skills	261	4.5824	0.67789	0.04196
Job readiness skills	261	4.5824	0.70569	0.04368

Table 6-13: One Sample Test

One-Sample Test						
	Test Value = 3.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Thinking ability	24.562	260	0	0.81034	0.7454	0.8753
Comprehension ability	11.315	260	0	0.30843	0.2548	0.3621
Reading skills	27.188	260	0	0.94828	0.8796	1.017
Written communication skills	11.889	260	0	0.46935	0.3916	0.5471
Speaking and listening skills	3.777	260	0	0.17816	0.0853	0.271
Leadership skills	5.911	260	0	0.18966	0.1265	0.2528
Negotiation skills	8.089	260	0	0.33908	0.2565	0.4216
Time management skills	15.034	260	0	0.86015	0.7475	0.9728
Problem solving ability	32.821	260	0	1.25862	1.1831	1.3341
Interpersonal skills	17.417	260	0	0.63793	0.5658	0.7101
Core skills for learning	8.105	260	0	0.45785	0.3466	0.5691
Technical skills	25.795	260	0	1.08238	0.9998	1.165
Job readiness skills	24.779	260	0	1.08238	0.9964	1.1684

Result on the ratings of importance of skills needed by electrical installation craft men are shown in table 6.13, the respondents are of the view that all the skills listed were important. From the respondents rating, the topmost important skills includereading; technical; job readiness and comprehension. The following were, however, still considered important: reading; time management; thinking, interpersonal skills, written communication, core, negotiation, leadership as well as speaking and listening skills. The result of a one-sample t-test are shown in Table 6.13. In this research the one sample t-test was carried out to determine whether the sample population considered a specific skill to be important or otherwise.

6.4.2 Ratings of graduate demonstration of electrical installation skills

Table 12.4 graduates were rated as 'good' (mean approximately 4) six out of the thirteen skills listed. These are job readiness (mean=3.89; SD=49), technical skills (mean=3.89; SD=.90), comprehension ability (mean=3.61; SD=.60), problem solving skills (mean=3.59; SD=.79), speaking and listening skills (mean=3.57; SD=.63) and interpersonal skills (mean=3.56; SD=.64). On the other hand, the respondents rated graduates' performance as only been 'fair' with (mean score approximately 3) in seven skills listed: leadership skills, negotiation skills, written communication skills, reading skills, time management skills, core skills for learning and thinking skills (means range from 2.97-3.49). This clearly shows that the performance of these students on the listed set of skills are just fair on the Likert scale drawn. All the skills have been rated as of high important, the seven skills listed above falls under low importance which means they are deficient in those skills, therefore creating some minor gaps.

Table 6-14: One Sample Statistics of Graduate Demonstration

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Thinking ability	261	3.4981	0.63017	0.03901
Comprehension ability	261	3.6092	0.60172	0.03725
Reading skills	261	3.1188	0.47765	0.02957
Written communication skills	261	3.1226	0.48863	0.03025
Speaking and listening skills	261	3.5747	0.62571	0.03873
Leadership skills	261	2.9732	0.69285	0.04289
Negotiation skills	261	3.1073	0.7721	0.04779

Time management skills	261	3.295	0.58271	0.03607
Problem solving ability	261	3.59	0.78724	0.04873
Interpersonal skills	261	3.5556	0.63985	0.03961
Core skills for learning	261	3.4713	0.65935	0.04081
Technical skills	261	3.8889	0.90251	0.05586
Job readiness skills	261	3.8966	0.48914	0.03028

Table 6-15: One Sample Test of Graduate Demonstration

One-Sample Test						
	Test Value = 3.5					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Thinking ability	-0.049	260	0.961	-0.00192	-0.0787	0.0749
Comprehension ability	2.932	260	0.004	0.1092	0.0359	0.1825
Reading skills	-12.894	260	0	-0.38123	-0.4394	-0.323
Written communication skills	-12.478	260	0	-0.37739	-0.437	-0.3178
Speaking and listening skills	1.929	260	0.055	0.07471	-0.0016	0.151
Leadership skills	-12.284	260	0	-0.52682	-0.6113	-0.4424
Negotiation skills	-8.217	260	0	-0.39272	-0.4868	-0.2986
Time management skills	-5.683	260	0	-0.20498	-0.276	-0.134
Problem solving ability	1.848	260	0.066	0.09004	-0.0059	0.186
Interpersonal skills	1.403	260	0.162	0.05556	-0.0224	0.1335
Core skills for learning	-0.704	260	0.482	-0.02874	-0.1091	0.0516
Technical skills	6.961	260	0	0.38889	0.2789	0.4989
Job readiness skills	13.097	260	0	0.39655	0.3369	0.4562

This result indicate that graduate of electrical installation craft practice is within the range of fair to good in their demonstration of important skills, though there are some perceived shortfall but not a large gap at the top level of the hierarchy.

In this study, the result of a one-sample t-test are shown on Table 6.15. The result on ratings of graduate demonstration of electrical installation skills is shown above. The respondents are of the view that six out of thirteen were rated good. These are job readiness; technical skills; comprehension ability, problem solving; speaking and listening and interpersonal skills. Meanwhile, all other t-values carrying negative signs are rated fair and these includeleadership; negotiation; written communication; reading; time management; core skill for learning and thinking skills. In this research the importance of the one-sample t-test was to determine whether the sample population considered a specific skill to be important than others.

6.4.3 Methods of skills acquisition for TVE college electrical installation graduates

This table shows that the respondents agreed that apprenticeship (Strongly agreed and Agreed: n=253; 96.9%) and formal form of learning (Strongly agreed and agreed: n=157; 64%) are the best ways to acquire skills needed in construction industry by technical college students. They however, disagreed with the possibility of trial and error or shadowing being the best ways.

Apprenticeship which is a form of training that allow individual to combine work and study by mixing on the job training with classroom learning with the aim of studying for a formal qualification has a mean score of 4. 0536, which shows clearly that the respondents agreed that apprenticeship is the best option for skill acquisition needed by the technical college graduates, this was tested on a 5point Likert scale and a test value of 3.5 was applied.

The second option for method of skill acquisition agreed by the respondent is the formal form of learning, which is a type of learning program in which the goals and objectives are well stated by the school or the training department with a set curriculum guiding the study with the intention of awarding a certificate. The formal form of learning is always a replica of the school setting system, here it has a mean score of 3.75 on a 5-point Likert scale and a test value of 3.5 was applied. They agreed

that this will be the second method of skill acquisition recommended for TVE college electrical installation graduates.

Table 6-16: One Sample Statistics of Skills Acquisition

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Apprenticeship	261	4.0536	0.58589	0.03627
Formal learning	261	3.7548	0.8465	0.0524
Trial and error	261	1.705	0.59577	0.03688
Shadowing	261	1.6782	0.80614	0.0499

Table 6-17: One Sample Test of Skills Acquisition

One-Sample Test						
	Test Value = 3.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Apprenticeship	15.266	260	0	0.55364	0.4822	0.6251
Formal learning	4.863	260	0	0.25479	0.1516	0.358
Trial and error	-48.676	260	0	-1.79502	-1.8676	-1.7224
Shadowing	-36.511	260	0	-1.82184	-1.9201	-1.7236

Table 6.17 shows the t-test analysis and result of the methods of skills acquisition for TVE college electrical installation graduates. The respondents were of the view that two out of the four options were important. From the respondents rating, the topmost methods of skills acquisition method is the apprenticeship and the formal learning, while the trial and error and shadowing were not considered as one of the methods for acquring skills. The result of a one-sample t-test was carried out to determine whether the sample population considered a specific method of acqiring skill to be imortant or otherwise.

6.4.4 Respondents' perception of skills of TVE college electrical installation graduates

There were three questions related to the overall perception of adequacy of skills of technical college graduates. Respondents on this table agreed with one of the three statements, asserting that the technical college graduates employed by companies have skill deficiencies (n=126; 48.3%). However, they did not agree with the statements that they were dissatisfied or that the graduates were not suitable.

The first question is about the employers not being satisfied with the overall performance of technical college graduates. The overall response was that (121; 46.4%) employees disagreed in their response/ option, that in overall, they are not satisfied with the performance of technical college graduates employed by their company this means that they were satisfied.

The second question is about skill deficiencies, the overall respondents which were (126; 48.3%) agreed that the graduates were skill deficient, which means they were not satisfied.

The third question is about whether the graduates employed suitable for the position applied for, the overall response was (193; 73.9%) respondents disagreed in their option, this means that they were satisfied.

Result on the perception of skills acquired of TVE college electrical installation graduates are shown in Table 6.19, the respondents are of the view that the graduate's skill were not adequate for the position employed for, though 126 respondents agreed with one of the statements, asserting that the technical college graduates employed by companies have skill deficiencies.

The result of a one-sample t-test was carried out to determine whether the sample population considered a specific skill to be important than others or otherwise. The t-test affirmed that all the skills showed a negative sign which stipulates that they are below the test value.

Table 6-18: One Sample Statistics of Perception of Skills

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Dissatisfaction	261	2.63	0.82	0.051
Skill deficiencies	261	3.1111	0.93187	0.05768
Non-suitability	261	1.8774	0.51916	0.03214

Table 6-19: One Sample Tests of Perception of Skills

One-Sample Test						
	Test Value = 3.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Dissatisfaction	-17.167	260	0	-0.872	-0.97	-0.77
Skill deficiencies	-6.742	260	0	-0.38889	-0.5025	-0.2753
Non-suitability	-50.493	260	0	-1.62261	-1.6859	-1.5593

The responses to these questions therefore indicate a reasonable level of overall satisfaction with the employed TVE graduates despite some skills deficiencies.

6.5 Specific skills and abilities of employees and measurement of skills gap

This section looks at a set of skills expected of electrical installation graduate to have acquired during training, which are included in the curriculum guiding electrical installation program and the measurement of skills gap within the aforementioned skills at a more detailed level.

6.5.1 Measurement of skills gap in the quality of TVE college electrical installation graduates

In measuring skills gap, some analysis must be carried out among the higher-level skills, so as to give a clearer picture of some skills that students are deficient in during the course of their training.

In doing this we have to make a comparison between two tables. Comparing the importance of generic skills needed by electrical installation craft men to the rating of graduate demonstration of electrical skills.

Comparison between ratings of importance of skills needed by electrical installation craft men to ratings of graduate demonstration of electrical installation skills, using test value of 3.5

Table 6-20: Importance of generic skills needed by electrical installation craft men

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Thinking ability	261	4.3103	0.533	0.03299
Comprehension ability	261	3.8084	0.44037	0.02726
Reading skills	261	4.4483	0.56348	0.03488
Written communication skills	261	3.9693	0.63777	0.03948
Speaking and listening skills	261	3.6782	0.762	0.04717
Leadership skills	261	3.6897	0.51836	0.03209
Negotiation skills	261	3.8391	0.67722	0.04192
Time management skills	261	4.3602	0.92434	0.05722
Problem solving ability	261	4.7586	0.61953	0.03835
Interpersonal skills	261	4.1379	0.59172	0.03663
Core skills for learning	261	3.9579	0.9126	0.05649
Technical skills	261	4.5824	0.67789	0.04196
Job readiness skills	261	4.5824	0.70569	0.04368

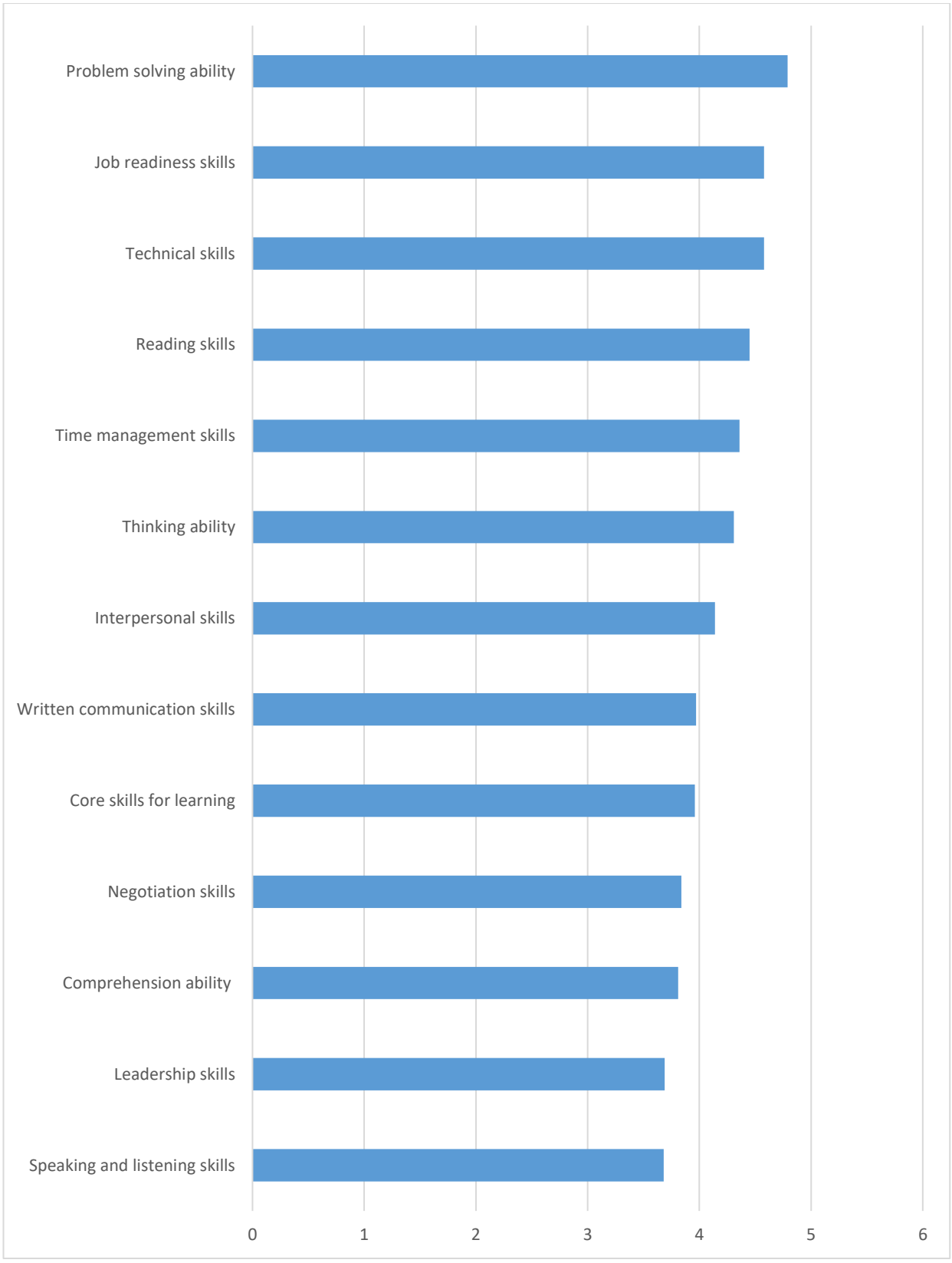

Figure 6-1: The Degree of Importance of Higher-Level Skills

Table 6-21: Rating of graduate demonstration of electrical skills

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Thinking ability	261	3.4981	0.63017	0.03901
Comprehension ability	261	3.6092	0.60172	0.03725
Reading skills	261	3.1188	0.47765	0.02957
Written communication skills	261	3.1226	0.48863	0.03025
Speaking and listening skills	261	3.5747	0.62571	0.03873
Leadership skills	261	2.9732	0.69285	0.04289
Negotiation skills	261	3.1073	0.7721	0.04779
Time management skills	261	3.295	0.58271	0.03607
Problem solving ability	261	3.59	0.78724	0.04873
Interpersonal skills	261	3.5556	0.63985	0.03961
Core skills for learning	261	3.4713	0.65935	0.04081
Technical skills	261	3.8889	0.90251	0.05586
Job readiness skills	261	3.8966	0.48914	0.03028

The criteria used is 5-point Likert scale using a test value of 3.5. Looking at the importance level table it is vividly shown that the thirteen skills listed are all important, while looking at the rating of graduate demonstration (which stands for the students' performance) of electrical skills we could see some deficiencies in some skills that fall below 3.5 at the low performance row. This will be clearer by looking at the table in the next page.

Table 6-22: Skill Deficiencies of Electrical Installation Graduates

List of skills	High Importance	Low Importance	High Performance	Low Performance
Thinking ability	✓			✓
Comprehension ability	✓		✓	
Reading skills	✓			✓
Written communication skills	✓			✓
Speaking and Listening skills	✓		✓	
Leadership skills	✓			✓
Negotiation skills	✓			✓
Time management skills	✓			✓
Problem solving ability	✓		✓	
Interpersonal skills	✓		✓	
Core skills for learning	✓			✓
Technical skills	✓		✓	
Job readiness skills	✓		✓	

Table 6-23: Skills Performance Hierarchy

High Performance Low Importance	High Performance High Importance ➢ Comprehension Ability ➢ Speaking and Listening ➢ Problem solving ➢ Interpersonal skill ➢ Technical Skills ➢ Job Readiness skill
Low Performance Low Importance	Low Performance High Importance ▪ Thinking Ability ▪ Reading skills ▪ Written Communication Skills ▪ Leadership Skills ▪ Negotiation Skills ▪ Time Management Skills ▪ Core Skills for Learning

The interpretation of the above tables are that the listed 13 skills are all important for graduates to be employable. They all belong to employability skills. None of the skills has low importancelow performance, and six skills belong to high importancehigh performance group where the graduates performed excellently well. These are comprehension ability; speaking and listening skills; problem solving ability; interpersonal skills; technical skills and; job readiness skills. The deficiencies/gap in skills are found under the low performance row which are, thinking ability; reading skills; written communication skills; leadership skills; negotiation skills; time management skills; and core skills for learning.

In other to carry out the skills gap analysis for the 42 skills for electrical installation graduates, each of the skills is attached to where they belong under the thirteen higher level skills so as to draw conclusion on where the gap exists.

Table 6-24: Measurement of skills-gap

		Mean	Std. Deviation	Test Value = 3.5						
				t	df	Sig. (2-tailed)	Sig.(1-tailed)	Mean Diff.	95% Confidence Interval of the Difference	
									Lower	Upper
1	Represent written materials for various tasks.	2.908	0.617	-13.6	260	0	0	-0.5192	-0.594	-0.444
2	Understand how to solve technical problems.	3.9234	0.414	16.54	260	0	0	0.4234	0.373	0.474
3	Listen and share ideas with other colleagues.	3.249	0.629	-6.447	260	0	0	-0.251	-0.328	-0.174
4	Communicate verbally and in writing.	3.148	0.738	-7.838	260	0	0	-0.3582	-0.448	-0.268
5	Use Megger Multi metre for measuring current, voltage and resistance.	4.0805	0.768	12.21	260	0	0	0.5805	0.487	0.674
6	Carry out electrical practical tasks individually at the site.	4.046	0.532	16.6	260	0	0	0.546	0.481	0.611

		Mean	Std. Deviation	Test Value = 3.5						
				t	df	Sig. (2-tailed)	Sig.(1-tailed)	Mean Diff.	95% Confidence Interval of the Difference	
									Lower	Upper
7	Participate actively in workteam discussion.	3.9004	0.389	16.61	260	0	0	0.4004	0.353	0.448
8	Test knowledge of mathematics into practice.	3.046	0.88	-8.333	260	0	0	-0.454	-0.561	-0.347
9	Measure the luminous intensity of illumination.	3.4559	0.815	-0.873	260	0.383	0.192	-0.0441	-0.143	0.055
10	Apply related knowledge into practice.	3.954	0.348	21.09	260	0	0	0.454	0.412	0.496
11	Measure voltage in an installation.	4.1379	0.485	21.27	260	0	0	0.6379	0.579	0.697
12	Implement I.E.E Regulations safety standards.	3.6245	0.83	2.423	260	0.016	0.008	0.1245	0.023	0.226
13	Operate machines during practical work on site.	3.9693	0.289	26.21	260	0	0	0.4694	0.434	0.505

		Mean	Std. Deviation	Test Value = 3.5						
				t	df	Sig. (2-tailed)	Sig.(1-tailed)	Mean Diff.	95% Confidence Interval of the Difference	
									Lower	Upper
14	Integrate devices to achieve given practical tasks.	3.7969	0.465	10.32	260	0	0	0.2969	0.240	0.354
15	Read and interpret various electrical installation drawings.	3.6207	0.803	2.43	260	0.016	0.008	0.1207	0.023	0.219
16	Participate in motivating peers	3.4828	0.559	-0.499	260	0.619	0.31	-0.0172	-0.085	0.051
17	Exhibit self-confidence.	3.8084	0.449	11.1	260	0	0	0.3084	0.254	0.363
18	Commit themselves to continuous vocational improvement in electrical works.	4.0805	0.524	17.91	260	0	0	0.5805	0.517	0.644
19	Communicate with people from other culture, religion and background.	3.4904	0.802	-0.193	260	0.847	0.424	-0.0096	-0.107	0.088
20	Understand others behaviour and attitudes.	3.4981	1.108	-0.028	260	0.978	0.489	-0.0019	-0.137	0.133

		Mean	Std. Deviation	Test Value = 3.5						
				t	df	Sig. (2-tailed)	Sig.(1-tailed)	Mean Diff.	95% Confidence Interval of the Difference	
									Lower	Upper
21	Relate in a positive manner with other co-workers.	3.8008	0.502	9.671	260	0	0	0.3008	0.240	0.362
22	List practical terms and tasks in electrical works.	4.1111	0.471	20.94	260	0	0	0.6111	0.554	0.669
23	Understand company organisational structure.	3.6628	0.549	4.793	260	0	0	0.1628	0.096	0.230
24	Acknowledge communication channels.	3.6245	0.531	3.791	260	0	0	0.1245	0.060	0.189
25	Observe issues such as interpersonal, personal and cultural aspects of co-workers.	3.6858	0.465	6.455	260	0	0	0.1858	0.129	0.243
26	Organise and carry out conduit and surface wiring.	3.6092	1.277	1.381	260	0.168	0.084	0.1092	-0.047	0.265
27	Diagnose and rectify faults in an installation.	3.4598	1.158	-0.561	260	0.575	0.288	-0.0402	-0.181	0.101

		Mean	Std. Deviation	Test Value = 3.5						
				t	df	Sig. (2-tailed)	Sig.(1-tailed)	Mean Diff.	95% Confidence Interval of the Difference	
									Lower	Upper
28	Follow industry rules and regulations	4.1264	0.72	14.05	260	0	0	0.6264	0.539	0.714
29	Settle work related conflicts.	3.2912	1.137	-2.968	260	0.003	0.002	-0.2088	-0.347	-0.070
30	Perform well to solve problems related to electrical installation.	3.4559	1.158	-0.615	260	0.539	0.27	-0.0441	-0.185	0.097
31	Recognise effective decisions in certain tasks.	3.1571	1.093	-5.069	260	0	0	-0.3429	-0.476	-0.210
32	Demonstrate a positive attitude to change.	4.2261	0.894	13.13	260	0	0	0.7261	0.617	0.835
33	Generate new ideas during practical task on site.	3.318	1.351	-2.176	260	0.03	0.015	-0.182	-0.347	-0.017
34	Use available and new technology in implementing practical tasks.	2.9655	1.181	-7.311	260	0	0	-0.5345	-0.678	-0.391

		Mean	Std. Deviation	Test Value = 3.5						
				t	df	Sig. (2-tailed)	Sig.(1-tailed)	Mean Diff.	95% Confidence Interval of the Difference	
									Lower	Upper
35	Relate theoretical information to practical tasks.	3.9808	0.205	37.93	260	0	0	0.4808	0.456	0.506
36	Propose innovative ideas for certain tasks.	3.2797	1.145	-3.11	260	0.002	0.001	-0.2203	-0.360	-0.081
37	Manage practical tasks effectively.	3.1379	1.236	-4.734	260	0	0	-0.3621	-0.513	-0.211
38	Perform well in working practically with others at workplace.	4.2682	0.783	15.86	260	0	0	0.7682	0.673	0.864
39	Maintain good rapport with supervisors and peers.	3.8238	1.318	3.967	260	0	0	0.3238	0.163	0.484
40	Participate as leaders in certain tasks.	3.8238	0.401	13.03	260	0	0	0.3238	0.275	0.373
41	Justify and respect other people ideas, participations and opinions.	3.636	0.771	2.851	260	0.005	0.003	0.136	0.042	0.230
42	Apply the acquired principles to technical issues at workplace.	3.9885	0.186	42.5	260	0	0	0.4885	0.466	0.511

The result of a one-sample t-test on the ratings of the measurements of skills gap are shown in table 6.24. In this research the one sample t-test was carried out to determine whether the sample population considered a specific skill to be important or otherwise.The skills listed are of very paramount importance to the company.The respondents are of the view that all the skills listed were important. From the respondents rating, the topmost important skills wereitems 2, 5, 6, 7, 10, 11, 12, 13, 14, 15, 17, 18, 21, 22, 23, 24, 25, 26, 28, 32, 35, 38, 39, 40, 41 and 42. Among the specific skills showing deficiencies are item 1: ability to represent written materials for various tasks; item 3: Listening and sharing ideas with other colleagues; item 4: Communicating verbally and in writing; item 8: Putting knowledge of mathematics into practice; item 9: Measuring the luminous intensity of illumination; items 16; 19; 20;27;29; 30; 31; 33; 34; 36 and 37. The items showing deficiencies falls below the test value.

Table 6-25: Degree of Important skills and Performance of electrical installation graduates

Skills	High Importance	Low Importance	High Performance	Low Performance
Thinking ability	✓			✓
1- Represent written materials for various tasks.				✓
2- Read and interpret various electrical installation drawings.			✓	
-3 Propose innovative ideas for certain tasks.				✓
Comprehension ability	✓		✓	
Reading skills	✓			✓
Written communication skills	✓			✓
Speaking and listening skills	✓		✓	
4- Communicate verbally and in writing.				✓
Leadership skills	✓			✓

Skills	High Importance	Low Importance	High Performance	Low Performance
5- Participate in motivating peers				✓
6- Participate as leaders in certain tasks.			✓	
Negotiation skills	✓			✓
Time management skills	✓			✓
Problem solving ability	✓		✓	
7- Test knowledge of mathematics into practice.				✓
8- Commit themselves to continuous vocational improvement in electrical works			✓	
Interpersonal skills	✓		✓	
9- Listen and share ideas with other colleagues				✓
10- Participate actively in work team discussion.			✓	
11- Exhibit self-confidence.			✓	
12- Understand others behaviour and attitudes.			✓	✓
13- Relate in a positive manner with other co-workers.			✓	
14- Understand company organisational structure.			✓	
15- Acknowledge communication channels.			✓	
16- Observe issues such as interpersonal, personal and cultural aspects of co-workers.			✓	
17- Follow industry rules and regulations			✓	✓
18- Settle work related conflicts.			✓	✓

Skills	High Importance	Low Importance	High Performance	Low Performance
19- Recognise effective decisions in certain tasks. 20- Perform well in working practically with others at workplace. 21- Maintain good rapport with supervisors and peers. 22- Justify and respect other people ideas, participations and opinions.			✓	
Core skills for learning	✓			✓
Technical skills	✓		✓	
23- Understand how to solve technical problems.			✓	
24- Use Megger Multi metre for measuring current, voltage and resistance.			✓ ✓	
25- Carry out electrical practical tasks individually at the site.				✓
26- Measure the luminous intensity of illumination.			✓	
27- Apply related knowledge into practice.			✓ ✓	
28- Measure voltage in an installation.			✓	
29- Operate machines during practical work on site.			✓	
30- Integrate devices to achieve given practical tasks.			✓	
31- List practical terms and tasks in electrical works.				✓
32- Organise and carry out conduit and surface wiring				✓

Skills	High Importance	Low Importance	High Performance	Low Performance
33- Diagnose and rectify faults in an installation.				✓
34- Perform well to solve problems related to electrical installation.				✓
35- Generate new ideas during practical task on site.			✓	
36- Use available and new technology in implementing practical tasks.			✓	✓
37- Relate theoretical information to practical tasks.				
38- Manage practical tasks effectively.				
39- Apply the acquired principles to technical issues at workplace.				
Job readiness skills	✓		✓	
40- Implement I.E.E Regulations safety standards.			✓	
41- Communicate with people from other culture, religion and background.			✓	✓
42- Demonstrate a positive attitude to change.				

The table above shows that 42 skills listed have some measures of gap as none yielded a mean score of 5.00. The specific skills were tested on a 5-point Likert scale with a mean score of 3.50 and a test value of 3.5 was applied.

After grouping the skills under the importance of skills needed by the electrical installation craftsmen, 16 skills show deficiencies or skills gap up to 1.5 (-1.5) on the scale. Among the specific skills showing deficiencies are item 1: ability to represent written materials for various tasks; item 3: Listening and

sharing ideas with other colleagues; item 4: Communicating verbally and in writing; item 8: Putting knowledge of mathematics into practice; item 9: Measuring the luminous intensity of illumination;.

The table further shows that the remaining 26 areas yielded mean scores around 4.00 out of the maximum obtainable mean score of 5.00 indicating moderate skills gap of minus 1(-1) on the scale. These are on items 2, 5, 6, 7, 10, 11, 12, 13, 14, 15, 17, 18, 21, 22, 23, 24, 25, 26, 28, 32, 35, 38, 39, 40, 41 and 42. Above all, the weighted average of 3.66 out of 5.00 highest score possible, indicates an overall skills gap of -1.34. This shows that there is a deficiency of up to 26.8% in the skills measured.

6.6 Suggestions for improvement of skills development or electrical installation programme

After the analysis had been conducted, it was clearly shown that gaps exist between the requirements of industry and the skill levels of technical college graduates in some skills, which calls for improvement. This section will proffer possible solution for improvement.

6.6.1 Respondents disposition towards engagement with educational institutions

This table shows that items 1 and 5 yielded mean scores of 3.79 and 3.80 respectively. These indicate an approximate value of 4.00 on the scale, therefore, tending towards 'Agree'. These imply that respondents agreed that partnership and collaborations between electrical installation companies and TVE colleges would ensure graduates match labour market needs as well as help in placements, industrial attachments and internship. The three other items: 2, 3 and 4 falls under mean score of 3.50 which indicate 'Neither Agree nor Disagree'.

From the table, we can deduce that there was communication gap between the industry and technical and vocational colleges as shown by the mean score is (2.73) which falls below 3.50.This shows that colleges are not communicating with the industry and this may have an adverse effect on the

quality or industry relevance of the education for TVE students. Interestingly, it shows vividly from the table that the industry does not receive invitation from the college during curriculum development in as much there is lack in communication, thereby causing failure to incorporate important employability skills needed by the industry. In the area of employment, it shows that industry slightly receives invitation for recruitment of their graduates.

Table 6-26: One Sample Statistics of Respondents Disposition

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Electrical installation companies engaging with TVE colleges would ensure that the graduates match the labour market needs.	261	3.7893	0.4699	0.02909
My company communicates with TVE colleges.	261	2.728	0.92754	0.05741
My company receives invitations for recruitment in technical colleges.	261	3.249	0.60387	0.03738
My company would like to engage more with TVE colleges in areas of placements, industrial attachments and internship.	261	3.8008	0.47894	0.02965
My company receives invitations from TVE colleges to develop curricula.	261	2.5211	1.29664	0.08026

Table 6-27: One Sample Statistics of Respondents Disposition

One-Sample Test						
	Test Value = 3.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	

One-Sample Test						
	Test Value = 3.5					
					Lower	Upper
Electrical installation companies engaging with TVE colleges would ensure that the graduates match the labour market needs.	9.945	260	0	0.28927	0.232	0.3465
My company communicates with TVE colleges.	-13.447	260	0	-0.77203	-0.8851	-0.659
My company receives invitations for recruitment in technical colleges.	-6.714	260	0	-0.25096	-0.3246	-0.1774
My company would like to engage more with TVE colleges in areas of placements, industrial attachments and internship.	10.145	260	0	0.30077	0.2424	0.3591
My company receives invitations from TVE colleges to develop curricula.	-12.197	260	0	-0.97893	-1.137	-0.8209

6.6.2 Suggestions for improving quality of technical college graduates

The suggestions proffered reveal a number of realities that are worth emphasizing. First, they proffer solution for improving the quality of vocational technical education.

Second, all the suggestions have the average mean score of 4.62 which is an indication that the suggestion for improvement were very important to the programme, instructors and students at large.

Third, it is evident that the program will experience reformation.

Those suggestions rated as very important are curriculum review (mean=4.61; SD=.58), instructors' refresher course (mean=4.64; SD=.58), provision of modern equipment (mean=4.80; SD=.55), loans and scholarship for students (mean=4.62; SD=.59) and improvement in library and ICT facilities (mean=47; SD=.53). The only solution rated as 'Important' is collaboration with industry and companies (mean=4.28; SD=.59). The average mean score of 4.62 confirms the indication of the suggested solutions as 'Very Important'.

Table 6-28: One-Sample Statistics of improving quality of technical college graduates

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Curriculum review	261	4.6054	0.58294	0.03608
Refresher course for instructors.	261	4.636	0.57653	0.03569
Provision of modern equipment and tools	261	4.8008	0.55345	0.03426
Collaboration with industry and companies	261	4.2835	0.59814	0.03702
Encouraging the students with loans and scholarship to learn	261	4.6169	0.59383	0.03676
To improve the standard of library/ ICT facilities	261	4.7739	0.525	0.0325

Table 6-29: One-Sample Test of improving quality of technical college graduates

One-Sample Test						
	Test Value = 3.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Curriculum review	30.634	260	0	1.10536	1.0343	1.1764
Refresher course for instructors.	31.833	260	0	1.13602	1.0657	1.2063
Provision of modern equipment and tools	37.97	260	0	1.30077	1.2333	1.3682
Collaboration with industry	21.163	260	0	0.78352	0.7106	0.8564

and companies						
Encouraging the students with loans and scholarship to learn	30.385	260	0	1.11686	1.0445	1.1892
To improve the standard of library/ ICT facilities	39.202	260	0	1.27395	1.21	1.3379

6.7 Summary of the Chapter

The purpose of this chapter is to analyse the survey collected from the respondents so as to examine the notion and reach a conclusion on what the literature says in terms of educational disparity between Northern and southern zone of Nigeria, employers perceptions of the importance of certain skills needed for employment found lacking in technical college graduates, the issue of out of date curricula and the skills gap found prevailing amongst the technical college graduates.

This chapter is based on data collected from Northern and Southern part of Nigeria to provide analytical information on how employers perceive technical college graduates' skills and abilities in the workplace. A survey was administered to collect data for this study.

The intended purpose for the research is achieved, though part of the analysis provided the scope of the research and how it was tailored to address the research questions number one, which is to identify desirable skills that are in demand by the industry, and methods adopted in measuring the skills gap. It addresses objective two which is to develop a framework for the measurement of skills gap in industry and, ultimately assess the level of competence of graduates of technical college in areas of electrical practice, as well as the qualities of these set of graduates and the nature of the relationship with the construction industry.

The demographic information was not attached to any specific questions, however it provided general information for the study. Both descriptive and

inferential statistics were used for the analysis. Descriptive statistics were used to determine participant's demographic-related responses. Sections B, C and D were used to answer the research questions, information on employers need and areas where the skills gap exists.

The findings indicated varied responses from demographic information, skill acquisition and importance of skills needed by electrical installation craft men, methods of skills acquisition, a development of framework upon which the measurement of skills gap was based upon and suggestions for improving the quality of technical college graduates.

The skills gap analysis revealed areas where students are deficient, and all the skills were listed in order to correct the abnormalities and for corrective purpose, probably through the pedagogy or the curriculum.

The analysis was carried out in all areas of skills to include skills acquisition, ratings of importance of skills, rating of graduate demonstration of electrical installation skills, methods of skill acquisition and measurement of skills gap and ways of improving the curriculum among others.

Chapter 7 : DISCUSSION OF THE FINDINGS

7.1 Introduction

Chapter 5 presented the qualitative inquiry and chapter 6 presented the results of the quantitative phase. In this chapter the results from the two chapters are discussed in relation to the extant literature on the research subject.

The aim of this research is to create a measuring and mapping framework to address the construction skills gap through improved technical and vocational education with particular reference to the challenges inherent in the Nigerian Electrical installation programme.

In stage one, the qualitative interview was conducted. Six focus groups were organised to conduct the interview. The focus group (FG) interviews were the first stage of data collection method observed for the study. Thus, the first and third research objectives,understanding the theoretical underpinning and state-of-the-art practice in identification of skills gap in academic, generic, technical, practical and employability skills required for employment in construction industry and,designing a framework to access the curriculum of TVE with a view to map the curriculum with the gap was met. Likewise, the second research question, whichis the curriculum of vocational education in area of electrical installation satisfy the skills demand of the construction industry in terms of graduate students performing professional duties and responsibilities as needed? Was met in chapter five (interview analysis).

The survey using the questionnaire were the second level ofanalysis, thus, the first and second research objectives to understand the theoretical underpinning and state-of-the-art practice in identification of skills gap in academic, generic, technical, practical and employability skills required for employment in construction industry and,a framework for the measurement of skills gap was developed. A quantitative approach which enablea comprehensive product activity for measuring skills gap to be communicated to stakeholders and, to answer the research question one identifying

desirable skills that are in demand by the industry and methods adopted in measuring the skills gap were met in chapter six.

This chapter discusses the results of the two methods used in this research. The qualitative results of the focus group interview (Chapter five), and survey questionnaires (Chapter Six) were all presented in the light of the research literature (Chapter two) and the background of the research study on (Chapter Three). The findings are grouped in terms of the research questions presented in chapter one, and each of the questions is answered on the basis of the research findings and in relation to the literature reviewed in an earlier chapter.

7.2 Vocational Technical Education Curriculum Requirements

Research Question 1: The first research question is identifying desirable skills that are in demand by the industry, and methods adopted in measuring the skills gap. This goes along with objective two which is the development of a framework for the measurement of skills gap in construction industry.

Technical institutions all over, have been recognised for imparting the necessary skills required needed for employment, knowing fully, that skills acquisition is through both formal and informal settings. It was noted that craft workers lack the required skill to work in industries (Ofori, 2000). The issue of skills gap stemmed from the fact that the craft workers are lacking from the skills required for work. Technical Vocational Education and Training (TVET) have been identified as a tool that can help improve the technical knowhow in industries, they are in charge of training, which signify that, all the skills needed in industry are expected to have been imparted in there graduates, the TVET is in position to equip the craft workers with the key skills needed for work (Jayaram &Engmann, 2017), contrary to this the quantitative analysis result shows that all the thirteen skills identified in the literature review which were thinking ability, comprehension ability, reading skills, written communication skills, speaking and listening skills, leadership skills, negotiation skills, time management skills, problem solving ability,

interpersonal skills, core skills for learning, technical skills and job readiness skills are all important to the employers. The result revealed that the respondents rated of the skills as '5-Very Important. These are: 1. Problem-solving ability (mean=4.79; SD=.92) 2. Job readiness (mean=4.58; SD=.71) and 3. Technical Skills All other skills were rated with 4 'Important' and they include reading ability (mean=4.45; SD=.56) time management skills (mean=4.36; SD=.92), thinking skills (mean=4.31; SD=.53) and interpersonal skills (mean=4.14; SD=.59). The remaining skills rated as 'important' (mean approximately 4) by the respondents are: written communication skills, core skills for learning, negotiation skills, comprehension ability, leadership skills as well as speaking and listening skills (mean averages between 3.69 and 3.97). By these results, all the skills were rated as important by the respondents. However, job specific skills were rated more highly than cognitive skills and management skills.

Failure on the part of the education to provide skill and education contributes to the issue of the skills gap that has become a major problem.

However, the reviewed literature had always emphasized on technical and vocational education and training as an aspect of education that deals with the teaching of skills, knowledge and attitudes to cover the affective, psychomotor and cognitive domains, such that the students will be able to fit into the world of work (Awe et al., 2010; Olaitan et al., 2006). Failure to satisfy the demand of the industry in area of skills performance resulted into skills gap faced by the industries, this stands as an evidence that the school is lacking in providing the skills necessary for work.

The focus group interview (FGI) revealed that the teaching of the identified skills in area of technical, communication, literacy and problem-solving skills portrays some challenges from the perspectives of the instructors. Here we have one of the instructors discussing major challenge found wanting among the members of the teaching group.

On this issue, one of the electrical installation instructors at (FG 6) said that,

''Before a teacher can teach all the skills mentioned, he or she should have undergone training in education, some of us, instructors do not have a requisite qualification in education, to impact this skills becomes a problem because of lack of post graduate diploma in education, or at least a degree in education is necessary to make us qualify as a trained teacher. My advice is for the teachers to go for teachers training programme in education'' (FG 1 participant)

Here an electrical instructor was trying to prove innocence that the problem emanated from the federal government for failure to provide tools, equipment's and finance for training of skills required for employment.

An electrical instructor contributed and said that:

''Though we have discussed the issue of curriculum, scheme of work, syllabus and the rest educational documents. It must be noted that all the skills are already being embedded in the courses, skills are not to be taught in isolation, but the major problem identified from my own perception is that materials to be used for teaching this skill are not readily available both from the government, industry and the students. The issue of improvisation on the part of the technical instructors is not there, so that is the more reason why students show deficiencies in skills mentioned. These skills are found wanting in our graduates.''(FG 4 Participant).

This is an evidence that proves that students are deficient in some skills, the educational sector is having some underlying challenges in training their graduates when it comes to instilling skills into their graduates.

The qualitative findings of this study, the focus group (FG) discussion, the participants did not argue whether a skill is desirable or not, the instructors focused their discussion mainly on the technical skills and complained about lack of equipment thus, they perceive the technical skills are the most important.However, it is important to note that questionnaire respondents and educators concurred on the primacy of technical skills.

The statement from one of the instructors from one of the technical colleges indicates that some of the instructors are un-qualified and this shows that you cannot give what you don't have, all these contributes to the deficiencies in skills mentioned.

''Before a teacher can teach all the skills mentioned, he or she should have undergone training in education, some of us, instructors do not have a requisite qualification in education, to impact this skills becomes a problem because of lack of post graduate diploma in education, or at least a degree in education is necessary to make us qualify as a trained teacher. My advice is for the teachers to go for teachers training in education'' (FG 1 participant)

Research Question 2: The second research question is about method that was adopted in measuring the skills gap. This is in conformity with objective 2 which aims at developing a framework for the measurement of skills gap in industry. A framework for the measurement of framework was developed using survey and a quantitative approach which enable a comprehensive product activity for measuring skills gap, which was communicated to the stakeholders. The quantitative analysis carried out on measurements of skills gapusing a one-sample t-test on the ratings of the measurements of skills gap are shown in table 6.24. Though all skills show signs of little gap as they could not measure up to 5-point on the Likert scale. Those that measure less than the test value of 3.5 are the specific skills showing deficiencies these are sixteen in number item 1: ability to represent written materials for various tasks; item 3: Listening and sharing ideas with other colleagues; item 4: Communicating verbally and in writing; item 8: Putting knowledge of mathematics into practice; item 9: Measuring the luminous intensity of illumination; items 16; 19; 20; 27; 29; 30; 31; 33; 34; 36 and 37. The items showing deficiencies falls below the test value. This confirms that skills gap exists in the skills of the craft workers.

The quantitative findings of this study suggested seven skills which are among the desirable skills that are in demand by the construction industry in the literature but in which the craft workers are found to be deficient to include

academic or cognitive skills, generic skills, technical skills, soft skills and employability skills. This finding is like those skills identified in the literature to be cognitive especially numeracy, and critical thinking, non-cognitive especially communication, leadership, and decision-making and technical skills among the craft workers (Jayaram &Engmann, 2017, Lututala, 2012). The findings of this research are similar to some extent to the findings of Hogarth & Wilson, (2001) research which revealed the main occupation associated with skill shortage vacancies in area of craft and skilled trades. These include several hybrid skills, that is mixture of technical skills, or technical and generic skills in combination. Hogarth & Wilson (2001) revealed that most establishments reporting skills gap, defined their problems in terms of employees lacking a desired mix of generic and vocational skills, though the findings of this research does not suggest large deficiencies in technical and vocational skills. In many respects' employers were looking for hybrid skills that may be classified accordingly, as a mix of generic skills; a mix of technical skills; and a mix of both generic and technical skills. It is apparent that, for most construction industries, skills gaps were multi-faceted depending on the area of which the case study was undertaking.In a similar vein, the findings of this quantitative research is similar to that of Ndoye& Walther, (2012) which highlighted similar skills gap found in craft workers in Africa and which are needed, to be communication skills, literacy, numeracy and cognitive skills. Similarly, the finding of this study is equally similar to a focus group interview conducted by the National University of Educational Planning and Administration (NUEPA) on curricula skills in South and South Asia on employers, the researchers focused mainly on four areas to include perception of skills, requirements of general skills, possibility of acquiring skills at school and sector-specific skill gaps. The key skill gaps identified are non-cognitive skills especially communication skills, leadership skills, honesty/ethics skills, teamwork, and flexibility skills and similarly the findings of this study is equally similar to the skills identified by the construction industry to be of importance to include, academic or cognitive skills, generic

skills, technical or vocational skills and work related attitudes or soft skills (Stasz, 2001).

Research Question 3: The third research question investigates if the curriculum of vocational technical education in area of electrical installation satisfy the skills demand of the construction industry in terms of graduate students performing professional duties and responsibilities as needed? The quantitative analysis indicates that the overall, which were (126; 48.3%) of the population agreed that the graduates were skill deficient, which means that the respondents from the industry were not satisfied. Out of the 42 skills listed for assessment of the electrical installation graduates, it was noticed that all the 42 skills listed have some measures of gap as none yielded a mean score of 5.00. Majorly 16 skills show deficiencies or skills gap using a one-sample test, this clearly shows that the curriculum the curriculum of vocational education in area of electrical installation does not satisfy theskills demand of the construction industry in terms of graduate students performing professional duties and responsibilities as needed.

The Nigerian government have recognised technical and vocational education and training (TVET)as a form of education that can solve the challenges facing construction industry in terms of technical competencies. The duties of the technical colleges in Nigeria revolves around providing the basic knowledge, skills and attitude to their students and to train them in other to prepare them for the world of work. The instructors in the qualitative analysis (the focus group) in that sense were divided into two groups. The majority of the instructors accepted that it is their responsibility to train the students for the world of work, while the minority was of the opinion that industry should take up the responsibility where they stopped by organising training for their graduates in their various training schools so as to supplement the initial training given to them.

The minority of the instructors said “truly the main goal of any technical institution is to spread knowledge skills and attitude. Thus, each workplace

should take up the responsibility of preparing their employees with the skills that suit and match their own specific requirements”

Instructors in technical collegesin Nigeria believe that the issue of training the students both in theory and practice guiding their discipline is solely their responsibility but there are cases and issues that made them to be handicapped, like in area of providing materials needed for teaching and learning are not available, this gives room for skills gap to be prevalent. The federal government have not provided adequate funding to purchase equipment, tools and educational facilities necessary for teaching. It was specifically stated that despite the high demand for skilled workers, observers have noted that technical college graduate suffered high unemployment due to failure to possess the required skill needed by industries for employment. These findings are like those of, Olusegun and Micheal (2011), Odusami et al. (2003) and Oloyede et al. (2010) who indicated that employers show dissatisfaction to efforts level and work attitudes of young technical graduates because of lack of skills. The issue of lack of adequate skill have become a great challenge to the institution and the learners at large. The technical and vocational education and training should look into adoption of constructivist theory guiding this study on section 3.10 of this study, because evidence have shown that the world have embraced the constructivist learning perspective in teaching the vocational and technical students, though the participants demonstrated the constructivist thinking during discussion.The recommended improvement from the constructivist perspective will suitable and adequate for this purpose.

Objective three of this study is to design a framework to access the curriculum of TVE with a view to map the curriculum with the gap. The quantitative data revealed that the curriculum of vocational education in area of electrical installation did not satisfy the skills demand of the construction industry in terms of graduate students performing professional duties and responsibilities as needed.

However, the relevant literature reviewed in chapters one and two revealed that skills should be taught and instilled in the students, as it is the bases of vocational technical education. The skill acquisition which is the ability to function in an occupation could be acquired through formal setting. Vocational technical education is that skill-based programme designed for sub-professional level education and based on a specific vocation (Olaitan et al., 1999). Meanwhile, the study revealed thirteen top hierarchy electrical installation skills to be learnt by the students to include, thinking ability skills, comprehension ability skills, reading skills, written communication skills, speaking and listening skills, leadership skills, negotiation skills, time management skills, problem solving skills, interpersonal skills, core skills for learning, technical skills and job readiness skills. The students performed excellently well only in six out of the thirteen skills listed with rating as 'good' (mean approximately 4). The other seven skills they were rated as only being 'fair' (mean approximately 3) in seven skills to include leadership skills, negotiation skills, written communication skills, reading skills, time management skills, core skills for learning and thinking skills (means range from 2.97-3.49). All the skills show evidence of some gaps, but the gaps shown in technical skills are smaller to other skills listed on the table. This clearly shows that the performance of these students on the listed set of skills are just fair on the Likert scale drawn, the students shows evidence of deficiency in those skills which is contrary to research question 3.

However, this finding is similar to those of (Oketech, 2007; Jayram &Engmann, 2017, Awe et al., 2010) who emphasise that workers skill and education are not adequate for the demands of jobs in the current economy and, that technical college graduates lack the required skills to work in industries.

The quantitative data for this study, however, did not agree with the findings of (Ogwo&Oranu, 2006; Awe et al., 2010) who complained about the technical college graduates of not possessing the adequate practical and technical skills needed for employment. In this study we could vividly see that, students are not deficient in practical and technical skills but rather in interpersonal skills.

This is an evidence to show that research does change irrespective of where and when the research was conducted. The implication of this contradiction is that, the graduates of technical colleges has improved on the core courses and it has shifted to interpersonal skills, this signify that the curriculum guiding interpersonal skills should be improved upon, and that curriculum guiding TVET needs some modifications and development as both the mapping and the measurement frameworks show evidence of skills gap.

7.3 Understanding the theoretical underpinning and state-of-the-art practice in identification of skills gap in skills

Objective one of this research was to understand the theoretical and state-of-art practice in identification of skills gap in academic, generic, technical, practical and employability skills required for employment in construction industry. The literature on skills gap in relation to electrical installation in industries was critically reviewed in other to see what the construction industry needs in in terms of the skill required for employment. In the study the top thirteen electrical skills required for employment was revealed. Forty-two electrical installation skills emanated from the thirteen top hierarchy revealed for assessing the skills gap. In depth study of the curriculum guiding electrical installation was carried out during the curriculum mapping, and it contained all the contents of electrical installation skills needed by the construction industry. Though the literature identified skills gap in academic, generic, technical, practical and employability (Stasz, 2001). Other skills in which the technical college graduates were deficient were equally identified in the literature.

During the review of the literature, three ways of measuring the skills gap were identified to include,employer opinion survey, the labour supply/demand tool using qualification or educational level as proxy and the hybrid approaches which combines the employer'sopinion survey and labour supply demand indicator and the shared classification system (Aring, 2012;

Clark, 2013; ACT, 2011). Employer's opinion survey was adopted for this research

7.4 Ratings of graduate demonstration of electrical installation skills

The federal government of Nigeria identified Technical Vocational Education and Training (TVET) as a tool that can help improve the technical knowhow in the Nigerian construction industry, through the technical colleges in training craft men in various trades, so as to ease the challenges faced by the construction industry. The training offered to the craft men is to prepare them for the workplace. The belief of the society is that it is through this formal system of training that all the skills will be taught. Having in mind that vocational technical education according to (Oranu, 2006) ''vocational education is a skill based programme designed for sub-professional level education and based on specific vocation, while technical education facilitates the acquisition of practical and applied skills as well as basic scientific knowledge'', this gives us an idea that knowledge, skills and attitudes should be instilled in their graduates before joining the world of work. The review of the literature identified the major thirteen skills that are found necessary for the craft men in the 21st century, to include thinking ability skills, comprehension ability skills, reading skills, written communication skills, speaking and listening skills, leadership skills, negotiation skills, time management skills, problem solving ability, interpersonal skills, core skill for learning, technical skills and job readiness skills.

The findings of the quantitative analysis here show that out of the thirteen top skills identified to be of importance, graduates were rated as 'good' (mean approximately 4) six out of the thirteen skills listed. The result analysing the ratings of graduate demonstration of electrical installation skills could could be found on tables 6.14 and 6.15. This clearly shows that the performance of these students on the listed set of skills are just fair, showing deficiencies in seven skills out of thirteen skills, this finding is similar to those found in review of literature, that students of technical colleges are not performing well in some skills at the workplace (Oketch, 2007; Ogwo&Oranu, 2006; Awe et al.,

2010, Jayaram &Engmann, 2017) meanwhile employersin the construction industry are looking for the skilled workforce with right employability skills (Crowson *et al*., 2000; Jayaram &Engmann, 2017) and qualities so as to contribute to the development and success of the industry.

7.5 Methods of skills acquisition for TVE college electrical installation graduates

The questionnaire for this study investigated the suitability of four methods of skill acquisition for TVE Collegeelectrical installation graduates: apprenticeship, formal learning, trial and error, and shadowing. Out of the four methods investigated, the findings show that the respondents agreed that apprenticeship is the best method with 96.9% which has the greatest respondents, followed by formal learning as the second-best method of skill acquisition with 64% respondents.They however, disagreed with the possibility of trial and error or shadowing being the best ways.

This finding is similar to what review of the literature suggested as the best form of skill acquisition.In combating the skills gap, Germany has taken a drastic step in introducing dual modern apprenticeship model in combating the gap and resolving the challenges that are prevailingand theyconcluded that vocational technical education is the answer (OECD, 2011). Presently, dual apprenticeship has been adopted by other countries like Switzerland, Denmark and Austria, the result from 17 countries (OECD, 2011; Weaver & Osterman, 2017) concluded that to most teenagers, apprenticeship through vocational technical education is the most effective way to learn. They also found that this approach better facilitates the student's entries into the labour market.

Similarly, from the review of literature a researcher from U.S.A, Holzer and Lerman (2007) suggested apprenticeship help close the skills gap. The idea of apprenticeship, therefore, is widely accepted as a means to an end in resolving the issue of skills gap worldwide. The vocational education curriculum in Nigeria and even other countries should emulate the idea of

apprenticeship and should include this during curriculum review/design. The learning theory embraced by this study is constructivism as discussed in section 3.8.1 here the learner is physically engaged in the learning process, here the hands on approach was adopted as the best learning approach, it was even supported by the City and Guilds of London as the best, therefore, it is proposed that technical and vocational education institutions worldwide most especially Nigeria, should support the apprenticeships form of training. This could be included during curriculum review/design. The believe that technical and vocational education is for the never do well learners should be discarded and, the body in charge of TVET in Nigeria should support and introduce the degree apprenticeshipsinto their syllabus/curriculum as in developed countries.

7.6 Respondents' perception of skills of TVE college electrical installation graduates

In getting the overall perception of adequacy of skills of technical college graduates, the questionnaire survey posed three major statements, about question one, the findings from chapter 6, table 6.18 and table 6.19shows that (121; 46.4%) employees disagreed in their response/option, that in overall, they are not being satisfied with the overall performance of technical college graduates employed by their company, this signifies that they were satisfied.

The findings from chapter 6, table 6.18 and table 6.19 concerning question 2 shows that (126; 48.3%) employees agreed that the graduates of technical college were skill deficient, which means that the respondents were not satisfied.

The findings from chapter 6, table 6.18 and table 6.19 concerning the third question showed thatthe overall response shows that (193, 73.9%) employees disagreed in their option, that whether the graduatesemployed suitable for the position applied for which means that they disagreed that they were suitable which means that they were satisfied.

The major area of concern is the one that is related to skill deficiencies, which is number two, the analysis shows that the respondents agreed that the students of the technical college are skills deficient.

The concept of triangulation of both the qualitative and the quantitative methods were discussed on figure 4.6.1. The research strategy and findings reflect the effect of triangulation of both methods in that they, show that the methods addressed the same phenomenon and some findings from both methods were similar e.g. that students of technical colleges were skills deficient in some courses. Both methods identified that there is need for more resources to include modern equipment, well trained teachers in order to improve TVE. The qualitative and the quantitative methods both recommended the review of the curriculum guiding the programme in order to close the skills gap that exists.

Interestingly, this finding is similar to what past researchers found about the graduates of technical colleges, that the existing workforce are deficient in some skills, skills needs to be changed and improved to meet the current demand and expectation of the industry and clients,and that the skills acquired by these set of graduates are inadequate to meet the business objectives of the industry (Tether et al, 2005; Horgarth & Wilson, 2001; Giles et al,2004; Odusami *et al*., 2003; Oloyede *et al*., 2010; Olusegun and Micheal, 2011; Tundunwada, 1981; Olomolaiye and Ogunlana, 1989; Awe, 2007; Muya et al., 2006; Jayaram & Engmann , 2017; Oketch, 2007; Olaitan et al., 2006). The major findings of this study showed that even though these set of students are still deficient in some skills, this does not debar them from being employed for suitable position applied for in companies nor that the employers found their overall performance un-satisfactory. This is an evidence to show that their practical and technical skills are satisfactory.

In the same vein, during the focus group discussion a question was raised to discuss *''How well does the current curriculum guiding electrical installation program satisfy the skills demand by construction companies''?*The qualitative analysis shows that the curriculum guiding the programme is not satisfying

the skills demand of the industry. The analysis shows that the curriculum is out of date and is not in conformity with the requirements of the industry. Moreover, there are no equipment's and tools to teach the students the required skills meant for employment. One of the instructors said *''that what is the benefit of a curriculum that incorporates all the skills demanded by the industry, and there are no equipment's, tools and equipment to teach or disseminate the appropriate teaching to the student. It amounts to not satisfying the skills demand of the industry.'' (FG participant 3)*

Another electrical installation instructor said *''in my own opinion, I will say the curriculum has all that is required in terms of skills needed. My question is that are the skills teachable? Are the skills relevant to industry need? Is the curriculum not outdated? All the answers to these questions is what's needed to be deliberated upon.'' (FG participant 5)*

These are the responses from different electrical installation instructors, this stands as an evidence that the skilled acquired by these set of graduates truly, are not sufficient and enough for gaining employment into the industry. Though, the two respondents here, hold different views about the curriculum guiding the program, one is of the view that the curriculum is adequate but the teaching resources are not available for teaching skills needed for employment and the other respondent complained, that the curriculum is out of date and has not been reviewed for the past ten years, it needs to be reviewed. This finding is in consonance with the literature review in area of lack of educational training programmes that are adequate in curriculum, and non-availability of modern tools and equipment for vocational training (Nicoleau & Sackman, 2017; Ede, 2013; Femi, 2014)

7.7 Measurement of skills gap in the quality of TVE college electrical installation graduates

Forty-two skills have been identified for college electrical installation graduates, for measuring where skills gap exist. In carrying out the skills gap analysis for the 42 skills, each skill is attached to the identified thirteen higher

level skill. The findings from the study shows that the 42 skills listed for measurement have some measures of gap as none yielded a mean score of 5.00. The findings show 16 skills with deficiencies or skills gap up to 1.5 (-1.5) on the Likert scale used. The specific skills showing deficiencies are shown on table 6.24 where the result of a one-sample t-test was carried out. The 16 afore mentioned skills show some perceived shortfall but not a very large gap.

Table 6.24 further shows that the remaining 26 areas yielded mean scores around 4.00 out of the maximum obtainable mean score of 5.00 indicating moderate skills gap of minus 1(-1) on the scale. This shows that there is a deficiency of up to 26.8% in the skills measured.

These findings shows sixteen skills in which these set of graduates were deficient, this is similar to most of what the review of literature had previously identifiedthat, skill and education offered to these set of students are not adequate for the demand of the job in the current economy, and that employers show dissatisfaction to efforts level and work attitudes of young technical graduates. Similarly, the introduction of new technology has greatly affected the performance of these graduates due to out-of-date training they had previously acquired which is not adequate and creating skills gap(Odusami*et al*., 2003; Oloyede*et al*., 2010; Olusegun and Micheal, 2011;Tundunwada, 1981; Olomolaiyeand Ogunlana, 1989; Awe, 2007; Muya et al., 2006; Jayaram &Engmann , 2017; Oketch, 2007; Olaitan et al., 2006) the findings shows and supported that the skills and education acquired shows deficiencies that will surely affect the industry and the employers.

During the review of the literature, it was discovered that the deficiency on the part of the skilled workers, their inadequate experience and absence of specialization had contributed to low level of productivity, restraining business growth both in terms of their productivity, work quality, overall organisational profit and project duration ((Durdyev&Mbachu, 2011; Ruchi, 2012; Alinaitwe et al, 2007; Kuroshi& Lawal, 2014).

Contrary to the findings of Ogwo and Oranu(2006) Awe *et al*(2010) that the graduates of technical college not possessing the adequate practical and technical skills needed for employment.This study identified that the graduates are majorly deficient in interpersonal skills, though with minor gaps in otheridentified skills. Thisdepends on when and wherethe research is conducted, there has been variations in the skills identified by each researcher carrying out the study at different times.

7.8 Respondent's disposition towards engagement with educational institutions

Research objective 3 clearly highlight that a framework should be designed to examine the curriculum of TVE with a view to map the curriculum with the gap. It is clearly evident that gaps exist between the requirements of industry and the skill levels of technical college graduates in some skills in which the graduates show deficiencies, this calls for improvement. In the questionnaire survey, five options were given to the respondents to react to, in the quantitative analysis it is evident that all the five options yielded mean scores of 3.79 and 3.80, this is an indication that the respondents tend towards agree which signify that partnership and having collaboration between the technical institutions and electrical installation companies would be beneficial. These would ensure technical college graduates match industry needs as well as help in internship and industrial attachments.

The quantitative analysis shows that there was communication gap between the industry and the TVE colleges because the mean score is 2.73 which is below 3.50, this shows that the colleges are not communicating with the electrical companies. It equally shows from the analysis that the industry does not receive invitation from the college during curriculum development, and invariably in the area of employment it is shown that the industry receives invitation for recruitment of the college graduates.

The implications of the finding are that in situations where the mean score is more than 3.50, it is evident that industry coming into partnership with the

institutions will help institutions to know what is required of them in area of skills, in other to redesign their curriculum to satisfy industry needs. Where the mean score is below 3.50 in situation like communication this shows that the institutions are not communicating with the industry, this will debar the institutions from knowing the requirements of the industry thereby causing an adverse effect on their graduates.

7.9 Validation of Research Findings

This section of the research discusses the validation of the research findings and questionnaire for 'Skills gap assessment to enhance the delivery of technical and vocational education: A case study of electrical installation graduates in Nigeria.

Having compiled the summary of the findings, and the questionnaire being drawn, there is a need for to test its validity before it could be widely disseminated to the public and the end users. The purpose or aim of the validation process is to determine whether the research findings are found helpful to improve the curriculum of the technical college electrical installation students and to establish whether these findings and recommendations are reliable. It is important to validate a research because it reveals the potential objectivity and reliability of the research. Furthermore, validation provides a solid background against which the research findings could be generalised.

7.9.1 Definition of Validation

The concept validation has been defined by different researchers and authors in different ways to mean same. Validation has been defined by Kennedy et al (2005) as a process whereby confidence is increased in the research findings, models or framework which makes it more useable. Winter (2000) argues that there is no unique way to define ''validation'' but it is majorly grounded in the process and intentions of a project and its methodologies. Validity determines whether the research measures what it truly purports to measure or how truthful the research results are in the context of the study (Golafshani, 2003).

The meaning of validation has different meanings in different levels of the research process especially the conceptual, methodological and empirical stages of the research (Brinberg and McGrath, 1985). The effectiveness, internal consistency, testability and adaptability could be established in the conceptual stage during validation process, while in the methodological stage it would be expected that efficiency and explicitness would manifest. In the empirical domain, it is expected that the research would be beneficial or relevant in terms of any potential practical application. Validity have been described by various authors and researchers in qualitative research. There is no definite way to describe the content validity, but it is ''majorly grounded in the process and of a particular project and its methodologies'' (Golafshani, 2003). Furthermore, some qualitative researchers have criticised and argued that validity is a concept that is not applicable to qualitative research, meanwhile, there is need for measure for their research and kind of check to affirm whether it measures what is supposed measure (Golafshani, 2003).

The quality of a qualitative research is measured by the validity of the findings of the research (Egbu, 2007). In validating a research project, three major areas should be critically assessed and a possible methodology for assessment is for the researcher in striving towards value, and robustness. Value deals with the worthiness of the research, while correspondence is the degree at which the features of the relations in the various stages fit together. External validity is done through the consistency of the empirical findings through replication and convergence. There are different kinds of validity ranging from internal validity, external validity, construct validity, content validity and some other types of validity. The two major ones are that are commonly used in research are the external and internal techniques (Ahadzie, 2007; Ankrah, 2007; Egbu, 2007).

7.9.2 Selection of the Participants

There are four options that was considered for carrying out the validation. (i) focus groups (ii) interviews (iii) postal surveys and (iv) e-mails. The first three options were not considered due to the time and cost constraints, leaving the e-mail as the fastest and most appropriate option in carrying out the validation. Problems associated postal surveys such as the restrictive nature of the questionnaire and lack of opportunity to clarify respondents' doubts were overcome by carefully designing the research feedback form inform of questionnaire comprising seven 5-point Likert type questionnaire and a six-page summary of the findings of the research to clarify any misunderstandings the respondents may have had. As an ethnography research, it was important to validate the findings with the focus group members who are the heads of electrical installation department in technical colleges in Nigeria, to determine if the findings were valid, useful and helpful in improving the curriculum, likewise, if the recommendations were useful, based on their experiences.

By this reason, a covering letter was sent to ten participants of whom were initially selected among the focus group interviewee for the purpose of the research, requesting their kind assistance in the validation exercise and restating the purpose of the research. A questionnaire with the summary of the findings was sent and instructions on what was expected of them for the validation process. This was sent out via participant e-mail addresses and reminders were also made over the telephone. The use of the previous participants is based on their prior involvement in their earlier focus group interview which makes them familiar with the research and would ensure a good response rate. The validity of a research is based upon those that were initially part of the research and who can verify to the findings of the study (Silverman, 2006). The process of carrying out this validation is known as respondent validation (Silverman, 2006). The next section, therefore, describes the validation process and the conclusions drawn from the findings. This would also help to predict if the usefulness of the research outcome was about or above average.

7.9.3 Method Adopted for Validation

Only one method was adopted for the validation exercise for this research which was the application of external validation. The main reason for carrying out external validation is to gain confidence in the findings and what was meant in terms of what is supposed to measure during validation process (Brinberg& McGrath, 1985). The main interest lies in ensuring the robustness of the research findings (Fellows and Liu, 2007). It has been assumed that qualitative research lacks generalisability which is incorrect. Qualitative research is conducted in order to generalise the findings where the researcher depends on its own result to other theories (Healy & Perry, 2000).

External validity was achieved in this study by comparing the findings with similar findings from previous studies from (Jayaram &Engmann, 2017). The sample size used for this validation exercise is relatively small, the feedback received is generally encouraging and suggests that the research findings and recommendations have the potential of being well received. The outcomes suggest that the findings and recommendations are useful in terms of improving the curriculum. The feedback also creates assurance that the developed frameworks for the measurement of skills gap and for mapping the curriculum with the gap could assist the instructors, stakeholders and curriculum developers/designers in developing a curriculum that will match the industry requirements in terms of skills needed in industries.

The summary of the result that were obtained from the participants who responded to the questionnaire were displayed in the next table. Truly, results from the questionnaire and some of the positive recommendations made by a number of the participants acknowledged that both frameworks are helpful and useful in measuring skills gap and in mapping the curriculum with the gap and equally serve as a detailed guide for the stakeholders both in schools and industries.

7.9.4 Participants' Response

Out of the 10 heads of department in electrical installation practise who were sent questionnaires for validation, 8 responded, and they all participated in the first focus group interview, so they have the knowledge and experience concerning the validation issue. The two that was not responding was followed up with phone calls but all to no avail.

The data was analysed using SPSS 26.0 to determine the frequency and percentage to which respondent at least agreed to the research outcome. The majority of the participants were in favour of the outcome, indicating the frameworks to be a positive contribution to the further development of Skills gap Assessment. In addition, some off the respondents provided their comments about the framework which has been added in this chapter. All the results received were positive as shown in the table below.

Table 7-1: Validation of research findings from focus group comprising eight electrical instructors

Item Questions	**Not important**	**Slightly important**	**Moderately important**	**Important**	**Very important**
1. How important are the findings help in curriculum design of your programme of study?	0(0%)	0(0%)	0(0%)	2(25%)	6(75%)
2. How important are the findings in diagnosing skills deficiency in programme curriculum?	0(0%)	0(0%)	0(0%)	2(25%)	6(75%)
	Not Helpful	Slightly Helpful	Moderately Helpful	Helpful	Very Helpful
3. How helpful are the findings in including industry experts/professionals in curriculum design?	0(0%)	0(0%)	0(0%)	4(50%)	4(50%)
4. How helpful are the findings in enabling educators/instructors prepare their graduates to meet employers/industry need?	0(%)	0(0%)	0(0%)	3(37.5%)	5(62.5%)
5. How helpful are the findings in tackling the deficiencies in high- and low-level skills?	0(0%)	0(0%)	0(0%)	6(75%)	2(25%)
	Not useful	Slightly useful	Moderately useful	Useful	Very Useful
6. How useful are the findings in suggesting improvement of skills development?	0(0%)	0(0%)	0(0%)	1(12.5%)	7(87.5%)

7. How useful are the findings in developing a framework for the measurement of skills gap?	0(0%)	0(%)	0(0%	3(37.5%)	5(62.5%)

7.10 Suggestions for improving quality of technical college graduates

The questionnaire surveyinvestigated six ways to improve the quality of technical college graduates to include, review of the entire curriculum guiding their study, providing the modern equipment and tools in the workshop, having collaboration with industry and companies in drawing curriculum, to encourage the students with loans and scholarship to learn and to improve the standard of library and ICT facilities. All these suggestions proffer solution for improving the quality of vocational technical education

The quantitative analysis revealed that the weighted average for the suggested improvement to be 4.62, which signify that the suggestions for improvement were very important to the programme of study.

The focus group interview discussed ways of improving the curriculum guiding electrical installation program in areas of technical, communication, literacy and problem-solving skills.

From the focus group one of the electrical instructors (FG participant 2) said: ''All curriculum experts including the labour market, society, industries and the subject teachers should come together and look into the needs of the society and make changes periodically within 3years such that there could be changes in the performance of their graduates.'' This is in conformity with the recommendation of the quantitative findings in area of collaboration.

Another instructor (FG participant 6) said*: ''This is relevant to improving the curriculum as a whole, in improving the curriculum, curriculum experts from electrical installation programme should be invited to a workshop, with other curriculum experts to see where there are deficiencies and make recommendations as expected''.*

However, this finding is similar to what literature revealed aboutlack of educational training programmes that are appropriate in curriculum content and adequate in quality facilities meant for training (Oketch, 2007; Awe, 2007; Olaitan *et al., 2006*)which has contributed greatly to skills gap in Nigeria. It is generally acknowledged that the curriculum of secondary education in many countries has remained unchanged for many years (Namuddu et al., 2017). This means that the curriculum must be reviewed periodically such that the instructors will be able to teach skills that are relevant and current to the need of the industry.

This means that the curriculum is not adequate in content and adequate in quality. Curriculum review is necessary to go with the trend of work in industry as the old ones are so obsolete and not current for the immediate use. In reviewing the literature, it was noted that in order to prevent skills gap that is prevalent among the graduates of technical college, Germany and Japanese companies work hand in glove with the local schools and state officials, developing curriculum to suit the companies need (Zwick, 2007).

In general, the qualitative and quantitative findings indicated that, in improving the status of the technical college graduates, the curriculum must be reviewed, the issue of collaboration of experts in the field and provision of adequate facilities will help improve the quality of technical college graduates produced. Rojewski conceptual framework for career technical education in section 3.15 was adopted for this study and itentails five components, which required in any school system. These five components form the bases of teaching and learning, from the school perspectives in figure 3.6, which is the framework for mapping the curriculum with the gap. The curriculum was broken down into contents with the required subjects and skills acquired from the school system.The industry request for employability skills, which is amalgamation of different skills, the difference between the required skills from the industry and the acquired skills from the school is the skills gap explained in figure 3.6 of this study.

7.11 Summary of the Chapter

This chapter have compared the findings of the qualitative and quantitative with the literature in other to bring out the comparative and the differences out from the findings. In the qualitative analysis the instructors show understanding of the curriculum, they agreed that the curriculum needs to be re-design and updated in other to meet the need of the companies, due to the out-of-date curriculum, this has caused some skills gap among the technical college graduates. The other factor that has contributed to the issue of skills gap found wanting in technical college graduates is the lack of materials and equipment's which all were identified from the literature review

The quantitative aspect of the research was set out to identify how the employers perceive technical college graduates' skills and abilities in the workplace. Moderate gaps were found among the desirable skills needed by the companies. Gaps were also found in the skills gap analysis conducted on the top/low level skills, rating of graduate demonstration, skill acquisition and importance of skills needed in the companies, these skills had already been identified in literature review.

Overall, the discussion shows that the curriculum guiding the program needs to be updated and re-design to suit the companies need in areas of desirable and essential skills needed by the companies.

CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

This chapter presents the entire summary of the research. It presents the conclusions and recommendations of the study, the limitations of the research, and contributions to knowledge. The study has explored skills gap within electrical installation program in technical and Vocational Education programme in Ogun and Kaduna states in Nigeria. The chapter is aimed at summarising the research and is divided into eight sections. The first section providesthe summary of the research. Discussions based on the fulfilment of the research aim and research questions are in third section. The fourth section provides the key contributions of the research in three main aspects: Knowledge, method and practice. Insights into barriers to effective ways of bridging skills gap are discussed is in the fifth section. The sixth section provides partnership framework for bridging the skills gap between industry and school and limitations of the research are presented in the seventh section, while the eighth section provides the limitations to the research. Finally, a summary which concludes the chapter is presented in the ninth section.

8.2 Summary of the research

The issue of skills gap has always been a re-occurrence issue since ages. The industries and companies have been facing alot of challenges due to the problems caused by the skilled workforce, in that the industry experience that there is difference between the skills needed for a job versus those skills possessed by the prospective worker. Moreover, complaints of skill deficiencies on part of these set of skilled workforces affected and jeopardized the productivity, failure to meet deadlines and lower product quality of the industry, and moreover, employers cannot find the qualified workers they need and even caused unemployment on the side of these set of graduates, this prompted the initiation of this study.

In a developing country like Nigeria, the issue of skills gap is still under researched and is affecting the industry greatly, some of the causes include, the demand for multi-skill approach, demand for new skills, lack of educational training amongst others as identified in chapter two of this thesis. In Nigeria, efforts have not been made to solve the issue or deliberate on issue of skills gap among the workforce. However, the findings of this research have provided a comprehensive report on the case of Nigeria with specific emphasis on particular zone the north and southern part of Nigeria. In this research, efforts were made to identify factors causing skills gap in Nigeria. Evidence shows that truly skills gap exist, what skills are needed by the industry and employers, factors causing skills gap were discussed among others. These issues were sorted out through the survey (questionnaire) and the focus group interview conducted. Based on the foregoing the following questions have guided the research:

1 What are the desirable skills that are in demand by the industry?

2 What methods will be adopted in measuring the skills gap?

3 How does the curriculum of vocational education in area of electrical installation satisfy the skills demand of the construction industry in terms of graduate students performing professional duties and responsibilities as needed?

While the literature presents the background of skills gap, skills gap among the craft workers in Nigeria, skill and skills gap in the construction industry identifying skills needed, evidence of skills gap in Nigeria and factors causing skills gap. Importantly, no studies have examined skills gap issues from a Nigeria construction perspective and its contextual environment. Understanding these environments remains pertinent in addressing the skills gap issues in developing countries.

8.3 Addressing aims and research objectives

The aim of this research is to create a measuring and mapping framework to address the construction skills gap through improved technical and vocational education with particular reference to the challenges inherent in the Nigerian Electrical installation programme. This led to developing a partnership framework for bridging the skills gap between industry and school.

Objective 1: To understand the theoretical underpinning and state-of-the-art practice in identification of skills gap in academic, generic, technical, practical and employability skills required for employment in construction industry.

This objective is addressed in chapter 2, providing a platform for the study on skills gap. The literature review has revealed the issue of skills gap generally, as not a new phenomenon but as a worldwide issue. The effect of skills gap has been hampering the development of a nation in terms of GDP, and a global challenge that threatens global economic growth. The side effect of these makes the industry suffers severe skilled shortages which affects the production output of the industry and the business performance.

The literature review revealed the definition of skill and skills gap within all industries ranging from construction to manufacturing among others that employed skilled workforce. Knowing fully that skills gap exists within the skilled workforce, it is the difference between what the industry required and what the employee possessed. This review highlights that skills gap exist among the developed countries likewise, in combating the skills gap, Germany has taken measure in introducing the dual apprenticeship model in resolving the challenges faced due to skills gap and it has been adopted by other developed countries.

The literature review revealed that evidences has shown that skills gap exist within the skilled workforce in Nigeria, and technical and vocational education and training as (TVET) has been found as an instrument used in tackling the problems of skills gap. Factors causing skills gap were equally revealed in the

literature to be a lack of educational training, rapid change in technology, demand for new skills and demand for multi-skill approach among others.

The literature review identified and established that employers in the construction industry are looking for skilled workers with right employability skills. Skills identified to be of importance by the construction industry include academic, generic skills, technical and soft skills among others.

Objective 2: To develop a framework for the measurement of skills gap in industry. A framework for the measurement of skills gap was developed, using a quantitative approach which will enable a comprehensive product activity for measuring skills gap to be communicated to stakeholders.

Addressed in chapter 6, this objective is based on skills identified in objective 1 to partly make a case for the study, but more importantly, to demonstrate the state-of-the-art practice in identification of skills gap in identified skills. The review of the literature identified skills required for employment, which include 13 high level skills. The same framework used for skills gap analysis in the high-level skills is adopted for the 42 skills identified for electrical installation craft men.This framework gives a clearer picture of how skills gap analysis could be conducted and how it could be measured in any industry, most especially the construction industry. Stakeholders could adopt and administer the framework in conducting skills gap analysis among their employees in the industry.

As a result, no studies in Nigeria have explored the construction industry from the skills gap analysis perspective. This demonstrates the gap in knowledge of the current realities in terms of measuring skills gap among the workforce, suggesting that it is poorly understood. By implication, this means that the approaches to skills gap understanding are poorly understood and empirically unverified even though the causes and implications are well understood

Objective 3: To design a framework to access the curriculum of TVE with a view to map the curriculum with the gap, this framework is illustrated in fig.

3.6. Based on the literature review the framework was designed to examine areas of skill gap in industry, to see whether the curriculum of TVE constitute the skills needed by the industry.

Mapping the Vocational Technical Education curriculum in area of electrical installation to the gap identified in the literature shows that, the curriculum is well spelt out to cover all areas of skills needed by the industry. The curriculum constitutes the skills needed by the industry. Though, the skills are embedded in the curriculum, the four major areas that constitute the curriculum is based at the centre of the framework, these are activities, portfolio work, personal detail and progress, these four components were attached each to the form of assessment carried out on students, the learning outcome, learning opportunities and the content of the programme to be taught. The content contained all the courses offered in electrical installation program, this formed the acquired skills from the college, while, the required skills are the employability and industry needs. The difference between required skills and acquired skills is the skills gap. This objective is addressed in chapter 3, section 3.15, and the framework for mapping the curriculum with the gap is on figure 3.6.

Objective 4: To collect and analyse data. Data was collected through survey research administering questionnaire technique on the respondent, and a focus group interview with the stakeholders and other respondents. Analysis was carried out via SPSS analytical tool and qualitative approach to understand the intervention needed to address the skills gap.

This objective was achieved by the researcher during the field work to Nigeria, where a survey was administered to electrical installation professionals in the construction industry from the northern and southern parts of Nigeria and a focus group discussion was carried out among the electrical installation instructors from various technical colleges. This objective is addressed in chapters 5 and 6. The research questions shows that both qualitative and quantitative methods would be adequate for addressing the research

questions and objectives. In doing this, the interview guide was developed based on the literature review, opinion of the researcher and views of the industry. Before this, the data collection instrument was checked to be sure that it is useable. This require interview questions align with research questions and it was pilot tested on some group of electrical installation experts before use. Based on the feedback from pilot study the interview guide and the questionnaire were revised and corrected. The analysis was carried out both on the quantitative and qualitative data collected using SPSS for the quantitative and thematic analysis for the focus group interview. The findings for the study emanated from the analysis carried out, and areas of deficiency was clearly seen and noted for correction. The findings of the study verified and established that the graduates of electrical installation in technical colleges in Nigeria, are truly deficient is some of the skills tested, both from the higher-level skills to the low-level skills.

The qualitative analysis was carried out using focus group discussion. In totality six focus group discussion was arranged, three groups in each northern and southern regions of Nigeria. Each group comprising between 6-8 participants. Each of the interview was facilitated by the student researcher. Participants were asked to participate in the discussion they were asked to identify and discuss the specific issues and challenges affecting the programme curriculum. The focus group questionnaire was administered with each group, the discussion was tape recorded and well written on paper. The theme and sub-theme that emerge from the discussion was thematically analysed. The main findings of the focus group data analysis show that the curriculum needs to be updated and re-design. The instructors complained about not been involved in curriculum development and lack of materials and equipment's for training practice purposes in workshops.

The quantitative analysis was carried out using self–administered questionnaires on the respondents. The questionnaire was administered to construction industry experts, 360 questionnaires were generated while, 261 responded. The main reason for administering this questionnaire with the

stakeholders is to explore their points of view regarding skills gap and to identify the desirable/essential skills that are in demand by the industry and, assess the level of competence of graduates of technical college in areas of electrical practice. Skills identified were all analysed using descriptive and inferential statistics. The findings of the quantitative shows that technical college students are deficient in some skills necessary for employment. In particular, the quantitative findings strongly reflect the deficiency of electrical installation graduates in soft skills, which contradicts the initial findings of past researchers who emphasized the graduate's deficiency on practical and technical skills.

Objective 5: To validate findings. The result from this research was validated from stakeholders' perspectives. The stakeholders evaluate the utility and sustainability of both the measuring and mapping framework to ascertain that the findings truly represent the phenomenon claiming to measure and map out in the research.

The summary of findings for this study was given out to the heads of electrical installation department in Nigeria to evaluate whether the findings are found useful and helpful in helping to improve the curriculum.

Objective 6: Draw conclusions and make recommendations to address the important gaps within the technical grades in the construction industry.

Based on the validation, if truly the phenomenon measures and maps out what is supposed to measure and map out, then conclusions and suggestions may be proffered, based on the findings of quantitative and the qualitative findings.

8.4 Recommendations for improving skills gap deficiencies in electrical installation programme in Ogun and Kaduna states in Nigeria

This research sets out to investigate skills gap assessment to enhance the delivery of technical and vocational education: A case study of electrical installation graduates in Ogun and Kaduna states inNigeria. Following the key findings, and in consonance with the researchers aim and objectives, the following recommendations are proffered:

8.4.1 Electrical installation skills improvement

There is need to reconsider the educational system within the TVET in Nigeria, which presently is more of theory than practice, therefore the requirements of the industry, prospective stakeholders, and the society at large should be matched with the skills acquired in other to satisfy the labour market and the employers. Therefore, there is urgent need to make sure that policies regarding interpersonal skills and other skills needed by the industry is provided by the technical institutions in Nigeria. During the analysis, it was noted that electrical installation graduates were deficient in some of the skills required for employment, invariably the students had an awareness and knowledge of electrical installation, but still they are found deficient in interpersonal skills and few related employability skills. Thirteen high level skills were identified to be desirable, namely thinking ability, comprehension ability, reading skills, written communication skills, speaking and listening skills, leadership skills, negotiation skills, time management skills, problem solving ability, interpersonal skills, core skills for learning, technical skills and job readiness skills. Out of these, the quantitative findings of this research highlight seven out of the thirteen skills where students are found to be deficient. Out of forty-two skills in the low-level skills, sixteen skills show deficiencies. Therefore, the institutions should look into ways of improving the skills where the students are found wanting by making provision for teaching staff, facilities and equipment's for training. It is better to survey students regularly to know their electrical installation skills level and future

training needs. This research found that there was a recognised need among the construction industry skills need, which needs to be addressed by the TVET institutions in Nigeria.

8.4.2 Curriculum review

Currently, there is a need for electrical installation curriculum review, with a view to make training more relevant to the needs of the construction industry, stakeholders and the society at large. In other to do this effectively, a review of the present curriculum is paramount if VTE will not fail in their objectives as it was stated in the National policy of education, that is, provision of manpower in all areas of construction industry. It would be better and useful to identify the defects and seek the opinion of current students, employers and policymakers, to know the way forward. Curriculum experts, reviewers and curriculum development committee should be invited to have deliberations on how to review the present curriculum to suit the employers and the stakeholders. The findings in this research, highlighted that curriculum guiding TVET in Nigeria has not been reviewed in the last ten years, which is not appropriate and even the review was carried out by non-experts in the field. However, the NBTE, NABTEB and WAEC technical should come together to set up group of experts in electrical installation to set minimum standards, another group of experts should do the follow up and see the extent to which these standards set are met.

This research agreed to some 'extent' that the existing curricula adequately prepared students for future employments and that the curricula of vocational education in area of electrical installation did not satisfy the skills demand of the construction industry in terms of graduate students performing professional duties and responsibilities as needed. There are deficiencies cited that are affecting the curriculum during the focus group interview to include lack of textbooks, inadequate tools and equipment's and exposure to practical's due to lack of tools and materials which makes the curricula to be in- effective.

Electrical installation programme should be restructured to satisfy the deficiency in interpersonal skills so that there are more training hours dedicated to it

8.4.3 Partnership and collaborations between TVET institutions and Industry

There is need to strengthen the existing loose partnership between the industry and TVET institutions to deliberate on the skills need of the industry and, where industry can come in the area of assistance to the schools in terms of finance, drawing of the curriculum, and the students' internship programme. Technical and Vocational education and training (TVET) should come together with the industry, to have a dialogue on what are the needs and requirements of the industry in terms of skills needed and to discuss the issue of curriculum guiding VTE, such that the inadequacies on part of the institutions would be reversed and corrected. There should be exchange programme between industry and TVET institutions for effective TVET outcomes that meet industry's needs and needs of individuals for self-employment and improved productivity. This exchange programme will bridge the skills gap identified in this study as well as acquaint the graduates of technical colleges with the present needs and expectation of the construction industry.

8.4.4 Federal Government and stakeholders to finance TVET in Nigeria

During the focus group interview, the participants stressed that lack of adequate funds on the part of the Federal government of Nigeria had constituted to the failure of TVET institutions in preparing their graduates to meet the requirements and needs of the industry. Federal government and stakeholders should gear up in providing adequate funding for TVET institutions in Nigeria. The effects of adequate funding are numerous to include boosting standards and quality of the skilled workforce, provision of instructional resources and infrastructural resources in vocational and technical institutions in Nigeria. National board for technical education (NBTE) and (NABTEB) should contact the federal government on behalf of the technical institutions in the country, so that the federal government can

earmark adequate funding for TVET institutions so that there will be adequate tools andequipment's and current textbooks for use.

8.4.5 Introducing refresher course for Electrical Installation Instructors

Part of the sub-theme that was raised during the focus group discussion is the training of the unqualified instructors in technical teachers training programme, therefore, the government should set a budget for training the instructors and electrical installation instructors, some instructors are not well grounded in their discipline both in theory and practice, which by extension is impacting on the quality of graduates produced. The government should allow instructors to attend a refresher course regularly, so as to update themselves in their various disciplines. TVET providers both public and private should provide incentives during the course and even a special salary scale that will attract high quality trainers both locally and from abroad.

8.4.6 Provision of modern equipment's and tools

This was discussed during the focus group interview, when instructors deliberated and discussed the issue of outdated equipment's and tools which had an impact on skill performance of the students and that the curriculum guiding the programmeof vocational education in area of electrical installation did not satisfy the skills demand of the construction industry in terms of graduate students performing professional duties and responsibilities as needed, this is caused by the out of date equipment and tools contributed to the skills deficiency on part of the students.

8.5Research Contributions

This section of the chapter presents the contributions of this research to knowledge, to methodology and to policy and practice.

8.5. 1 Contributions to the General Body of Knowledge

This research has contributed to the existing body of literature and the field of TVET by identifying the inadequacies of previous studies regarding skills gap issues in developing countries, with particular emphasis on Nigeria. The

research has empirically identified key factors affecting causes, effects and evidence that skills gap exists among the skilled workforce in the construction industry in Nigeria.

No previous study had empirically considered how skills gap affect the construction industry in Nigeria or have mapped the curriculum with the identified gap. There is lack of scholarly articles in the area of skills gap assessment among TVET experts in Nigeria. Therefore, this study adds to the existing body of literature and make specific contributions to the field of TVET by providing insights to the effect, causes, evidences and factors causing skills gap among the construction skilled workforce in Nigeria. It was observed that no previous research had put forward success strategies or a guide for resolving the various issues facing Nigerian construction industry with respect to skills gap assessment for their skilled workforce. Hence, this research is considered as one of the pioneer studies in this area, as the study has put together success strategies inform of a framework that can assist Nigerian construction industry, stakeholders, policy makers, electrical installation supervisors and TVET institutions to resolve issues on skills gap assessment.

This research provides a unique insight by developing a framework for the measurement of skills gap in industry. This framework was developed by using a quantitative approach which enable a comprehensive product activity for measuring skills gap to be communicated to the stakeholders. The framework has been developed in this research can be applied by other researchers considering similar areas of skills gap assessment. Besides, the feedback from the validation process indicates that the framework would not only assist construction industry and TVET institutions in Nigeria but can help developing and developedcountries as a whole, since issues relating to skills gap isworldwide.

This research contributes to knowledge by validating the findings which comprise the factors hampering the TVET institutions in areas causing skills gap among skilled workforce working in industry, as validation helps the policy makers in improving the curriculum.

This research makes a substantial contribution by illustrating a framework, to assess the curriculum of TVE with a view to map the curriculum with the gap. The literature review revealed the area of skills gap in industry, the mapping procedure exposes whether the curriculum of electrical installation constitute the skills needed by the industry. This mapping framework could also be applied by other researchers in the field of TVET.

8.5.2 Methodological Contributions

The research makes a methodological contribution by using different data collection methods referred to as mixed methods and triangulation, to assist in increasing the validity of the research findings. Many studies that have examined the issue of skills gap in developing countries in the past have focussed on a single data collection, some quantitative only, while some adopted qualitative method alone. However, this study used both methods in addressing issues relating to skills gap assessment in Nigeria.

The methodological contributions of this research not only include triangulation as previously fully discussed in figure 4.6.1 and figure 7.6, but also used an exploratory case study research strategy. The use of this strategy was found to be very useful in providing a clear understanding of the process of skills gap assessment in the Nigerian construction industry. The strategy also enabled the researcher to recognise key issues surrounding the process. Furthermore, the research made use of triangulated data involving focus group interviews, survey using questionnaires whilst secondary sources of evidence comprised mainly journals, conference papers and textbooks. Triangulation provides several advantages that help overcome the problems associated with using a single data collection method.

Methodologically, the research employed mixed methods, comprising of both qualitative and quantitative approaches in order to provide in-depth information about the subject, and equally developed understanding of the level of detail in skills gap assessment needed to inform curriculum design.

8.5.3Practical Contributions

The research has contributed to both educational policy, practice and the industry by providing insight into the causes, effect and how to remedy the effect of skills gap on industry and the skilled workforce. The curriculum guiding the programme would benefit from being restructured because of the practical implications it will have on the graduates of the institution. This is evident, based on the different views of the individual participants who participated in the research.

This research has offered suggestions on how the Nigerian government, the industry, NABTEB, NBTE can support vocational technical education in terms of finance, resource persons, curriculum development and host of other needs that will make TVET functional. This would make the electrical installation educators make informed decisions. Policy makers can use the frameworks as a steppingstone to improve TVET in Nigeria. Electrical installation instructors, curriculum developers can draw on the findings of the study for curricula development.

8.6 Research Limitations

There can be no research without limitations. As is the case with other studies, this research has a number of limitations that needs to be addressed, as discussed below.

- The research covers only two zones out of six though, the results are quite similar, had it been the research covers the whole Nigeria, this can reveal further insights beyond what is discovered by this research. The other four zones will be recommended for further studies.
- Recruiting participants from the electrical installation instructors for the focus group interview was a challenge, as some considered the topic to be sensitive. Some refused to take part in the study, though the sample interviewed was adequate representation of the population. They exercise fear that they would be exposed despite the

assurance of anonymity. Future research might consider the use of one-on-one interviews to overcome this.

- The skills gap perception was based on employed TVET graduates. It does not address either the quantitative shortfall of technical graduates or the TVET graduates that were considered unemployable. This was because of the goal of improving TVET programmes. Further research may address quantity of trained graduates and also students not performing against current curriculum.
- In some cases, participants in the focus group discussion refused to speak against their organisations. Just like other qualitative studies, it is hard to tell if the responses of the respondents are a true reflection of what happens in their organisations, however, the focus groups approach enabled good discussion and clarification of the issues.
- Qualitative research is not allowing the measurement of the examined problems.
- The findings of the quantitative research will be based on the professional judgement of skills gap that is prevalent among the technical college graduates and as such one could argue that the findings may not be a true reflection of the problem at hand, this is social desirability in context.
- The research focused on TVET and not on any alternative methods of training for electrical installation skills. This was because the industry prefer formal and apprenticeship form of training and it should be noted that the industry favoured electrical installation skills.

8.7 Recommendations for Further Research

The findings of this research and the research limitations have resulted in the identification of potential future research directions for investigation. The recommendations for further researchas a result of this study are indicated below

- Surveying other different organisations different from construction industry, like manufacturing, pharmaceuticals and that were not included in this research, from the public and private sector to know their skills need. Other industries are likely to face the problem of skilled personnel.
- This type of research could be conducted among other construction trades e.g. plumbing, block laying welding, and host of others.
- The research to be replicated all over Nigeria, to see whether the findings varies
- This study needs to be repeated in future. In order to evaluate changes made, if any, and what needs to be done to overcome issues and problems faced
- More research is needed to further validate the findings, in order to increase the generalisation of the results in different zones within Nigeria. Re-testing the research findings and the recommendations in different zones within Nigeria especially, will help to determine whether the findings have the same impact or are less significant in otherareas.
- The measurement framework and the mapping framework should be validated in different contexts to extend generalisability and contribution of the framework. Also, there could be further investigations that can extend the framework as new factors could emerge after some time. From the review of the literature, it appears that no existing research had examined the effect of skills gap on the industry and the employees. It will be useful to conduct further research in this area.
- Issue of skills gap in this study is based on demand and supply variables. The focus of this research is to investigate skills gap assessment among electrical installation graduates in Ogun and Kaduna states of Nigeria. It was well documented by past researchers that electrical installation graduates lack skills required for

employment in industries, this prompted the researcher to investigate the issue and to make recommendations. On demand side issue of the skills gap is the continuous professional development of the graduates after being employed into the industry in order to keep their skills updated and relevant with changes in the industry and the introduction of newer technologies. This issue was not investigated and therefore more research is needed to reflect its emphasis on investigating more of the supply side variable of skills gap.

8.8 Summary of the Chapter

It is expected that future research will extend knowledge of skills gap assessment in other zones in Nigeria beyond the area covered by this research. Insights from the investigation suggest that skills gap exist among the skilled workforce produced by TVET institutions and, that the curriculum guiding the programme do not satisfy the skills demand of the industry in terms of professionals performing their duties as expected of them.

It is expected that the findings obtained in this study would be beneficial in providing some necessary guidance for TVET institutions in Nigeria and developed countries. This research has fulfilled its aim and objectives and has answered all research questions set out at the beginning of the study.

This chapter has presented the contributions of this research to the body of knowledge which include the developed framework, the research methods adopted for the study and how they were applied, key limitations as well as recommendations for future research. The research findings could be useful to TVET institutions, technical and vocational instructors, researchers, industry and policy makers.

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APPENDIX A-1:FOCUS GROUP INTERVIEW SCHEDULE

UWE Bristol | University of the West of England

QUESTIONNAIRE ON SKILLS GAP AMONGST ELECTRICAL INSTALLATION TRADES IN NIGEIRA

Participant Information Sheet

Title of the study: Skills gap assessment and challenges of training the skilled labour force: A case study of Electrical Installation Graduates in Northern and Southern Part of Nigeria

I am AwonugaOlukayode Olusola, a PhD research student in the faculty of Environment and Technology (FET) at the University of the West of England in Bristol UK, undertaking research into "Skills gap assessment and challenges of training the skilled labour force: A case study of Electrical Installation Graduates in Northern and Southern Part of Nigeria**".**

The main aim of the research is to create a measuring and mapping framework to address the construction skills gap through improved technical and vocational education with reference to the challenges inherent in the Nigerian Electrical Installation Programme.

I am inviting you to take part in this research, because of broad industrial experience you have acquired in Electrical installation works and practice in Construction Company.

You are asked to complete the questionnaire, which are in four sections. **Section A** request background information. **Section B** focuses on skills acquisition and importance of skills needed by electrical installation craftsmen. **Section C** focuses on the list of different skills regarding student's abilities and measurement of skills gap. **Section D** focuses on how to improve electrical installation programme. The questionnaire will be handpicked by the research student. Only your valued expert response is requested. The questionnaire will take approximately 25mins to complete. If you choose not to participate or to withdraw your participation during the course of the research work, this will not affect you in any way, but your participation will be much appreciated.

For the purpose of individual anonymity, no personal information such as name, address, date of birth or phone number will be stored. All data collected for this research will be stored securely and only used for research purposes.

You have been supplied with a unique identifier number at the top right-hand corner of your questionnaire, the same number is on your invitation letter. Please take a note of this number which will help us to identify your questionnaire in case you want to withdraw your response. Please quote the unique identification number on your questionnaire and contact the researcher.

Please read the attached enclosed covering letter, and signed the consent form, prior to completing the enclosed questionnaire. The findings will be disseminated in academic publications by May 2018, after that you will not be able to withdraw your data.

If you have any questions, please contact the researcher or the useful contacts details below.

Please return or direct any enquiries to:

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Section A: Background Information.

Please provide the following background information. Please tick [✓] one option.

1. What is your role?

☐ Managing Director ☐ Human resource manager ☐ Electrical Installation Supervisor

2. Your years of experience in electrical installation in the construction industry.

☐ 0-5 years ☐ 6-10 years ☐ 11-15 years

☐ 16-20 years ☐ 21-25 years ☐ Over 25 years

3. Your qualifications in your current role.

☐ Trade test 2/3 C&G Intermediate

☐ WAEC Tech College Diploma.

4. In which sector does your company operate?

☐ Private

☐ Public

5. How many employees are in your organisation?

☐ 0-10 ☐ 11-50 ☐ 51-100

☐ 101 – 300 ☐ Over 300

6. In the last five years how many electrical installation operatives were recruited at your company?

☐ 1-20 ☐ 21-40

☐ 41-60 ☐ Over 60

7. How many of the above recruits were fresh graduates from Technical and Vocational Education (TVE) colleges?

☐ 1-10 ☐ 11-20 ☐ 21-30

☐ 31-40 ☐ Over 40

8. What is the minimum certificate required for work as a craft operative in your company?

☐ Trade test 2/3 ☐ C&G Intermediate ☐ WAEC Tech

☐ College Diploma ☐ Other Certificates

Section B:Skill Acquisition And Importance of Skills Needed by Electrical Installation Craftsmen

1. Please rate the importance of the following skills/competencies to carrying out the job of an electrical installation craftsman in the construction industry. Please tick [✓] the appropriate box.

Skills/ Areas of Competencies	Not important	Slightly important	Moderately important	Important	Very important
1. Thinking ability	☐	☐	☐	☐	☐
2. Comprehension ability	☐	☐	☐	☐	☐
3. Reading skills	☐	☐	☐	☐	☐
4. Written communication skills	☐	☐	☐	☐	☐
5. Speaking and listening skills	☐	☐	☐	☐	☐
6. Leadership skills	☐	☐	☐	☐	☐
7. Negotiation skills	☐	☐	☐	☐	☐
8. Time management skills	☐	☐	☐	☐	☐
9. Problem solving ability	☐	☐	☐	☐	☐
10. Interpersonal skills	☐	☐	☐	☐	☐
11. Core skills for learning	☐	☐	☐	☐	☐
12. Technical skills	☐	☐	☐	☐	☐
13. Job readiness skills	☐	☐	☐	☐	☐

2. How would you generally rate the new TVE college electrical installation graduates' demonstration of the following skills? Please tick [✓] the appropriate box.

Skills	Not at all	Poor	Fair	Good	Very good
1. Thinking ability	☐	☐	☐	☐	☐
2. Comprehension ability	☐	☐	☐	☐	☐
3. Reading skills	☐	☐	☐	☐	☐
4. Written communication skills	☐	☐	☐	☐	☐
5. Speaking and listening skills	☐	☐	☐	☐	☐
6. Leadership skills	☐	☐	☐	☐	☐
7. Negotiation skills	☐	☐	☐	☐	☐
8. Time management skills	☐	☐	☐	☐	☐
9. Problem solving ability	☐	☐	☐	☐	☐
10. Interpersonal skills	☐	☐	☐	☐	☐
11. Core skills for learning	☐	☐	☐	☐	☐
12. Technical skills	☐	☐	☐	☐	☐
13. Job readiness skills	☐	☐	☐	☐	☐

3.Please indicate your level of agreement to the following statements regarding methods of skills acquisition for TVE college electrical installation graduates. Please tick [✓] the appropriate box.

Methods of Skills Acquisition	Strongly disagree	Disagree	Neither Agree or Disagree	Agree	Strongly agree
1. The best way to acquire skills needed in construction industry by technical college students in electrical installation programme is through apprenticeship.	☐	☐	☐	☐	☐
2. The best way to acquire skills needed in construction industry by technical college students in electrical installation programme. is through formal form of learning	☐	☐	☐	☐	☐
3. The best way to acquire skills needed in construction industry by technical college students in electrical installation programme is through trial and error.	☐	☐	☐	☐	☐

4. The best way to acquire skills needed in construction industry by technical college students in electrical installation programme is through shadowing.	☐	☐	☐	☐	☐

4. Please indicate the extent to which you agree with the following statements regarding the skills of TVE college electrical installation graduates.

Statements	Strongly disagree	Disagree	Neither Agree or Disagree	Agree	Strongly agree
1. Overall, I am not satisfied with the performance of technical college graduates employed by my company.	☐	☐	☐	☐	☐
2. Overall, the technical college graduates employed by my company have skill deficiencies.	☐	☐	☐	☐	☐
3. Overall, technical college graduates in my company at the time of being employed were not suitable for the position.	☐	☐	☐	☐	☐

Section C:Measurement of Skills Gap

1. Below is a list of statements regarding the abilities of TVE college electrical installation graduates. Please indicate by ticking [✓] how much do you agree or disagree with these statements.

Statements	Strongly disagree	Disagree	Neither Agree or Disagree	Agree	Strongly agree
1. Graduates are able to represent written materials for various tasks.	☐	☐	☐	☐	☐
2. Graduates are able to understand how to solve technical problems.	☐	☐	☐	☐	☐
3. Graduates are able to listen and share ideas with other colleagues.	☐	☐	☐	☐	☐
4. Graduates are able to communicate verbally and in writing.	☐	☐	☐	☐	☐
5. Graduates are able to use Megger Multi metre for measuring current, voltage and resistance.	☐	☐	☐	☐	☐
6. Graduates are able to carry out electrical practical tasks individually at the site.	☐	☐	☐	☐	☐
7. Graduates are able to participate actively in workteam discussion.	☐	☐	☐	☐	☐
8. Graduates are able to test knowledge of mathematics into practice.	☐	☐	☐	☐	☐
9. Graduates are able to measure the luminous intensity of illumination.	☐	☐	☐	☐	☐
10. Graduates are able to apply related knowledge into practice.	☐	☐	☐	☐	☐
11. Graduates are able to measure voltage in an installation.	☐	☐	☐	☐	☐
12. Graduates are able to implement I.E.E Regulations safety standards.	☐	☐	☐	☐	☐
13. Graduates are able to operate machines during practical work on site.	☐	☐	☐	☐	☐
14. Graduates are able to integrate devices to achieve given practical tasks.	☐	☐	☐	☐	☐
15. Graduates are able to read and interpret various electrical installation drawings.	☐	☐	☐	☐	☐
16. Graduates are able to participate in motivating peers	☐	☐	☐	☐	☐
17. Graduates are able to exhibit self-confidence.	☐	☐	☐	☐	☐
18. Graduates are committed to continuous vocational improvement in electrical works.	☐	☐	☐	☐	☐

19. Graduates are able to communicate with people from other culture, religion and background.	☐	☐	☐	☐	☐
20. Graduates are able to understand others behaviour and attitudes.	☐	☐	☐	☐	☐
21. Graduates are able to react in a positive manner with other co-workers.	☐	☐	☐	☐	☐
22. Graduates are able to list practical terms and tasks in electrical works.	☐	☐	☐	☐	☐
23. Graduates are able to understand company organisational structure.	☐	☐	☐	☐	☐
24. Graduates are able to acknowledge communication channels.	☐	☐	☐	☐	☐
25. Graduates are able to observe issues such as interpersonal, personal and cultural aspects of co-workers.	☐	☐	☐	☐	☐
26. Graduates are able to organise and carry out conduit and surface wiring.	☐	☐	☐	☐	☐
27. Graduates are able to diagnose and rectify faults in an installation.	☐	☐	☐	☐	☐
28. Graduates are able to follow industry rules and regulations	☐	☐	☐	☐	☐
29. Graduates are able to settle work related conflicts.	☐	☐	☐	☐	☐
30. Graduates are able to perform well to solve problems related to electrical installation.	☐	☐	☐	☐	☐
31. Graduates are able to recognise effective decisions in certain tasks.	☐	☐	☐	☐	☐
32. Graduates are able to demonstrate a positive attitude to change.	☐	☐	☐	☐	☐
33. Graduates are able to generate new ideas during practical task on site.	☐	☐	☐	☐	☐
34. Graduates are able to use available and new technology in implementing practical tasks.	☐	☐	☐	☐	☐
35. Graduates are able to relate theoretical information to practical tasks.	☐	☐	☐	☐	☐
36. Graduates are able to propose innovative ideas for certain tasks.	☐	☐	☐	☐	☐
37. Graduates are able to manage practical tasks effectively.	☐	☐	☐	☐	☐
38. Graduates are able to perform well in working practically with others at workplace.	☐	☐	☐	☐	☐

39. Graduates are able to maintain good rapport with supervisors and peers.	☐	☐	☐	☐	☐
40. Graduates are able to participate as leaders in certain tasks.	☐	☐	☐	☐	☐
41. Graduates are able to justify and respect other people ideas, participations and opinions.	☐	☐	☐	☐	☐
42. Graduates are able to apply the acquired principles to technical issues at workplace.	☐	☐	☐	☐	☐

Section D: Improvement of TVE College Electrical Installation Programmes

1. Engaging with Educational Institutions

Regarding engaging with TVE colleges, please read the following statements and tick [✓] the appropriate box.

Statements	Strongly disagree	Disagree	Neither Agree or Disagree	Agree	Strongly agree
1. Electrical installation companies engaging with TVE colleges would ensure that the graduates match the labour market needs.	☐	☐	☐	☐	☐
2. My company communicates with TVE colleges.	☐	☐	☐	☐	☐
3. My company receives invitations for recruitment in technical colleges.	☐	☐	☐	☐	☐
4. My company receives invitations from TVE colleges to develop curricula.	☐	☐	☐	☐	☐
5. My company would like to engage more with TVE colleges in areas of placements, industrial attachments and internship.	☐	☐	☐	☐	☐

2. Suggestions for improving the quality of technical college graduates

Please rate the importance of the followings suggested ways to improve the quality of technical college graduates. Please tick [✓] the appropriate box.

Suggestion Solutions	Not important	Slightly important	Moderately important	Important	Very important
1. Curriculum review	☐	☐	☐	☐	☐
2. Refresher course for instructors.	☐	☐	☐	☐	☐
3. Provision of modern equipment and tools	☐	☐	☐	☐	☐
4. Collaboration with industry and companies	☐	☐	☐	☐	☐
5. Encouraging the students with loans and scholarship to learn	☐	☐	☐	☐	☐
6. To improve the standard of library/ ICT facilities	☐	☐	☐	☐	☐

3. Please add any suggestions that can be of help in improving TVE electrical installation programmes.

Provide your suggestions in the space below:

Thank you for taking time to fill in this questionnaire. Your assistance is greatly appreciated.

Appendix B-1: RESEARCH FEEDBACK FORM

Please provide comments on how valid the research findings are with regards to your experience. Kindly respond to the questions below by checking ticking one of the multiple-choice options and by providing your comment

Research Findings	Not important	Slightly important	Moderately important	Important	Very important
1. How important are the findings help in curriculum design of your programme of study?	☐	☐	☐	☐	☐
2. How important are the findings in diagnosing skills deficiency in programme curriculum?	☐	☐	☐	☐	☐
	Not Helpful	Slightly Helpful	Moderately Helpful	Helpful	Very Helpful
3. How helpful are the findings in including industry experts/professionals in curriculum design?	☐	☐	☐	☐	☐
4. How helpful are the findings in enabling educators/instructors prepare their graduates to meet employers/industry need?	☐	☐	☐	☐	☐
5. How helpful are the findings in tackling the deficiencies in high- and low-level skills?					
	Not useful	Slightly useful	Moderately useful	Useful	Very Useful
6. How useful are the findings in suggesting improvement of skills development?	☐	☐	☐	☐	☐
7. How useful are the findings in developing a framework for the measurement of skills gap?	☐	☐	☐	☐	☐

Appendix B-2: Summary of the Findings

Summary of the findings of the study on Skills gap Assessment to enhance the delivery of Technical and Vocational Education: A case study of Electrical Installation Graduates in Nigeria

Main findings of the study are discussed according to the research questions and objectives that the study was set out to achieve. The first research question is identifying desirable skills that are in demand by the industry, and methods adopted in measuring the skills gap. This goes along with objective two which is the development of a framework for the measurement of skills gap in construction industry.

The quantitative findings of this study suggested seven skills which were among the desirable skills that are in demand by the construction industry in the literature but in which the craft workers are found to be deficient to include thinking ability skill, reading skills, written communication skills, leadership skills, negotiation skills, time management skills and core skills for learning skills. In many respects employers were looking for hybrid skills that may be classified accordingly, a mix of generic skills; a mix of technical skills; and a mix of both generic and technical skills. It is apparent that, for most construction industries, skills gaps were multi-faceted depending on the area of which the case study was undertaking. In similar vein, the findings of this quantitative research is similar to that of Ndoye& Walther, (2012) which highlighted similar skills gap found in craft workers in Africa and which are needed, to be communication skills, literacy, numeracy and cognitive skills, similarly, the finding of this study is equally similar to a focus group interview conducted by the National University of Educational Planning and Administration (NUEPA) on curricula skills in South and South Asia on employers, the researchers focused mainly on four areas to include perception of skills, requirements of general skills, possibility of acquiring skills at school and sector-specific skill gaps. The key skill gaps identified are non-cognitive skills especially communication skill, leadership skill, honesty/ethics skills, teamwork, and flexibility skills and similarly the

findings of this study is equally similar to the skills identified by the construction industry to be of importance to include, academic or cognitive skills, generic skills, technical or vocational skills and work related attitudes or soft skills (Stasz, 2001).

The qualitative findings of this study, the focus group (FG) discussion, the participants did not argue whether a skill is desirable or not, this indicates that they there is no feedback to the instructors on the deficiency of their graduates in the skills mentioned, that are of importance to the industry which are the technical, communication, literacy, and problem solving skills, but the findings shows that these skills were not well taught and this could bring about the deficiencies, here are some of the complaints of the instructors.

''There are two major problems with the issue of teaching all the skills you mentioned, even the skills you did not mention. The major challenges are in the area of resource personnel and materials for teaching the skills. We do not have enough, adequate and qualified staff in area of electrical installation to teach the program, there are round pegs in a square hole and, the worst of it all is that materials and equipment's for teaching the skills are obsolete and in most cases not available.'' (FG Participant 1)

The statement from one of the instructors from one of the technical colleges indicates that some of the instructors are un-qualified and this shows that you cannot give what you don't have, all these contributes to the deficiencies in skills mentioned.

''Before a teacher can teach all the skills mentioned, he or she should have undergone training in education, some of us, instructors do not have a requisite qualification in education, to impact this skills becomes a problem because of lack of post graduate diploma in education, or at least a degree in education is necessary to make us qualify as a trained teacher. My advice is for the teachers to go for teachers training in education''

Research Question 2: The second research question investigates if the curriculum of vocational technical education in area of electrical installation satisfy the skills demand of the construction industry in terms of graduate students performing professional duties and responsibilities as needed? The quantitative analysis indicates that the overall, the majority which were (126; 48.3%) of the population agreed that the graduates were skill deficient, which means that the respondents from the industry were not satisfied. Out of the 42 skills listed for assessment of the electrical installation graduates, it was noticed that all the 42 skills listed have some measures of gap as none yielded a mean score of 5.00. Majorly 16 skills show deficiencies or skills gap up to 1.5 (-1.5) on the scale, this clearly shows that the curriculum the curriculum of vocational education in area of electrical installation does not satisfy the skills demand of the construction industry in terms of graduate students performing professional duties and responsibilities as needed.

Instructors in technical colleges in Nigeria believe that the issue of training the students both in theory and practice guiding their discipline is solely their responsibility but there are cases and issues that made them to be handicapped, like in area of providing materials needed for teaching and learning are not available, this gives room for skills gap to be prevalent. The federal government have not provided adequate funding to purchase equipment, tools and educational facilities necessary for teaching.

Objective three of this study is to design a framework to access the curriculum of TVE with a view to map the curriculum with the gap. The quantitative data revealed that the curriculum of vocational education in area of electrical installation did not satisfy the skills demand of the construction industry in terms of graduate students performing professional duties and responsibilities as needed.

Meanwhile, the study revealed thirteen top hierarchy electrical installation skills to learnt by the students to include, thinking ability skills, comprehension ability skills, reading skills, written communication skills, speaking and listening skills, leadership skills, negotiation skills, time

management skills, problem solving skills, interpersonal skills, core skills for learning, technical skills and job readiness skills. The students performed wonderfully well only in six out of the thirteen skills listed with rating as 'good' (mean approximately 4). The other seven skills they were rated as only being 'fair' (mean approximately 3) in seven skills to include leadership skills, negotiation skills, written communication skills, reading skills, time management skills, core skills for learning and thinking skills (means range from 2.97-3.49). This clearly shows that the performance of these students on the listed set of skills are just fair on the Likert scale drawn, the students shows evidence of deficiency in those skills which is contrary to research question 2.

7.3 Understanding the theoretical underpinning and state-of-the-art practice in identification of skills gap in skills

Objective one of this research was to understand the theoretical and state-of-art practice in identification of skills gap in academic, generic, technical, practical and employability skills required for employment in construction industry. The literature on skills gap in relation to electrical installation in industries was critically reviewed in other to see what the construction industry need in in terms of the skill required for employment. In the study the top thirteen electrical skills required for employment was revealed. Forty two electrical installation skills emanated from the thirteen top hierarchy revealed for assessing the skills gap. In depth study of the curriculum guiding electrical installation was carried out during the curriculum mapping, and it contained all the contents of electrical installation skills needed by the construction industry. Though the literature identified skills gap in academic, generic, technical, practical and employability (Stasz, 2001). During the focus group interview the majority of the instructors agreed that he curriculum is satisfying the skills demand of the industry to some ''extent'' the hindrances which debar them from not satisfying the skills demand are due to some of the challenges they faced during teaching for example an instructor said that ''there are two major problems with the issue of teaching all the skills you

mentioned, even the ones you did not mention. The major challenges are in area of resource personnel and materials for teaching the skills. We do not have enough, adequate and qualified staff in area of electrical installation to teach the program, there are round pegs in a square hole and, the worst of it all is that materials and equipment's for teaching the skills are obsolete and in most cases not available'' this implies that the education system is not delivering the much needed employment skills and the overall outcomes of learning are very poor.

During the focus group interview the instructors suggested and argued that the industry and the subject specialist should be invited during the curriculum development so that they can be involved, to make sure that they bridge the skills gap that is prevalent, failure to invite the specialist in the area of electrical installation constitute a problem of skills gap, because curriculum set by the Professors are not relevant to what the industry need.

7.4 Curriculum

All the instructors that gathered during the focus group interview have the understanding of the word curriculum and, they defined the term curriculum as expected of them. An instructor defined curriculum as: ''*t*he term *curriculum* refers to the lessons and academic content taught in a school or in a specific course or program for a period of time. In the school system *curriculum* is often defined as the courses offered by a school, but it is rarely used in such a general sense in schools'', which means that the term is well known to most of them, because they are specialist on the field.

The instructors pointed out the components of curriculum to include scheme of work, syllabus, module and note of lesson. Majority of them discussed the purpose of the curriculum that, it serves as a guide in knowing what to teach at a particular point in time.

Respondents at the interview suggested the modification of the electrical installation curriculum. They recommended evaluation and periodical

review of the curriculum, collaboration and provision of adequate facilities for training.

7.4.1 Evaluation of teaching staff

During the focus group interview, discussion on how to teach some skills emerged, the findings show that, some teachers do not possess teaching certificate as the bases for teaching, this could contribute to issue of skills gap when the teacher cannot explain the topic at hand as expected.

7.4.2 Entry requirements

The respondents suggested changes in the entry requirements of the students admitted as, majority of the students' admitted were unable to cope and comprehend in their major disciplines with Junior secondary certificate ,which is the minimum admission requirement, though the standard of education has fallen drastically in Nigeria.

7.5 Ratings of importance of generic skills needed by electrical installation craft men

Technical institutions all over, have been recognised for imparting the necessary skills required needed for employment, knowing fully, that skills acquisition is through both formal and informal settings. It was noted that craft workers lack the required skill to work in industries (Ofori, 2000). The issue of skills gap stemmed from the fact that the craft workers are lacking from the skills required for work. Technical Vocational Education and Training (TVET) have been identified as a tool that can help improve the technical knowhow in industries, they are in charge of training, which signify that, all the skills needed in industry are expected to have been imparted in there graduates, the TVET is in position to equip the craft workers with the key skills needed for work (Jayaram &Engmann, 2017), contrary to this the quantitative analysis result shows that all the thirteen skills identified in the literature review which were thinking ability, comprehension ability, reading skills, written communication skills, speaking and listening skills, leadership skills, negotiation skills, time management skills, problem solving ability,

interpersonal skills, core skills for learning, technical skills and job readiness skills are all important to the employers. The result revealed that the respondents rated of the skills as '5-Very Important. These are: 1. Problem-solving ability (mean=4.79; SD=.92) 2. Job readiness (mean=4.58; SD=.71) and 3. Technical Skills All other skills were rated with 4 'Important' and they include reading ability (mean=4.45; SD=.56) time management skills (mean=4.36; SD=.92), thinking skills (mean=4.31; SD=.53) and interpersonal skills (mean=4.14; SD=.59). The remaining skills rated as 'important' (mean approximately 4) by the respondents are: written communication skills, core skills for learning, negotiation skills, comprehension ability, leadership skills as well as speaking and listening skills (mean averages between 3.69 and 3.97). By these results, all the skills were rated as important by the respondents. However job specific skills were rated more highly than cognitive skills and management skills

7.6 Ratings of graduate demonstration of electrical installation skills

The review of the literature identified the major thirteen skills that are found necessary for the craft men in the 21st century, to include thinking ability skills, comprehension ability skills, reading skills, written communication skills, speaking and listening skills, leadership skills, negotiation skills, time management skills, problem solving ability, interpersonal skills, core skill for learning, technical skills and job readiness skills.

The findings of the quantitative analysis here shows that out of the thirteen top skills identified to be of importance, graduates were rated as 'good' (mean approximately 4) six out of the thirteen skills listed. These are job readiness (mean=3.89; SD=49), technical skills (mean=3.89; SD=.90), comprehension ability (mean=3.61; SD=.60), problem solving skills (mean=3.59; SD=.79), speaking and listening skills (mean=3.57; SD=.63) and interpersonal skills (mean=3.56; SD=.64). On the other hand, the respondents rated graduates' performance as only been 'fair' with (mean score approximately 3) in seven skills listed: leadership skills, negotiation

skills, written communication skills, reading skills, time management skills, core skills for learning and thinking skills (means range from 2.97-3.49). This clearly shows that the performance of these students on the listed set of skills are just fair, showing deficiencies in seven skills out of thirteen skills listed.

7.7 Methods of skills acquisition for TVE college electrical installation graduates

The questionnaire for this study suggested four methods of skill acquisition for TVE College electrical installation graduates to be apprenticeship, formal learning, trial and error, and shadowing. Out of the four methods suggested, the findings show that the respondents agreed that apprenticeship is the best method with 96.9% which has the greatest respondents, followed by formal learning as the second best method of skill acquisition with 64% respondents, they however disagreed with the possibility of trial and error or shadowing being the best ways.

7.8 Respondents' perception of skills of TVE college electrical installation graduates

In getting the overall perception of adequacy of skills of technical college graduates, the questionnaire survey posed three major statements, the first is about employers whether they are satisfied with the overall performance of the technical college graduates, and the quantitative analysis shows that (121; 46.4%) shows sign of dis-agreement in their option, this means they were satisfied.

The second question is about skill deficiencies, the overall respondents from the quantitative analysis shows that (126; 48.3%) agreed that the graduates of technical college were skill deficient, which means that the respondents were not satisfied.

The third question is about whether the graduates of technical college employed suitable for the position applied for, the quantitative analysis of

the questionnaire shows that the overall response was (193, 73.9%) disagreed in their option, which means that they were satisfied.

The major area of concern is the one that is related to skill deficiencies, which is number two, the analysis shows that the respondents agreed that the students of the technical college are skill deficient.

In the same vein, during the focus group discussion a question was raised to discuss ''How well does the current curriculum guiding electrical installation program satisfy the skills demand by construction companies''? The qualitative analysis shows that the curriculum guiding the programme is not satisfying the skills demand of the industry. The analysis shows that the curriculum is out of date and is not in conformity with the requirements of the industry and moreover, there are no equipment's and tools to teach the students the required skills meant for employment.

These are the responses from different electrical installation instructors, this stands as an evidence that the skilled acquired by these set of graduates truly, are not sufficient and enough for gaining employment into the industry.

7.9 Measurement of skills gap in the quality of TVE college electrical installation graduates

Forty two skills have been identified for college electrical installation graduates, for measuring where skills gap exist. In carrying out the skills gap analysis for the 42 skills, each skill is attached to the identified thirteen higher level skill. The findings from the study shows that the 42 skills listed for measurement have some measures of gap as none yielded a mean score of 5.00.

The findings shows 16 skills with deficiencies or skills gap up to 1.5 (-1.5) on the Likert scale used.

The specific skills showing deficiencies are item 1: ability to represent written materials for various tasks; item 3: Listening and sharing ideas with

other colleagues; item 4: Communicating verbally and in writing; item 8: Putting knowledge of mathematics into practice; item 9: Measuring the luminous intensity of illumination; item 16: participate in motivating peers; item 19: Communicating with people from other culture, religion and background; item 20: Understand others behaviour and attitudes; item 27: Diagnosing and rectifying faults in an installation; item 29: Settling work related conflicts; item 30: Performing well to solve problems related to electrical installation; item 31: Recognising effective decisions in certain tasks; item 33: Generating new ideas during practical task on site; item 34: Using available and new technology in implementing practical tasks; item 36: Proposing innovative ideas for certain tasks; and item 37: Managing practical tasks effectively. The 16 afore mentioned skills show some perceived shortfall but not a very large gap.

The table further shows that the remaining 26 areas yielded mean scores around 4.00 out of the maximum obtainable mean score of 5.00 indicating moderate skills gap of minus 1(-1) on the scale. These are on items 2, 5, 6, 7, 10, 11, 12, 13, 14, 15, 17, 18, 21, 22, 23, 24, 25, 26, 28, 32, 35, 38, 39, 40, 41 and 42. Above all, the weighted average of 3.66 out of 5.00 highest score possible, indicates an overall skills gap of -1.34. This shows that there is a deficiency of up to 26.8% in the skills measured.

These findings shows sixteen skills in which these set of graduates were deficient.

7.10 Respondent's disposition towards engagement with educational institutions

It is clearly evident that gaps exist between the requirements of industry and the skill levels of technical college graduates in some skills in which the graduates shows deficiencies, this calls for improvement, in the questionnaire survey five options were given to the respondents to react to, in the quantitative analysis it is evident that all the five options yielded mean

scores of 3.79 and 3.80, this is an indication that the respondents tends towards agree which signify that partnership and having collaboration between the technical institutions and electrical installation companies would ensure technical college graduates match industry needs as well as help in internship and industrial attachments.

The quantitative analysis show that there was communication gap between the industry and the TVE colleges because the mean score is 2.73 which is below 3.50, this shows that the colleges are not communicating with the electrical companies. It equally shows from the analysis that the industry does not receive invitation from the college during curriculum development, and invariably in the area of employment it is shown that the industry receives invitation for recruitment of the college graduates.

The implications of the finding is that where the mean score is more than3.50 is that the partnership will help institutions know what is required of them to satisfy the industry in terms of skills required and the institution will be of benefit as their students are been employed. The implication of where the mean score falls below 3.50 is that the institution will not be able to meet with the requirements of the industry.

7.11 Suggestions for improving quality of technical college graduates

The questionnaire survey suggested six ways to improve the quality of technical college graduates to include, review of the entire curriculum guiding their study, providing the modern equipment and tools in the workshop, having collaboration with industry and companies in drawing curriculum, to encourage the students with loans and scholarship to learn and to improve the standard of library and ICT facilities. All these suggestions proffer solution for improving the quality of vocational technical education

The quantitative analysis revealed that the weighted average for the suggested improvement to be 4.62, which signify that the suggestions for improvement were very important to the programme of study.

This means that the curriculum must be reviewed periodically such that the instructors will be able to teach skills that are relevant and current to the need of the industry.

This mean that the curriculum is not adequate in content and adequate in quality. Curriculum review is necessary so as to go with the trend of work in industry as the old ones are so obsolete and not current for the immediate use.

In general, the qualitative and quantitative findings indicated that, in improving the status of the technical college graduates, the curriculum must be reviewed, the issue of collaboration of experts in the field and provision of adequate facilities will help improve the quality of technical college graduates produced.

7.12 Conclusion

This study has explored the issue of skills gap among the graduates of electrical installation in technical colleges in Nigeria and the stakeholders, the construction industry, and found that a number of factors have contributed to the challenges. Nevertheless, the literature suggests that graduates of technical colleges in area of electrical installation have not been able to satisfy the labour market needs and requirements. One of the main factors that has contributed to this problem, as identified through the literature is the in ability of the education sector to provide basic knowledge, skills and prepare the graduates for labour market requirements. Moreover, they even indicated that the technical education in Nigeria even based more of theory than practice. This contribute to technical college electrical installation graduates in Nigeria not ready for the labour market. The major concern of the instructors is that the government have not provided materials, equipment's and even resource persons to teach these set of

electrical installation graduates. The critical factors that negatively hindered the electrical installations skills improvement were non availability of resources, materials and equipment's. The electrical installation instructors can overcome these factors and improve the students' electrical installation skills once the curriculum is reviewed to satisfy the requirements of the stakeholders. The pedagogy is improved, and facilities are made available.

The respondents suggested ways and measures to improve the students' electrical installation skills to include collaboration with industries and companies, inviting the stakeholders to participate in curriculum development, refresher course for instructors, provision of modern equipment and tools. Having all these in place will eventually bring a great achievement and surely improve electrical installation graduate's skill and make them more relevant and be ready for the labour market. Therefore, the next chapter presents recommendations to overcome and improve the electrical installation skills situation at the technical colleges in Nigeria. It will also provide a conclusion for the research, identifies limitations, and make suggestions for future research.

Appendix C-1: Template for Coding the Qualitative Data

Themes	Categories	Examples of Codes
Definitions of Curriculum	Educational Management, Programmes, Courses	Module, Scheme of work, Syllabus, Note of Lesson
Teaching of skills in Electrical Installation Programme	Vocational Education, Courses, Programmes	Workshop, Lack of tools and equipment's, Resource Personnel
Curriculum Design	Educational Management	NBTE, WAEC, Industry
Suitability of electrical installation programme curriculum in satisfying skills demand of the industry	Educational Management, Courses, Programmes	Instructors, Equipment's and tools
Teaching the content of the curriculum guiding Electrical Installation Programme	Educational Management, Courses, Programmes	Syllabus, Modules,
Improving the curriculum guiding the Programme	Educational Management, Courses, Programmes	Curriculum Reviewers, collaboration with industry and Society

Appendix C-2 Transcription Report FGD 1

Now to the research assistant.

Interviewer- Without wasting much time, let's go to the question we have. It is a discussion group, focus group discussion, there are no wrong or right answers, just give me your views concerning what you know about the questions.

The first one is for us to discuss what you understand by the term curriculum and you should please explain the purpose of curriculum in the program of study

Interviewee 1- curriculum is the planned school system so curriculum must be implemented in the school plan system. It contains the syllabus the scheme of work, the lesson note, it must not the outside the school and it must be well planned and well organized and we'll inevitable in the school system. The syllabus contain what should be taught in a year while the scheme of work is what will be taught during the term, and the lesson note is the work to be done during the weeks and it must be well planned and organised and we'll delivered to the student.

Question: What is the purpose of curriculum in a program of study?

Interviewee-The purpose of curriculum in the program of study is just an acknowledged, it is the curriculum that organise the day to day activities of study for a term, in a year and duration of the course probably a three years program course, the curriculum will be drawn to cover the whole three years and breakdown into either modules or terms so that each steps of a term will be accessed for the curriculum, so that the whole program of a study is embedded in a such a curriculum. And it's from this curriculum that the text items will be taken from graded students andaccess student occurs.

Interviewer - Thank you

Interviewee - The purpose again is for the teachers or for those that implement the curriculum not to go beyond what is planned for the student,

because if there's curriculum and it is well planned and being followed, the teachers will not go beyond or above of what is supposed to be taught.

In addition, a curriculum is just to checkmate teaching and learning process so that the teaching and process will not be weak or abstract. So that is another aspect of curriculum in a learning and teaching process.

Interviewer: Thank you very much sir.

Interviewee: Let me also add something to the purpose of curriculum, the purpose is just to develop a knowledge, skill, attitude and value that will enable the learners to become eligible for entry level. Employment in the electrical field

Interviewer: Any other person

Interviewee: Yes, I think the totality of Education in general is to cause a change in attitude, value and behaviour of the supposed learner, and at the same time, the essence of Education is to also effect national development to create a change in positive way and value. So, the entire essence of curriculum is to tailor the teacher or the tutor towards achieving a particular national goal. If for instance, as a developing county, if it is the decision of the educational committee of that country of that nation to tailor their educational system or curricular system toward scientifically development. The curriculum is always there to guide you so that at the end, the goal set will be achieved.

Interviewer: Thank you very sir.

Question 2: Please let us discuss how technical, communication, literacy and problem-solving skills. How they are taught electrical installation program in technical colleges. We have some skills like communication skills literacy and problem-solving skills, technical skills, how are they taught in electrical installation program in technical colleges.

Interviewee: I think I didn't hear the question very well, can you come again?

Interviewer: We have some skills which the instructors are teaching the students like the communication skill. Under communication skill we have English and the rest. Another problem-solving skill are Mathematics and soon. Technicalskills which is majorly practical, how are these skills taught in electrical installation program.

Interviewee: This either problem solving communication skills, the way they are being embedded in the electrical installation program is that, you know we have electrical installation study. The way they are being embedded in the electrical installation study is that you know we have a time table and these time table will have periods in which there is time for English, mathematics and then the time for the skill which is in terms of the practical of that very department, all these now they go in hand, like the communication skill which is under the language you which is the medium of expression now they will start from the simplest to the complex. When you are explaining to a student there must be certain medium of expression in which you cannot use your local language to express because you need to use an international you know that the lingua Franca we have in Nigeria you know Nigeria is a English speaking country then the only medium that we need to communicate with students we use under communication skill is English, you know under the problem solving skills, in electrical installation you know that there is some plus or minus is that is I. The terms of calculation you know you need to quantify this and that and then you need to do some measurements. If there's no basic arithmetic knowledge there is no way in which they learner will understand. For example, let me just digress a little bit, you know in our local traditional something, you know they do say that the more quantity of drugs you take, then the quicker the ailment will go. But you know without any measurement, but now electrical installation and tools, everything you know is under measurement, that is under check and balance. So both skill communication that is the mathematical aspect of it and the skill the or go and hand in hand.

Interviewer: Thank you very much

Interviewee: Just in addition to what he has said, the curriculum for technical education has been designed in such a way that before you can be said to be qualified as a graduate of technical college, you must have gone through general studies and your trade specialisation, so under general studies, here have communication skill, English , the problem solving skills is mathematics , the civic education plus other necessary general subject as you see it fit to your relevant trade specialisation and so from electrical installation student is compulsory for them to take this general subject as a perquisite for them to graduate as a technician in that field. It is not a matter of you coming to electrical installation you have to pass mathematics, if you are in catering you have to pass biology, you have to pass physics, I think that is the best I can say now.

Interviewer: Contribution?

Interviewee: Excuse me, this electrical installation we have a master plan towards the timetable that is being used by the student. This timetable this master plan is divided into three. We have general education subject which the studentsmust go through before they are successful in electrical installation like they were into English, mathematics, physics, chemistry, economics, entrepreneurship, ICT and economics. So, all this subjectis fixed in a week, they must have at least two periods each. Then again, we have the related subject, the mechanical engineer course which could be known as technical drawing and the necessity were being taught.

This also maybe they have four periods in a week then their own trade subject we have almost four subjects which they have as their own basic subject that is the subject they were supposed to be taught. They have domestic installation, industrial installation rounding of electronic motors, the trade subject am talking about maybe we normally in that masterplan almost two days that is 16 hours we are given to these subject because that is the major subject they came for that is what is known as electrical

installation study so all these courses were embedded into the masterplan Monday to Friday they will now go to classes I think only on Friday they will be in the workshop for practical aspect so that's how this electrical something were taught in technical colleges.

Interviewer: Thank you sir, thank you very much.

Question 3: please describe how you will design the curriculum guiding the electrical installation program. How will you design the curriculum guiding your trade?

Interviewee: Thank you sir you know that technology is not static but it is dynamic in designing a curriculum for electrical installation we all need to study the environment needs you know in those days what electrical installation in those days were is quite different from electrical installation of today because everyday technology advances therefore when one to design a curriculum for an electrical installation we need to take Industry into consideration because now what are the needs in the industry, what are the needs in the society so that in designing the curriculum it must move with societal wants.

Interviewer: Thank you very much any other contribution.

Interviewee: let me add something to it in designing a curriculum for electrical installation once we said that is a setup of what they must know in that particular department so it must come the simple one to the complex one so that whatever that is going to be taught them start from maybe is it the domestic installation are they going to know it must be effected in design curriculum maybe it is wiring everything must be into the curriculum so they will not be able to go extra mile. That's all I know.

Interviewee: in addition to that I just want to add one or two things, you know the curriculum designing guide three set of people.

1. It must be able to guide the learner.
2. It must be able to guide the teacher.

3. Then it must be able to guide the evaluator.

Those three people, now in designing those curriculum must consider those three aspects the learner, what do we want them to achieve at the end of that particular subject, what are the things or goals that we want this student to achieve we must include it in that curriculum then in case of teacher the area we want the teacher to cover must be considered in designing the curriculum for that electrical, then when we want to evaluate, when the evaluator want to teach or want to test the learner he or she must consider all the aspects of those curriculum in order to bring the question or evaluate the students, so therefore the environment as they as said has more influence in whatever we want to give to the students we cannot say what we have been teaching our students in maybe ten twenty years ago we still want to include it in this era so it will be it will not be useful so we should look at what is going on before we are doing something like this surface is more common there is something we call conduit so by the time we want to design the curriculum we must consider all those new things that is around.

Interviewer: Thank you.

Interviewee: then in addition I just want to add, what actually happened is that we should also consider the industry specification and also put them into consideration when designing the curriculum because what is entailed in the company nowadays is like is the modernized one because in the olden days you see at times as if assuming like electrical they want to operate or move one object from one place to the other it will be done by human effort but mostly nowadays in the companies you see them using robots, pressing button that oya they just press one button and robot will carry it from one place to the other with operation of buttons and motherboard but today you will see that most of the learners they don't even understand all that because they have been taught what it entails in the curriculum is outdated plan but I believe if we can meet with the industry specification, then we

will be able to incorporate what is modernised technology to the current curriculum.

Interviewer: Thank you very much.

Interviewee: I want to say something too in designing you need to look at the prospect of our student when leaving school cause that is the main objective of them coming down to technical schools if by the end of our program you have not been able to start consider that you want to be a set of freeman on your own self-reliance, you are now going to any government to ask for whatever that you want to establish yourself at the end of this program whatever you are being taught in school you should be able to practice it outside confidently not half way, so when designing we design in such a way that when our students leaves they can do what is expected of them outside that is the basic thing of it.

Interviewer: Thank you very much sir.

Interviewee: I believe the body language of electrical and the advancement in technology as it progresses In day to day is to be considered in designing the curriculum in a situation whereby the English they are been taught is not reflecting what an electrical man would be able to look to in his course of study if that one is missing you will just that there will be separation between the study of English, mathematics or whatever as to be in line with electrical language so that it will not be the English of somebody who is studying medicine. If an electrical man is teaching they are not given technical English that will suite, that will be able to apply when is out then that design is not okay, so we rather design every body language of electrical that you have to affect their mathematics, calculations where it will be applied and they will be able to get it. It is not just ordinary mathematics.it is not ordinary English but how it relates to the course of study so that the student will be able to know that when say iron you will know the type of iron they are talking about, when they are talking of hammer you will be able to relate it to its own course, that all I have to say.

Interviewee: has he has already said you know that there are some technical terms each trade has his own terms when we are talking about in electrical now, when are talking about electromagnetism then you get to another phase you will not even understand what it means you now and then in terms of calculations you have series of formulas we normally use in electrical installation which is not applicable in other series, you know we are talking about communication and then literacy problems and under this literacy problems and under this illiteracy problem, I think we're still on illiteracy problem? . Or we are still online.

In technical section we have what is known as technical jargons. Its jargons but it's meaningful to grammarian it's jargons but to technicians it is something that is meaningful. So, when planning curriculum, we must put our own technical jargons that the technician will understand, thank you very much.

Question 4: How does the current curriculum guiding electrical installation program satisfy the skills demand by construction companies?

Interviewee: critically if we examine the present curriculum in present situation when we are talking of the present technology because the present curriculum is partly hydrated. There are so many designs and so many technologies the extent that in electronic solution now they're not using microchip board no big panels you just see some. But today we just have a very small board even fully electronics. So, the present days curriculum is not work while the present society.

Interviewer: More contributions.

Interviewee: Can I please have the question again sir.

How does the current curriculum guiding electrical installation that is current curriculum of electrical installation program how does satisfy the skills demand by construction companies?

Interviewee: Going by the question, I believe the curriculum the present curriculum is based on theory. There are no practical's inclined, 90% of the curriculum that was drawn, is based on theory. But we believe that electrical installation has majorly to deal with practical aspect but in the case where students will be taught based on theory without seeing what they are being taught, I believe electrical installation is not an abstract subject, is not an abstract trade. On like mathematics, students need to see what is been taught, the curriculum is drawn to the theoretical aspect more than the practical aspect in which the student can visibly see what has been taught. That's my submission.

Interviewee: In addition to it, the government has made it such a way that, at least a ten periods for the student to have access, that is where they can now observe and see for real what have been taught in the school. Like now we have the year one on attachment that is another part of curriculum that is just designed from the government. Every year students should go on attachment their will not be much talk, but they want them to have the feeling of what it looks like. We are told this is a white bulb you can see what a white bulb is. The year two students their third term is meant for attachment, they have been taught at least more than the year one, we expect more from them like some of our students go to electrical companies for their attachment, some to the big industries even up to Lagos Ibadan thereby. They can have more access to the real practical. You have been taught if you merge take white and black it gives you green or you want to put normal wiring 13 hand socket, we have the yellow, the black, the brown, where and where are this on going. Where you are on attachment then you can have access to it that okay, this is what my teachers taught me, this is the way I should fix this wires, I believe with that the government is still trying but they still need to improve on what is in the curriculum.

Interviewee: I disagree a bit with what my colleague have said, I think theory and practical's having to go paripassu you don't have to tell them to go outside and to go and learn what they have taught them. Why you are

teaching the students they ought to have seen what you are telling them. You are explaining maybe you want to teach them about panel then let them see it. You don't have to wait to when they are going to industrial training no, shouldn't be industrial training should have to stand that what to compliment what you have taught them never seen it, they don't need to go out and start asking ok, what is this. The panel they have taught them I have not seen this one before no, it shouldn't be!

Researcher: what could have been the problem for not providing …

Interviewee: The major problem comes from the government , they were no provisions, the government expected the teacher to go and look for what to use to teach the children, improvisation may be if the come but the students need to work on their own, after they I might have been taught those things, seeing them , they need to go and study on their own.

But the non-availability of the practical materials in which they lack is from the government.

Interviewee: To buttress what he has said, you know the government needs to assist in the area of in-service training for the instructors. Let's look at it in this direction, even the modern boards, some instructors have not seen it, they don't know the operation. Most of the companies, in the companies a lots of equipment they are using there, many instructors, we cannot operate it, because we don't have the knowledge of it except if we have in-service training that will assist us maybe to go to company, to see what is going on there, so that we will be able to come back, then download the whole something to this learners so that they will be able to come up with the new ideas but in-service training is not there.

Interviewee: The curriculum is outdated, it's not worthwhile.

Interviewer: So, you don't do curriculum review.

Interviewee: We do curriculum review

Interviewer: How many years?

Interviewee: The one we did last, was 2011 or so, but it's supposed to be 5 years review

Interviewer: Thank you very much.

Interviewer: Would you explain how the whole curriculum guiding your program, how do you teach it?

Interviewee: By breaking them into schemes we break them down so, which was the first one maybe in domestic installation, the topics are supposed to take on the domestic relisted it, choose it one by one. So, if another one comes under it again, we treat it and deliver it to the students.

Interviewee: In addition, we break it into schemes as rightly said but it will be from simple to complex, after breaking it according to the level of the learners we break it from simple to complex

Interviewee: In electrical, we have domestic installation and we have industrial installation, we have rewinding of electrical machine, we have battery charging and all these, they are in modules. Like for those who wants to attempt modular exam, so some will have to examine domestic installation which is the first module.

Then the second module which is industrial installation and the third module is rewinding of electrical machines.

Interviewee: To buttress they have said so far, every curriculum is being broken down from what we call syllabus or modules we break them down, we pick them to suit each level of education of the student like those that would be in year one, 100 level, 200 level, then 300, to repeat the one that will suit them from the simple to the complex so that they will be taught in accordance with the curriculum so they break them down to syllabus and modules

Interviewee: It's like when you are coming in, you need to introduce somebody that is new into a system so the first aspect of it is the introductory aspect, there are some minor steps that the students have to

be familiar with first before you now graduate to the complex one, to the problem solving and troubleshooting because we cannot just pick without Introducing somebody that is coming in new. By the time you bring the introductory aspect of it and depends on how you bring them in such a way that they will have interest in it. You relate it with what they can see within the environment, what they make use of on daily basis, from there you now take them to the higher level.

Interviewer: Thank you very much

Interviewee: In breaking down the curriculum, we break it down tongue scheme, then from the scheme down to the lesson plan. It's the curriculum now you draw your scheme, that scheme now is based on termly. In a term we have about 12 or 13 weeks now

Interviewer: Is it term you use or semester

Interviewee: We are using term, maybe we have 13 weeks or 14 weeks though that now will be now in the scheme.

After that now then, we come to the plan that now be on weekly basis okay per week. How many hours do I have per week, maybe I have two hours, or two periods, maybe for the first period okay I have this topic, now that can become under the lesson note, the lesson note now is the one that will guide you on your daily activities to graduate from the curriculum to the scheme then from there to lesson plan, from lesson plan now to be lesson note while be a guideline between the teacher and the learner.

Interviewer: The last question, says discuss way of discussing the curriculum guiding your program which is electrical installation in areas of technical communication literacy problems solving skills, how do you improve the curriculum guiding your program. Ways of improving the curriculum guiding your trade in those areas identified.

Interviewee: There should be constant review of the curriculum and I think the people on ground those that were in that field should be invited not that

somebody will just go, draw the curriculum, they should invite those that are in electrical, there are stake holders there, let them invite them, let them chip in their own ideas and there should be constant review.

More so, there should be proper in-service training for all those in the field not that the money will be coming and some people will be syphoning it that , let this service training do as to upgrade the instructors and just go and be doing the service on their own, let the government assist them. Another point is that there should be provisions for practical and this should also be inculcated into the curriculum. Maybe they would spend some time having practical's that maybe okay or this special term is based on practical alone so that we can change the orientation of the instructors likewise the students.

Another thing is that there should be proper funding of technical colleges, University of technologies, polytechnics that has to do with electrical installations so that we can have properly made graduates.

Interviewee: to support what he said the curriculum should be reviewed and the expertise should be called to review it not that somebody will just sit down and just do the review, let me use a department as an example, painting department we have intermediate, we have advance, that advance the curriculum from beginning to the end is screen printing nothing of painting in the curriculum so the government should make effort to do the revision to review the curriculum through the expert not just anybody.

Interviewee: the practical it is possible for the government to have models if we cannot go into real materials at least when teaching the students we have the models we can bring in like wiring of a thing I will have a model of small units I can demonstrate with that model how to wire a room from there the students can have that knowledge that okay this is the way to put in plus and minus

Cause I cannot carry a whole building and say everybody come in but the model I can show them how to wire a domestic installation.

Interviewer: Thank you very much.

Interviewee: in addition to improve the curriculum I could be correct in those days you know when an electrical industry in Nigeria bring some junks down to the colleges will use it to take the students. Now if the government can try as much as possible to liaise each college with each company or first of all go there an stand as an intermediary between the company and then the school and tell them we need their assistance in so area , so that may be once in a while as if maybe in terms of they are going for excursion, you know students believe in what they use their hands to mould ,what they use their eyes to see with the things in their neighbourhood so, if the practical aspect is even more than theory curriculum during the review that will tend to improve during the review during the review will improve our technology because all these were difficult. Countries that we are looking as being advanced, all of them that they just brought them here to Nigeria here that we call them engineers, they are all technicians. Some of them may even pass technical colleges like this but they plan their curriculum the way they review it brings advancement into their country so if we try to review our curriculum constantly and to meet the immediate need or the the immediate technology level then, I think that one will be better not that to put a ran den in a square roll.

Interviewer: Thank you very much

Interviewee: In addition, Sir, my colleagues have been talking on curriculum review it has to be done and the experts there, they must know what they are doing. It's not that any individual that is not qualified will be recommending or structuring curriculum for students. According to the National bodies' questions, these set of practical questions is being set by non qualified personnels. There are no more experts in setting questions, the questions were obsolete. This time around this curriculum must be reviewed time to time, then the entry qualification of the students into technical colleges is nothing to write room about, I can call it primary three. Primary six students entering into technical colleges. I think they are facing

most of the subject they are running from in the secondary school, they are facing physics, chemistry and many other things. So, what can a primary six student do with physics and chemistry so the entry qualification must be reviewed this time around? Because I don't know the difference between JSS3 and Primary three, it's still the same thing so the entry qualification must be changed and the School cert failed that is the G4, they call themselves G4. They can still perform, in the present technical education system, if you look at the two grades now, the JSS3 and the School cert failed you will see the difference because the secondary school students who failed that came here came into technical colleges perform better than the JSS 3 students, the entry qualification must be changed then the funding government has forgotten technical education for the last thirty years , I will put it that way, obsolete tools in each workshop, so they must fund technical education if they want to do it . Give us modern tools this students will know exactly like two three years ago they came with a wire, they enter the school , giving us three phase wire ,if you see the meter they brought I think even I cannot use it in my house, and they said they have done something in technical colleges. It was refunded then the in-service training to the teachers for the past twenty five years either any teacher go for service training then again the attachment the system of attachment of students into this companies maybe the government should assist the school were the people attaching this students, I don't see any changes in the student in the 2nd year going to 3rd year they were deteriorating what have seen has the vice principal what have seen when they came back, nothing is as if they are going to start from the first year so, if the government can aid this attachment it's going to be meaningful like a recognised wire and cable industry available. If the government can help the students will go, there.

While I was in University, I had the opportunity to go to a recognised cable and wire industry and I saw how wire has been processed, I don't know wire do pass through water to check if that wire has fault. So, you will be able to see either that wire is a continuous one or it has break. So, if the government

could be able to find this attachment it will be better than the school funding this attachment.

Then finally, the curriculum must be designed in a simple something, if you look at the curriculum this people were designing is like if it's University syllabus. We went to a technical institution in Nigeria two three years ago to take the things down to the level of the students. So, the experts in the field are there while the professors are reviewing this curriculum, they don't know what they do at times so it must be reviewed by the instructors that are qualified.

Interviewer: Thank you very much, I appreciate you all. Any other comments

Interviewee: I think technical as a whole need to be revived from dying when you look at technical system of operations in schools is different from industry. In a situation whereby your mate who pass out the same time you already born the same day qualify the same hour is giving fat in the industry and Somebodyin school is living, if you friend say you better come over the foundation of technical education is dying because nobody will see something fat and wait at where it is being mean so the government should be able to save technical education from total collapse. Thank you

Interviewer: Thank you very much, I want to sincerely thank everybody here present for your participation, your contribution will make a valuable contribution to this research I appreciate you all.

Sincerely,

The researcher

You are all welcome

Clap session...

FGD 2 TRANSCRIPTION

Good morning all, you are all welcome to our session. Now to the research assistant.

Interviewer- Without wasting much time, let's go to the question we have. It is a discussion group, focus group discussion, there are no wrong or right answers, just give me your views concerning what you know about the questions.

The first one is for us to discuss what you understand by the term curriculum and you should please explain the purpose of curriculum in the program of study

Please i will like you to introduce yourself.

Interviewees: I am one of the participants

Interviewer: You are welcome

I'm one of the participants

Interviewer: You are welcome

I'm one of the participants.

Interviewer: You are welcome

I am one of the participants

Interviewer: You are welcome

Interviewer: Straight to the questions without much delay.

The first question is could you please describe what you understand by the term curriculum? And you should please explain the curriculum in the program of study.

Interviewee: Curriculum in my own understanding are the list of the topics per subject which a student must know or must be acquainted with within a

period of time. It's in stages, what he or she wants to expose to for a particular period of time with the level of education.

Interviewer: Thank you, any other person.

Interviewee: curriculum can be simply stated as in stages or guideline that needs to follow up in an educational career.

Interviewee: curriculum can be defined as a lay down target to be taught in electrical installation in a section at a particular time of the students.

Interviewer: Thank you very much. Purpose of the curriculum

Interviewee: curriculum are arrangements of the skill involve in electronics, we have several components the curriculum will state clearly the areas in the course of training for skill acquisition and for further studies in electronics , so curriculum is a lay down guidelines towards bringing the achievement in the course of training.

Interviewee: I can even add to it that curriculum is a breakdown of complex, the complexity of the subject to be taught we now break it down into pieces to the level of student at a particular point in time, for instance, in electrical installation we have three modules as it is now, we have the industrial installation, we have domestic installation we have electrical engineering and winding. So, all these things cannot be accorded to students at once, it has to be broken down for a particular level which will be a prerequisite for students before other ones can be built upon.

Interviewer: Thank you very much

Interviewee: In addition to that, according to the curriculum, the guideline is sub divided into different stages we have telecommunication which is under computer and telecommunication, and we have electrical aspect, this is the power aspect of electrical department, the guideline curriculum is stated in the electronics from the first stage and then to the next one which is computer of power and the other phase we have the rural development, rural installation.

Interviewer: Thank you very much.

Question no 2: Could you please discuss how technical, communication, literacy and problem-solving skills are taught in electrical installation program in technical colleges. We have some skills technical skills, communication skills, literacy and problem-solving skills how are they taught in electrical installation program in technical colleges in Nigeria?

Interviewee: well in terms of the literacy, the electrical installation is being taught using a chart in disseminating the information, what is expected to know in that particular area, using charts, using photographs in form of teaching aids.

Interviewer: Thank you very much.

Interviewee: in term of technical skills, the electrical field according to engineering terms we base on regular practice, we are using different methods of doing the practical, we can use the motor to detect the fault likewise the capacitor or rotors we can also use it to the movement of the circuit of deflession.

Interviewee: I will still come back to the issue of curriculum to chook in my own view, you see the module has been designed in electrical department into various stages of learning, now we have some certain students when you enter into a technical school, your first term in that particular in the school will be taught theoretical aspect of this electrical installation then after this the following term has been designed that the student will be permitted to go out to Craftsmen to acquire practical knowledge or skill of this work, after this they come back again then they will now be fed with some theoretical aspect and Practical aspect of this course, so I believe that with this, those areas we mentioned will be taken care of.

Interviewee: so training of students towards achieving the curriculum has been guided with scheme of work which on termly basis has my friend has spoken earlier that the area to concentrate on academically at least for a

term, the following term will be on skill acquisition will be completely practical aspect of the scheme so after that both the theoretical and practical aspect we will now evaluate, how far the students have gone on their training are they good on conduit wiring, are they good on surface wiring, are they really applying what they have achieved during their industrial attachment bringing all this together is what we use to evaluate and examine them before promotion can take place in electrical training.

Interviewer: Thank you very much.

Interviewee: if I can come in sir, based on what we have been discussing so far, the Practical is mostly achieved by mixing with those in the field, because it is not even possible to get the so called equipment for rural electrification cannot be carried out in the college unless you meet with those people on the field, so both in the class if the theoretical aspect of it is taken in the classroom, the Practical aspect will be taken outside with those on the field like the electrical industries, the power holding and those in the field or outside.

Interviewer: Thank you very much.

Question no 3: Could you please describe how you design the curriculum guiding the electrical installation program how do you design the curriculum?

Interviewee: in questions we are being asked since morning are being interwoven there is no way we talk about this one out without referring to what we have been saying before, if I want to design the curriculum for electrical installation a technical school, now bearing anything in mind that this students, we consider them as if they don't know anything about this course before, so we have to introduce this course to them, one as I rightly said that time that this course is categorized into three modules we have according to the body guiding technical education it has been categorized into three modules where we have the domestic installation and maintenance, then we have the industrial installation and maintenance,

then we have the electrical machine and windings, so the students will be introduced firstly to the domestic installation which is very simple to attend to, what they can see within their vicinity, anywhere they go they will be able to do one or two things in that particular area like their houses, your office and there on. So after evaluating them we are going to teach them a little bit further into the industrial installation where machines are being used, machineries will be in place for them to be able to see and know what is obtainable in the industry, so from that one now we go to the third module which is the electrical windings and the machines, so you believe that if those things are taken step after the steps or one after the other the students will be able to get this thing very well without the complex before the simplest.

Interviewee: In terms of that or in addition I think from that simplest, I terms of that simplest before they close the complex one so you start with the safety, the curriculum has to start with safety precautions then the least of the equipment's, the least of the equipment will follow then after that it will go all along to the complex area.

Interviewer: Sorry if I may come in who is in charge of designing the curriculum guiding your program?

Interviewee: The national board for technical education they are the designer of curriculum used in technical schools.

Interviewer: who are those people in the national board for technical Education?

Interviewee: I think experts are invited to the technical education board office before the intervention of the body who awards certificate to participants of the designed curriculum, they are based in Nigeria and there is only the curriculum design that is been passed to us here for implementation and we need to follow the content of the curriculum from simplest to complex.

Interviewer: Thank you very much.

Interviewee: in addition to what he has said already according to before anything will be able to commence in the electrical field there are also some pre knowledge like the physics aspect in terms of physics we have the electricity, then being in the consideration of physics then what they are saying we start from the simplest to complex that goes like the example of the topic like transformer, capacitor those topics we are going to first treat before moving to the complex one where we will be taking about A.D., U.F., R.F., i.e. radio frequency and other parts then moving to the electrical aspect of it like we have underground conduit, trunking and other areas cause if they do not have the pre knowledge that is they don't have a solid foundation they will not be able to understand the practical aspect.

Interviewer: Thank you very much

Question no 4: how the current curriculum guiding your electrical installation program satisfy the skills demand by construction companies, your current curriculum that is guiding your program the electrical installation program in technical colleges here how it satisfies the skills demand by construction companies.

Interviewee: in the first instance the aspect of field training or industrial attachment will add to their experience and at the final stage when they have the necessary examination like National technical certificate examination at advance national level examination, all this coupled together when they are in need of it, they employ them and I think is at the level of employment am talking of the employment, as you know we have categories of employment may be the artisans so all this will add to the skill experience and when they are employed they will add to their what they are in need.

Interviewee: Any way if I may add to what he has said I will not say that the current curriculum actually satisfies the skills required from the construction company, I will not say it that it actually 100% done that but to some extent like 50 to 60 percent of the content in the curriculum actually prepares the

students for the demand required from the construction company, we have low spec that they can agree to it is because the students are given the freedom to go on Industrial attachment before they complete their education but what all this students go to the company to have their industrial training attachment of the experience that they are supposed to gather and this skills will not be actually gotten so only few students could have this opportunity to me the little that the curriculum as actually provided is not enough if I want to measure it up is not enough for students to actually acquire the skill demanding, but I believe that even those construction company will have what we call graduate trainee that if this students are employed will have the perquisite knowledge that they need so they can also undergo training in such a construction company for them to know that is obtainable in that place before they can be given full responsibility as a worker in that particular company.

Interviewee: in addition to what he has been saying the industrial training fund has been feel his responsibility to provide training for this students they have failed woefully cause those good days they are training here and there, seminars here and there for electrical students and for other students in the electrical field but nowadays there is nothing like that the only training they have now is only based on the school and the industrial attachment they carry out in some local areas and see our discretion in Nigeria every factory bus folding up to other place due to lack this type of what we are talking about yes skill, and I don't know what is coming up tomorrow in this present situation maybe there will be improvement in few years to come so that you sir.

Interviewee: in addition to what my learned colleague has said earlier the civil engineering company or construction company always welcome the technical students one the technical students, the body always welcome to obtain the body certificate at the end of the course year in Nigeria while UK is called city and guide it is almost equivalent cause they believe that these people will be needing focus on Practical compare with those ones in

University, they are making focus on theoretical aspect and like the Polytechnic is also doing some of what the technical school is doing I cannot even state their meeting up sir even the polytechnic you are referring to because even the Polytechnic they do more of theory that Practical and because of the act they are being organized for people to in the Nigeria cost of education what they state there is that they are meant for the Practical aspect of the work but to State the fact government is not doing their best because what is required in those areas are not actually provided now you could imagine the environment where they want to practical's on motors and even in the particular school at which as it is now they cannot find more than 2 or 4 motors where we have plenty of students offering that subject how could they be taught effectively, how could they understand the Practical aspect effectively to me the Nigerian government has failed us in this aspect forget the polytechnic is giving us Practical aspect but the technical is now causing in technical schools now and if the government can do their best enough to keep the equipment are not in place and if that one is given to us I believe we can be better than before.

Interviewee: in addition to what my boss has said according to the name technical we base on technical and is I'll continue from where I stopped that polytechnic what the technical students will do the polytechnic students cannot do that because in case study like a type of construction developing a road from Urban to rural area they want to generate wire from the power station to the rural area the Polytechnic students cannot mount the poles while the technical students quickly do it cause they are so strong compared to the Polytechnic in terms of their services can you say it is based on the orientation being given to them.

Interviewer: even technical colleges have it and polytechnics they are the same radar if you want to make a better comparison, I could have been better between technical colleges graduate and University graduates you understand that is in my own opinion anyway.

Interviewee: you may be right, I will not say you are actually right am talking from the experience we observed or we get from the present term now, now I could remember our fathers then in the 70s then the curriculum they receive was so intensive compared to what we are facing now even in polytechnic sir because I passed through polytechnics as well and I noticed that the practical aspect of what we are talking about only in the area of industrial attachment. That is where I gathered most of the experience I have not even in the school we are only shown the pictures or diagram how things are done we will only be shown the diagram and people will ask and been told that we are been e posed to Practical in polytechnics of which is not or though the policy has said that we should be posed to Practical bit the government is not putting enough efforts to get those equipment for us although there are practical included in the time table for us during that time we go to the workshop all we could do is for them to explain even what is to be done practically and explain to us in theory aspect in actual sense it has not been followed to data. Well until the people who directs policy in Nigeria they come to realise that technical Education is the basis of any Education Development because experience has shown that the man power to carry out the curriculum design most especially in electrical Department and it's not there where we need to have like 3 or 4 staffs is only a single staff that is available and the one available is not where is catered for in objective there is no leave bonus, promotion will not come on time until 3,4,5, years they are not even being promoted then an hungry man is an angry man so the curriculum designed is a lot expert have wasted their time in designing the curriculum and have not come to reality the policy has somehow been jeopardize by bad implementation by bad management, potentials there are a lot of well committed people but the opportunity has not been given to them cause I as a person I have been working here for the past 28 years and the electrical department has the largest population whereby the place has to be monitored by five good assistant we need workshop assistance, we need technical instructors that will carry out the curriculum design all this one to know so what are we saying when we say the students are there for

good 3 years what is supposed to be acquire within 3 years is not acquired it is just a wasted effort, so we are only crying that may be God will have divine intervention so that we are not receiving our blessings in the grave yard cause all efforts we are making is only God that can make it come to reality.

Interviewer: Thank you very much. Can you please explain how you teach the whole curriculum guiding your program, how do you teach the whole program?

Interviewee: it is broken into scheme of work in electrical installation we break it down to the easiest way then is being taught weekly. The curriculum as it is I can say it is the big umbrella that actually brings the acquired skill together what we now do is that we break it down into number of weeks that we have in a term then the number of terms in a session, then the number of years that the students will use I. Acquiring that thing so what we do is after it has been broken down we teach the students on weekly basis and we make sure that we cover the syllabus that is meant for a particular week that should be covered over a period of time for students to acquire the knowledge. In addition to that we normally disseminate the curriculum weekly first after then we try to meet up the curriculum before at least 3 months and the last month will be for examination before the three months, maybe before two and a half months we try to meet up the scheme of work, after then we go on Practical from the first topic to the last one we start doing that after then they go for an examination we evaluate the students.

Now some people we call them clusters this people the experts in this field will come together having set the curriculum now they will now use their knowledge, they come together they take the curriculum and break it down in to simplest form and to syllabuses or scheme of work, then on weekly basis then they break it down after that it will now be sent to the teachers the instructors the various schools so they now follow the scheme of work the contents strictly and anywhere that we see any type of corrections there we will now use our own discretion to give it absolute justice in those areas and we have been trying our best and the students in many years have been

Graduating or we have been seeing the best out of the best. Further to buttress what he has said now, we have 3 terms making a session and in each each class, each each session we have most students they will have to be in class for two sessions and the last session they go for an industrial attachment in other to have experience in a session now we have three months to disseminate the scheme of work to them and the scheme of work had been approved by the ministry of education weekly after that we then do or make our own justification now that is where we are aware of Practical to have the experience of what they are been taken in the theoretical aspect. Thank you, sir.

Interviewer: Thank you. Lastly on the questions could you please discuss ways of improving the curriculum guiding electrical installation program in area of technical, communication, literacy and problem-solving skills, how do you improve the curriculum?

Interviewee: sir I will still come back to one thing sir one of my colleague said something where are supposed to have four instructors we have only one that is we are over using that particular person, at a point in time that person will be tired so what we can do to improve this part of curriculum to make it work we need more manpower so we only appeal to the government to actually assist us in getting more staffs to the colleges we have division of labour across the years where we have year three classes so that each instructors is going to face his work squarely without facing any problem, the person who has been over used will complain and cannot have 100 percent deliverance, so in that regard I will say that the government should help us to get more instructors then the curriculum the preview is to be reviewed to decide if it is on every 3 years having seen from the evaluation of the students how effective the curriculum is then you have to view it where to remove or add will actually help improve the content of this curriculum. In addition, sir. In order to improve the curriculum I think constant training is highly needed on the man power I mean workshops and seminars, when they are constantly trained it results to new technology it

will improve the curriculum in terms of teaching the electrical installation in addition provision of equipment to train in the department of electrical installation is necessary I think with all these it will improve the curriculum in electrical installation program. The major problem is the equipment and also the man power they are not motivating the staff with incentives, instead of paying them what they are supposed to be payed is nothing to write home about, the available equipment are due for service we have some machine that needs maintenance is outdated, we need to have some division of the staff in terms of wiring, domestic installation, we should have different staffs there those are the challenges that we encounter in the process of juvilating the scheme of work they've said it all the monitor the reviewing maybe on a yearly basis or 2,2, years.

Interviewer: how often do you review?

Interviewee: they can be done through questionnaire every term or session whereby we dispense the questionnaire to them with the data we will be able evaluate them, from the concept of what you asked now how often do we review now by the virtue of the program is done 2,3 years that we do it even that 3 years I want to tell you that the even this year the curriculum is due for review and it has been more than three years we have been using It and it has not been reviewed, so who is to be blamed if not for the body in question even, but we will be saying our own here they are there for them to execute our own particular, if they eventually execute it so what do we do we wouldn't we will lose what we are being supplied to teach the students so God will help us in this country. Amen.

Interviewer: Thank you very much, without missing words I will like to thank you all once more, thank you for the participation, your contributions will make a valuable to this research. You are all welcome thank you.

FGD 3 TRANSCRIPTION

Good morning all, you are all welcome to our session. Now to the research assistant.

Interviewer- Without wasting much time, let's go to the question we have. It is a discussion group, focus group discussion, there are no wrong or right answers, just give me your views concerning what you know about the questions.

The first one is for us to discuss what you understand by the term curriculum and you should please explain the purpose of curriculum in the program of study

Interviewee: I'm one of the instructors, I've taught electrical installation for over twenty-five years

Interviewer: You are welcome, thank you. The next person.

Interviewee: I am one of the participants. I study electrical installation technology

Interviewee: I am one of the participants

Interviewee: I am an instructor in electrical installation

Interviewee: I am an instructor in electrical installation

Interviewer: You are welcome, thank you all. Let's go straight to the questions.

Number one question.

Will you please discuss what you understand by the term curriculum, and please explain the purpose of curriculum in a program of study. What do you understand by the term curriculum? And you should please explain the purpose of curriculum in a program of study. We can pick it up from anybody.

Interviewee: When we a curriculum, it's the set of General programs, set up of course of a program a student on training is expected to go under for a particular period of time and tend to get some certain certificate. For example, in the technical college here, the curriculum we are making use of is developed National Development of Education curriculum set up by a technical body in Nigeria. They created the program for the national technical certificate which the examined body of education, so the previous program is run for three years after which the student seat for the exam called National technical certificate exam after the three years.

Interviewer: Thank you very much, what's the purpose of curriculum in the program of study.

Interviewee: Purpose of the curriculum is to enable the school to know the set of the topics the student will be taught for a particular period so that which at the end of that term, of that program, such student or that training will be employable in the industry either construction or mechanical industry. The curriculum includes some certain things that are needed in the industry so that when the students are in, they will first give them the basic training, such as electrical installation. They will first have the basic knowledge of that particular part of electrical installation that is the basic technical knowledge. After they go for industrial advancement training for eight months out of that three years, after then, they can now be employable in the construction industry or any place where their service is needed.

Interviewer: Thank you very much, please contributions.

Interviewee: I want to add something, curriculum as per College, is broken into let's say three, into skill rather, whereby the subject to be taught will be analysed or outlined before any teacher move to the class and teach that topic. Curriculum as a whole, is broken into skill I told you whereby the teacher is working on a weekly skill on a weekly basis whereby the teacher

will take any subject he or she want to teach, will be taken and taught in the class based on curriculum.

Interviewer: Okay, thank you.

Interviewee: Also, curriculum can be taken into grade approach to us teaching and learnings by a student as organized for us by the National Board for technical education has granted and which is also being certified by the ministry of education has been pushed down to the teacher so that they can be just like what my colleague has just said for a student to able to gain some skills which can be used, which they will take as knowledge into the field to practice the field of specialization in the electrical installation field.

Interviewer: Thank you, what's the purpose of curriculum in your program of study, in electrical installation?

Interviewee: Like my colleagues have said, the purpose of the curriculum in reference is for a teacher to know the type of topic for the student to be able to know, I mean the topic for the teacher to teach the student, that is no one, more also, it's just like a guidelines, is a lay down roles that the teachers have to follow for the students to know what they will be grabbing from the teacher.

Interviewer: is there any difference between scheme of work, note of lesson and modules. Because you people said that the curriculum is broken down into scheme of work, from there can be broken down into the syllabus, modules or whatever, do you do that in your program of study?

Interviewee: Yes, curriculum is broken into syllabus, from syllabus to the scheme of work and the scheme of work is broken to pieces, before any teacher and teach.

Interviewer: Thank you very much.

Question 2: Discuss how technical communication literacy problems solving skills are taught in electrical installation program in technical colleges. We

have technical skills, we have communication skill, and we have literacy skills and problem-solving skills. How are they taught in electrical installation?

Interviewee: Electrical installation, all that has to do with the practical aspect, while the communication skill has to do with how the students will proceed on the main practical. Let's say a point of fact, now the teaching skill and communication skill has to do with this is how we do it. You outline we the socket switch will be installed or mounted before you connect into the joint box. That is based on communication skill but the skill itself has to do with how the students will carry out the practical skill. Communication skill has to do with the communication between the teacher and the students while the communication between the teacher and the students while the practical skills will be done by the students from what has been taught based on communication skill

Interviewer: Where do you apply literacy and problem-solving skills?

We are still on the same question

Interviewee: literacy skills are better solved by English teacher, but electrical skills are taught by the basic electricity teachers. While electrical skills are been taught by the electrical instructors or experts and they are taught in a psychomotor way in which the student are being encouraged to perform the skills to perform the skills and which case open down into pieces, sorry for instance, if you want to teach a skill one point light all the teachers has to do, the psychomotor will tell you that the students learnt and practice whatever their taught in a skill and perform coloring the teachers experience on carried over by the students.

Interviewer: Thank you very much, any other contributions?

Interviewee: We know that this electrical installation has symbols and first should now when you want to ask for something at large, now you know that you are in electrical installation between those that are undergoing those that are doing it informal training. And the issue of literacy comes in

with diagram with the accountability of the students that is how you now teach the student to be able to identify symbols able to read simple diagrams so that they can now make use of that one. When they are doing this attendance skills that is the practical aspect of it. The ability of such students to be the able to interpret those skills, so that's the literacy skills that we have so through symbols and life experiences.

Interviewee: If I can hear you very well, you know the entry qualification of the student matter most now, let's go into consideration who joined the pupils in JSS3 and those in SS3 , you know their literally ability will be quite different from each other , those that joined the school with SS3 would have passed through the science class, say physics another integrated science subject like that , then to compare with those who enter through JSS3 and you can see that knowledge of understanding will be quite different so they will acquire more of literacy knowledge till other classes like English, the basic science classes and all that then couple with what she have just mentioned now. Symbols and all that, then the practical aspect which I know very well that they will acquire more knowledge than through the craft made around that is when they are sent out for Industrial attachment, so that one will contribute more to their practical knowledge, so they will be able to see very well will be expose to practical aspect of the job like house wiring, street lighting and all that which is not practicable in the college, you know we cannot just tell them to go and be mounting poles now, so that's my own contribution

Interviewer: Thank you very much, any other contribution.

Interviewee: Question 3

Please describe how you design the curriculum guiding electrical program, how do you design the curriculum guiding the trade, how does it go

Interviewer: Well in designing such a curriculum, we first look at where the training is going to be useful or going to be employed such like industries, we look at what will they require from the industries.

So, having this one in mind, all these ones will also be included in the curriculum, what they are going to do in the industry, so that they will have the basic knowledge. That is one, then secondly, their basic qualification is also to be taken into consideration that is when we areplanning them, are they JSS3 students, and are they SS3 students. That also will be included into the curriculum. What does the industry want in the area of the field and the type of certificate that they are going to obtain at the end of the program, and designed in the curriculum?

Interviewer: Who are those that design the curriculum?

Interviewee: In designing the curriculum, we have the National design experts in area of electrical installation then they draw from the industry, from the ministry, from the colleges and from the University institution. So somewhere that the course is taken place in the industry and in the ministry of education.

Interviewer: Thank you, any other contribution.

Interviewee: None sir.

Interviewer: I want you to say something, you must say something. If you are called upon to design a curriculum, what are those things you have to put into consideration?

Interviewee: The need of immediate environment, just like Nigeria where you have sickle cell of electrical power supply, so we need to, then the other one , the need of the National as at that period but now in Nigeria we don't have enough political power supply, then the other one , they need ordination as at that period. So, we need to design what that will benefit the immediate environment and the Nation. Because the industries are running down because they are not enough technical power supply. Then the other one I think it should be put into consideration is the students itself. We have to know the type of students to be admitted into the school. It maybe

Nigerian cable, you know that one is quite different from cable metal, so their knowledge of understanding is quite different from each other. They have to check for the facilities around for the type of training of a program to be run.

Interviewer: Alright, thank you.

Question 4: How does the current curriculum you people are using in the college guiding electrical installation program satisfy the skills demand by construction companies.

Interviewee: I think the curriculum satisfies the construction companies, I know one thing now that instructor of sound will break it down and bring all the other things that is necessary wherever there is a need for any improvement in the curriculum. The instructor will immediately adjust his current to suit the needs of the society, the needs of the college and the retraining of the students. In order that, they can adequately acquire the skill that and they have brought him to acquire and they can be beneficial to the student and the society at large.

Interviewer: In another form, do I say does your current curriculum satisfy the skills required by the industry.

Interviewee: It satisfied it in some areas and in some areas, it need improve and the areas Infrastructure. The curriculum still satisfy the part of infrastructure but in the area of operating now the cost of ICT , we are now in the computer age now so in development of the operatives we need an improvement in that curriculum, the computerized operated equipment that is , should now be use to teach the students, how to be able to carry out the repairs or to be able to operate those things because most things in the olden days they are being operated by but this time around there are computer operatives will need to improve our curriculum especially in the area of construction and some other things that also satisfies

Interviewer: skills demand by the construction industry.

Interviewee: To me sir, I know the curriculum has already takes care of all those things we are talking about now before it was not well funded because in a situation where we are still using obsolete tools and equipment to train this children in this supersonic age, it does not really help the situation but the curriculum is not faulty but it is not funded, so as to get the feedback, the required feedback, so that is my own observation. Because this time around when we are all computer literate and we are still using manual, try and error method to detect fault.

Interviewee: No that is what is inside the curriculum not from the area of the area of the operatives. In the area of the operatives, most of the machines we are using now, there are computer programs, that is the mode of operation in nowadays and that is not yet in our own curriculum.

Interviewee: That is what I mean by not well funded. if it is well funded, it will bring all the needed…

Interviewee: If it is in the curriculum, we can now demand for it, the present curriculum did not include all the areas of computerized aspect.

Interviewer: It seems the curriculum is faulty?

Interviewee: Yes

Interviewer: To some extent, thank you very much. Madam you are not contributing, I would like you to talk, please.

Question 5: Explain how you teach the whole curriculum guiding your program, guiding electrical installation, how do you teach the whole curriculum? There is a curriculum set aside for your study, how do you teach the whole curriculum.

Interviewee: Actually, as we have discussed earlier. The instructor has broken down the curriculum schemes and syllabus reachable to the students. So, after at the beginning of the session the instructor concerned,

prepare and write out the lesson note for each week and the scheme guiding the instructor for every teachable process in the weeks, at the end of the term.

The students are examining to enable the instructor to know how much relevant the students can be in the next class. And when the student get to the third year of the session, then should be able to write the exams and giving the opportunities to test themselves by the government paying for the exam. They write their external examinations satisfactorily.

Interviewer: For me, the curricular is teachable by breaking it into syllabus and scheme. Through scheme one would be able to teach the students effectively

Interviewer: Any other contribution? Why are you not talking?

Interviewer: Your level of experience is how many years? How many years in service? Okay.

I think if you are saying how we teach the whole curriculum, if I'm not assuming, I think technical colleges are three years program. So, the curriculum has to be broken down for three years, for first year, second year and third year , probably you are doing surface wiring, conduit wiring, industrial wiring, winding and some other aspects like that in industrial attachment and you are running termly program, what do you call it , thirteen weeks in a term, yeah. So, it must be broken down again.

Interviewee: For the first aspect, it is electrical installation basic, and for the next one is industrial is basically in second year, while third year it has to do with windings and majorly industrial.

Interviewer: Thank you very much.

Last question**:** Discuss ways of improving the curriculum guiding electrical installation program in area of technical communication literacy and problem-solving skills, how do you improve the curriculum.

Interviewee: Just like I said that time, I thank the government for being concerned. And for finding the program so far and we request for more like Oliver twist, for more funding by the government. I think if there are proper funding, there are recent equipment to diagnose forms and recently I think for electrical installation will now be available. I think the government can still improve where the students have gone for Industrial attachment have to diagnose some forms. That's why I say it could be the problem of funding the curriculum.

Interviewer: Thank you

Interviewee: In my own contribution, if we are to look at it from the right direction, more manpower is needed to improve the scheme because there's real shortage of manpower and in the area of communication skill, we need more manpower into the area of technical aspect. I want government to fund it very well. This so called electrical is no well-funded at all because I can see all the equipment's are obsolete. I want to tell you we cannot compare our training to other countries, so we need more manpower, we need proper funding of the electrical department. Thank you.

Interviewer: How do you improve the curriculum guiding your program?

Interviewee: From what he has just said, firstly we need to improve the program we need a machinery in terms of when we have the people that are ready to learn the electrical installation. We also need the readiness of the people to study the electrical installation

Interviewer: Asking one of the participants how do you improve your curriculum?

Interviewer: We are all teachers, one way or the other we should have gone through some educational courses, curriculum to mention. So how do you improve the curriculum guiding your study?

Interviewee: Well one, we look at the curriculum that we are using in the school and in the industry, what they need. If there's any area of deficiency there, will improve the curriculum that is one.

Then secondly, the problem now, teaching of the curriculum in the school technical colleges nowadays lack manpower, that is, they are second class teachers so in the area of that, we should get more manpower to teach the students, then in the area of the technical skills, we don't really solely on the practical of the school more so, we really work on the industrial attachment the area of the students they are going to work. Now, in that area I will suggest that the government make use of private participation that is, the students will be on for certain periods in the industry let's say for three months, and then they will be in school for three months. After teaching them they go for practical's all what they have learnt in theory, they make use of it during practical. After that when they now come back in the areas of Industrial installation like rewinding, repair of electrical machine. That is being in the industry for certain periods then go and come back to that one improves our curriculum. That is to be able to teach it effectively, then the other areas that if there are services being in the industries that making use of this. That is when the students finish then they can be employable.

Interviewer: Thank you very much, how often do you review your curriculum?

Interviewee: Well, since we are in technical college and it's a government school, the federal government is in charge of that. I think since the past five years it has not been reviewed but the curriculum is expected to be reviewed every five years. The one we are using now is quite long we have been using it.

Interviewer: The one I collected from one of the technical colleges is more even than ten years. It has not been reviewed. So, it's obsolete.

Interviewee: Because it's electrical installation there are not much qualification compared to modern courses. Where things are changing on

daily basis in electronics aspect. So electrical installation that one there are minor changes except the operatives. Based on electronic changes. But in electrical installation, the way they are doing the wiring is still the same thing and there are no robots to do it.

Interviewer: Robots have been doing that, I will tell you,

Interviewer: I've seen robots doing wiring. I'm telling you robots are now being engaged.

Interviewee: It has not come to Africa.

Interviewer: Thank you, any other contribution? What do you want me to tell the government?

Interviewee: They should fund electrical department very well. We need more fund to maintain the trade. More manpower, plenty chance and the environment, they should identify technical colleges, they should not equate technical colleges of education to secondary school wherebythey feel like the way they teach in the secondary school is the way they teach technical college. So that one shouldn't be.

Interviewer: Don't you think you need retraining?

Interviewee: No.

Interviewer: conferences, seminars, workshop so that you instructors too will not be obsolete.

Interviewee: The students have been taught before going to it, but they don't have the materials, equipment but we are telling them the theoretical aspect. So, we need more equipment's and it should be modern one.

Interviewer: Thank you very much, haven't said this. I will say thank you for your participation, your contributionswill make a valuable contribution to this research, thank you very much. You are all welcome. Thank you.

FGD 4 TRANSCRIPTION

Good morning all, you are all welcome to our session. Without wasting much time, let's go to the questions we have. It is a discussion group, focus group discussion, there are no wrong or right answers, just give me your views concerning what you know about the questions.

Interviewer: let's go straight into the questions please what do you understand by the term curriculum and what is the purpose of curriculum in your program of study individually?

Curriculum can be seen as a guide to a teacher, a guideline for teachers to actually follow, if possible, follow the topics subtopics and what and what to be achieved is called curriculum.

Interviewer: What's the purpose of that curriculum?

Interviewee: The purpose of the curriculum is to enable the teacher to be able to achieve the set objectives.

Interviewer: Can you please mention the stated objectives you want to achieve.

Interviewee: The topic, let's say a transformer, you know that a transformer is an electrical device. At the end of the lesson, students should be able to identify different types of transformer, the functions of the transformer all these are set objectives.

Interviewer: Thank you very much, we welcome individual perception about it.

Interviewee: Curriculum is attached to academics directly on how to achieve direct goal on what you need to teach the students on certain years of their topic. In technical college now, we have three years, our students will come from junior secondary school JSS1, JSS2 and JSS3, the curriculum is spelled out. We have to consider the learner and study the environment at which you are to carry out this. The curriculum must go with one topic or the other,

you have a directory, you have somewhere to go, you should focus on the students themselves which is the learner, at the end of the day, you'll have to achieve the design that you have spoken to.

Interviewee: Thank you very much sir, based on my own view, talking about the curriculum, the curriculum is the something that is too far, because on a single topic, you might even waste a lot of time before you achieve it. I'm writing a curriculum number 1, as you as a curriculum designer, you have to look at the level of the requirements, what and what, what are the problem that is going around the environment that you want to curb a problem in future. The first topic for me to see as the most important is the safety aspect of that curriculum, the safety of the students and also the environmental safety for all topics under safety, you have to enable the learners and the instructors to be conversant with them whenever problem arises, when I talk about materials now, for example in electrical department where there's no electricity and you want to teach a particular student with the skills to and no electricity in the village, you must look at structures on ground, people that will be able digest the topics and subtopic and that they can be able digest it into the class. So, you must put that manpower in place. Then number three, the importance of the curriculum you are designing, talking of power in electrical electronics you cannot do without power, for whatsoever you must provide power, look at the environment, how would I put my power, is it by however you want to see available of power, you have to see to that. Second is the diagram, what are the diagram in place. If look at that one, you can be able to tell the students, then never the less, the objectives can never be overlooked, I'm I going to produce engineering, mechanic or whatsoever, so look at the end it has to been place , then you look at the level, then the duration of the program. I am designing this curriculum to be covered in one year or two three years, in technical education there's no program that is above three years and above. Then the intended trainees, what are the intended trainees? I'm I going to be

transferring my curriculum, knowledge, skills. Or to the elders, so on and so forth.

Interviewer: Thank you, any other person?

The materials , as you are designing will be thinking of the kind of material that should be available are objectives of you designing the curriculum, and the environment which you are intending to start the designing then first, if you have drafted the content, taking the cognisant of you are expecting to cover , this content should cover, then you pick it , is two terms in a session or three terms in a session then before you begin how to split the content into term, at the end of every term, so this is just I try to add.

Interviewer: Thank you very much

Another question how the curriculum guiding your program. How does it satisfy the skills demand by the construction industry?

Interviewee: In Nigeria, our technology is not fast developed, most of the companies in Nigeria are 40 years of age, 50 years of age our technological system are changing are changing in computer age and all but other construction companies. And the kind of a table we are using, when you try to remove the old one, try to replace it with a new one. Most of the organization, all they do is the replacement of bulb, replacement of tables and all of that.

Interviewee: who are the designers of the curricullum you use, they don't involve the instructors, they involve doctors, engineering who don't know the problems of the graduates, implementation now will become a problem but of people at this level is invited to design or develop a curriculum, if you somebody from University or a polytechnic who don't know your problem you will just design what you feel.

Interviewee: It's not that they don't know, they are designing the curriculum to suit themselves, and they are not thinking of how to handle them here, that is why they are designing.

Interviewee: what I think another problem is implementation.

Interviewer: How do you teach the whole curriculum guiding your program, the whole curriculum guiding electrical installation program, how do you teach it.

Interviewer: i think the whole thing goes through everybody.

Interviewee: one problem we are facing is that initially there are some instances pointed out, we do have this component like in electrical installation work we have domestic installation and has its own scheme of work even Industrial installation also has its own scheme of work then binding of electrical machine has his own scheme of work and the end of the term or session which is three years they have an examination then along the line the exam body itself is giving us problem. Showing weak age of manpower indifferent department we only have two staffs in all which we are supposed to be up to five.

Interviewer: Thank you very much.

Interviewees: you are welcome.

Interviewer: finally let's discuss ways of improving the curriculum guiding the electrical installation program in all areas of skills you have mentioned technical, commutation, literacy and problem-solving skills, how do we improve the curriculum guiding those skills aspect?

Interviewee: the curriculum body itself a technical teacher should be involved when designing a curriculum, the national body should always involve the technical teachers. Because since the technical teacher is familiar or has knowledge about those things inputted in the curriculum it will aid the designing of the curriculum.

Interviewer: Thank you very much.

Interviewee: From my own view, the problem of Nigeria is the I don't care attitude, by the government of the country, you find it difficult afternoon

tertiary Institution you find it difficult to have an employment, unless you are going to employ yourself, government should provide materials, in tertiary Institution, you will only acquire the theoretical knowledge and secondly, the exam body are supposed to be invited like my colleague has just said. I think of government can give adequate attention to technical school it will be good.

Interviewer: Thank you very much, any other contribution for improving the curriculum?

Interviewee: They need to invite qualified professors in the field

Interviewer: Professors are qualified

Interviewee: I know, they look at the curriculum as if it's mainly for the less privilege.

Interviewee: That is why I said that like the eternal technical bodies they invites people from different world of life, even our teachers here, they do go to set questions ,now this people will meet with professor when they are bringing their own idea , they will also bring their own ideas because it is meant for them. Let's take an example of I would be opportune today to go to higher Institution. The exam bodies either ministry of education, the external technical bodies come together to review the curriculum.

Interviewer: Haven't said all these, I want to thank you all for your participation, this will make a valuable contribution to this research you are all welcome thank you.

FGD 5 TRANSCRIPTION

Good morning all, you are all welcome to our session. Without wasting much time, let's go to the questions we have. It is a discussion group, focus group discussion, there are no wrong or right answers, just give me your views concerning what you know about the questions.

Interviewer: Thank you, you are welcome. I will go straight to questions one.

Question 1: I will like us to discuss what you understand by the term curriculum and please explain the purpose of curriculum in your program of study, what do you understand by the term curriculum?

Interviewee: well curriculum is the total experience of students in a school likely to go to undertake a course for a period of time scheduled for academic activities to help, so nobody will regard curriculum as nothing because it will be there that is my own understanding about curriculum.

Interviewer: what is the purpose of that curriculum?

Interviewee: it is like a guide curriculum is like a guide at any point in time tells what is to be done where you, and what time academic activities are to be carried out in an electrical installation program.

Interviewer: Thank you very much.

Interviewee: it spells out what is to be done and what time the job is to be done.

Interviewer: Thank you.

Interviewee: As earlier stated is set out objectives of what and what to be done in a school, what to be done from one stage to another stage throughout their learned period.

Interviewer: And the purpose of the curriculum.

Interviewee: Purpose of the curriculum is to guide the school so that they will not derail from the stated plan or objectives they have for the session.

Interviewer: Thank you, what is your own view on what curriculum is?

Interviewee: actually from my own perspective curriculum it is something that as to do with time and the total experience that a student is supposed to have right from the first year to the final stage this are done for the terms and letters breakdowns into weeks so that a student from one stage to another stage up to the end of the course.

Interviewer: What is the purpose of curriculum?

Interviewee: The purpose of curriculum is done to make sure a professional student has or ascertain the 2 term activities that has to do with a profession at various intervals.

Interviewer: Thank you very much. what do you understand by the term curriculum and its purpose?

Interviewee: curriculum is prepared and laid down to expectation for particular effect of growth of a students to have a certificate like we've heard from other people, this curriculum is laid down so that anytime we know that this is the standard that one is expected to reach and are followed and universal sketch designed for every stage at that level.

Interviewer: What is the purpose of curriculum?

Interviewee: and the purpose is to ensure that anybody is certificate undergo a same learning and is a guide for whoever who is expected to give out to learn.

Interviewer: Thank you very much.

There are certain skills been taught in electrical installation program of technical colleges, majorly in electrical organisation, we do teach technical skills, communication skills, literacy and problem solving skills how do you teach them, how do you teach those things in electrical installation, technical skill, communication skills, literacy and problem solving skills?

Interviewee: to me all these three major parts you stated are to be considered even during the planning of curriculum, that is when we go with these three things, that is why teaching us being classified into two we have the theoretical aspect of it and the practical aspect of it, for the theory that is why the literacy and other skills that have to do with theory aspect is attained while doing the practical majority of the achievement is the skills acquisition and the students were given time for them to understand like when a practical is to be done it has to be given three periods or 45 minutes so that there will be enough time for practical to be executed.

Interviewer: What type of skill do they get in practical?

Interviewee: type of skills in practical the skills ranges from what the curriculum states at that time that is in terms of installations, machine work with as to do with installation, these are the major skills so far.

Interviewer: how do you teach communication skill?

Interviewee: communication skills it goes along with the material and whatever the communication between the teacher and the student and we use English language for communication.

Interviewer: what about Hausa laanguage?

Interviewer: no Hausa, we use the formal language which is English.

Interviewer: sir can you give us your own perspective, opinion on how you teach technical skills, communication skill and problem-solving skills.

Interviewee: practically as you said it involve teaching student work within the trade so one of it is the aspect the student need know under the topic after you cover the theoretical aspect and then come to the workshop to teach the students the practical aspect and the practical aspect because of the topics may require some set of tools for instance if you are teaching magnetism or you are teaching an aspect that require direct electrical installation where you will use some set of tools and some little explanation to the students and create a set up for them to perform a task so in general

you want to talk of how it's vertically by designing a task after learning the task and understanding the tools and the you set or group students to perform the task themselves and monitor them well anywhere they were wrong you make corrections so this is how we inject practical in students, communication normally is not treated as topic or subject in the workshop but the communication is required to enable them understand what is said during class sessions, generally for instance they are going to undertake English language as a course the students are expected to know the basic knowledge of English language and from then you know technical terms are different from what we know in English language and the most the thing the teachers are involved with in the scheme is the technical terms are not the terms you will hear in a English language class so we have taken time to explain the electrical terms and when you talk of language, sometimes it is not english language some certain courses require you to go local languages before they can understand. Because if they don't understand all the explanation and practical then you go local for them to understand so that is how it is.

Interviewee: there is a situation I want to buttress where you look into the entry qualification of the students at times will require the local language will drive in your points so that they can understand your points and after then you know the students that classes, it will be very difficult for them to go back to their level in terms of language because you will not be able to meet up.

Interviewer: what of literacy and problem-solving skills?

Interviewee: literacy this is a broad term whenever you talk of the literacy we are talking of the number of knowledge a student should have in a school that too as we just said a student graduated in the school in the course of doing two courses we can say as detailed at times, we do that because of our average understanding the way the students perform to our lessons in a nutshell we emphasize teaching students, there are some instances where we give student extra lesson on areas you find them lacking, especially in

terms of English language and in terms of areas like social studies or in terms of subjects like introductory technology when we discover the students that are knowledgeable, apart from design, time in the curriculum you now go extra look at the area they are weak and decide to attack so there will be amendment so that's it.

Interviewer: Thank you.

Interviewee: want to talk about the classroom teaching skills, when we talk of the skills in the class especially in the workshop we have to take notice of the student and they have to be aware of where you are, the workshop is different from any other places so you have to be aware that you are in a workshop, what are the things you can find in a workshop, how you are supposed to behave in a workshop, handling of things I the workshop there should be proper handling of things, there are things you need to know, how do you handle it to other students in the workshop, how do you go about any practical you want to do, how do you start, who is supposed to start and at what stage are you to consult your teacher, when we come to communication sometimes we use signs and there are times you employ strategies and tactics when you are communicating with students and you observe that the language you are using is so high and you try to come down either by using signs and any other thing so that they will come down to your level like the skill, strategies is not part of when you plan, they are not in the main plan this comes in the class when you know the method you are using is not going then you have to bring something so this are skills you need to know that will be able to match them together in the workshop, the handling of tools is very essential cause there are some dangerous tool are not supposed to do when they are not aware of it, when they do not have the technical knowledge of it.

Interviewer: Thank you very much. The next question is I want to ask that you should describe how you design the curriculum guiding the electrical installation program, how do you design the curriculum guiding this profession or trade.

Interviewee: You know the guidelines on how the curriculum should look like, what determines the curriculum itself, spell out the objectives by different level is our primary School, secondary school, tertiary Institution and what have you. When it comes to area courses then it is then you begin to relate a particular objectives, and then you set the curriculum based on that objective, those in primary and secondary school we are not involved in curriculum formulation, we are only executer of the curriculum, so for somebody to tell you what and what ingredient use to develop curriculum it will be difficult to say there are this and that.

Interviewer: but who are those that are designing the curriculum for you?

Interviewee: It should have been us. But we at the end here, the interpreter carries out whatever it says. Since we are not involved in designing, we discover many things is either obsolete or out of content, have been teaching experience for about twenty years and during that time. Since we are not involved in designing the curriculum, at any point in time we discover that certain things are obsolete and go out of content because three weeks makes a term, for instance I have been teaching here for twenty years back so the basic things we teach the students are things used as electrical. It is difficult for us to have a say about how they go about the curriculum

Interviewer: Thank you

How do you design the curriculum, I want to hear your own view?

Interviewee: Actually, it is a federal something, they use professionals in various discipline to produce the national curriculum. It is based on the objectives set by the government or maybe introduced by the body itself, most of a us Curriculum is given to us we are asked to use the national curriculum, we have other bodies, which is the National Board for Technical Education. Which we sometimes harmonize, so the national body are stake in the national curriculum.

Interviewer: so, you're not involved in the curriculum. You are not invited?

Interviewee: No we were never invited, our parts to bring it to break into scheme of work to weekly and daily.

Interviewer: thank you very much do you have anything to say

Interviewee: as they've said we are not involved, but all we see in the curriculum is designed such that whoever is passing from those school at this level, would be able to have the knowledge to be able to carry out any domestic place and at the same time further his Education.

Interviewer: Is there any Technical University in Nigeria?

Interviewer: wait , I'm coming what I'm saying that is why I said it's such that you will be able to carry out repairs on this domestic equipment also the industry but you can also use this labour and further your education and go to any level in the electrical field

Interviewer: So, you are not involved in the curriculum?

Interviewee: Yes, we are not involved. It's the one will see we implement.

Interviewer: Thank you, sir how does the current curriculum that you are using currently guiding electrical installation program, how does it satisfy the skill demand by construction companies, Construction industry.

Interviewee: well to some extent while I'm saying this is that in the construction industry most of the demand in terms of skill has to do with the electrical work we know either you have been involved in either electrical wiring, installation, electrical installation of building, whatever so, from the basic the curriculum cover that area the problem is that lack of facilities and be able to carry out the training in all, the students should be able to acquire the necessary knowledge.

Interviewer: Now that there's advancement in technology, take for example capacitors, now you see capacitors having colour codes, is the curriculum stating this? Does it take care of that?

Interviewee: You see what is there, is all depending the limit during training students at this level

Interviewer: Not on the University, a labour test officer two and three noted everything you supposed to know that capacitors now comes with colour codes but it's in your curriculum.

Interviewee: There would be areas the curriculum didn't cover and it's not satisfactory

Interviewer: So, if you are working in the construction company now and as electrical technician, a fan is faulty and you want to repair a capacitor without knowing the colour code, how do you want to do it?

Interviewee: No, it's true. What I'm saying is that there's is drawings under capacitor, if that is what to say the syllabus cover such areas, but what I'm trying to say is that, there's a knowledge higher about what the curriculum say we should teach the students, that is where the problem is but an average student has to Know the stethoscope and soon. What I'm saying in average is the performance of our graduates in our Interest can be okayif they can do all that is provided by the curriculum for now.

Interviewer: Thank you

Interviewee: I actually have to put this into consideration, the issue of theoretical advancement of nowadays but before then, curriculum need to be revisited after certain years

Interviewer: Revisited or review?

Interviewee: Review

Interviewer: Sorry, how often do you review your curriculum?

Interviewee: Before in the 80's it was West African Examination Council, it is not syllabus.

Interviewer: Did you go for city Guide of London?

Interviewee:I did not go for that, I did the General Certificate Examination for technical, so it's the syllabus is what we use to teach the student and the purpose of this curriculum is that you have to complete it and your students are ready to seat for exam and pass. Even now look at external syllabus curriculum and jump to other technical bodies so that is the area of conflict of the national curriculum we are talking about. And the review is not done it can take thirty years.

Interviewer: but the curriculum is obsolete

Interviewee: it's not obsolete but it's the technical advancement we are talking about now, some do jump topics like motor, rewinding some do jump topics.

Interviewee: Excuse me, let me come in. You see sometimes it's very difficult to look at it where we could have problem, in my believe, there are things in my school that are very difficult for me, when I came in to this school as long as you are a teacher and you are able to have enough material, guide like the textbook you can'tget much difficult on it. One other thing is that the industry is different from the school because if you go to industries, there are some things you see them as being new. I recall when I was working with a company, the day they employed me , I met then just trying to remove a motor, they have spent two weeks dismantle, two weeks they were not able to remove it and have never work on that , that day they came tired, we are to go, just a little shake and we removed it, this is something I have never gone through as a student but just because with the experience in electrical, you force yourself to bring idea on how to solve problem not until you are taught how to do it. You come across anything and you use your initiatives and your own skill to bring solutions to it.

Interviewee: So like the curriculum when I was doing my PAGE we talked about this things, who and who are supposed to be involved in the curriculum you find out that this professional bodies like in National Board

for technical educatio they sometimes they are not even involved and there the people to set the exams.

Interviewer: Who are those people that design the curriculum?

Interviewee: We have the Board for Technical Education, they are there. For past twenty years now, we only use our initiative and efforts, we were not trained, and the government does not speak about it. In the 80's it is virtually everything you get in the practical tools you get, it's even surplus. In technical school, you see the vice principal, he will tell you this is electrical, we have only five periods a week during the practical and the class but the present other subjects comes in we have physics, chemistry, Technical drawing and so on .Like the C&G I only did physics, English and technical drawing and this were once a week, each of them, other periods for purely technical. You see the difference now, this can only help you when you finish even if you don't do physics, chemistry and you finish as a a technical this thing, you will be able to stand on your own. This are to help you, it's just like class seven, primary seven today.

Interviewer: The next question is could you please explain how you teach the whole curriculum in the electrical installation department. The curriculum guiding your study, how do you teach it?

Interviewee: We teach the curriculum accordingly except otherwise where there are lapses in terms of resumption of students use to affect us to cover the curriculum. Because the curriculum is break down into weekly activities.

Interviewer: How many years do you spent in the electrical installation college?

Interviewee: Three years

Interviewee: You look at the curriculum provision for electrical installation, you spell out what students should undertake in year one, year two and year three, that is finally one that they will graduate. If you are dealing with year one, and then break it into three terms, you will now break each term

depending on which week we have for that term, for instance, on the average in each term we have fourteen to thirteen weeks and by the end of the week you know what to teach the students, that will involve theory and practical. As I said earlier any topic you are going to teach where have aspect of practal now, it is left for you to decide the period in the week, you then if to make a period for theory and two periods for practical depending on the number of terms you have, teachers will break the objectives from term that's what we do and then for weekly basis. There may be public holidays, and events that may not let to accomplish because student's resumption this day then you will not be able to cover the missing weeks.

Interviewee: In addition, this program has to do with insufficient facilities, now in the absence of each facilities it uses to make man harder, the knowledge to be harder between the teachers and the learner. And there's an issue whereby the teacher may teach the lesson, the situation of not coming earlier and repeating the lesson, so the teacher has to be sometimes hard to select the major areas towards exams to cover up.

Interviewee: sometimes we don't have the practical because we don't have the materials to demonstrate we have boards like this where we can carry any form of insulation so that topic you'll definitely bring it into the workshop and lay it on the board for them.

Interviewer: Thank you very much. Finally, we want us to discuss ways of improving the curriculum guiding electrical installation program, how do we improve the curriculum guiding the electrical installation in all areas of skills mentioned technical communication, literacy and problem solving.

Interviewee: Curriculum should be reviewed and

Interviewer: How often? You are suggesting

Interviewee: Five to Six years, it should be reviewed, that will give room for checkmating the shortfalls within the areas of studies.

And, provision of enough aids, teaching materials of technical colleges is very important. If a student graduate here it must be restrained courses before he can start performing in the industry.

Then teachers and staffs also, workshop should be organized for them.

Interviewer: You should have also suggested that, you instructors should go to industries because now you see the control, you don't see florescent fixing again and they are controlling it with remote and those things are not in your curriculum.

Interviewee: So, training and retraining of the staffs also being into the industry, that's the staff's themselves including the students. Then provisions of the materials, then consumable materials even sometimes use to be difficult for us here.

Interviewee: Let me not take you far from what you ask, if we are to suggest what will need to improve the curriculum. One statement quite understood that is the issue of review. Content of the curriculum is ought to have been changed, the curriculum spells out topic by topic, what students should undergo during a particular period. Electrical installation curriculum should go along in explaining what is requiring and those important, so that is why the ministry even the other amenities.

Any advance nation you see, you must understand their teachings is at the end of the curriculum, who implement the curriculum what is needed is not only the material alone, how are you teaching, today if they say you are a teacher people don't take over seventy, why because this ordinary farmer are better, you come here the morning and go back in the evening and go and sleep at the end of the you don't have anything to go after. Sometimes even if you have the materials, there some of the teachers that they don't even look at the material because what you are teaching is more than teaching the student. When you cannot feed your family.

Interviewer: But you are taking your salary

Interviewee: Yes, I'm taking, but that salary I'm taking, in a day or two I can spend that salary.

Interviewer: What grade level are you?

Interviewee: I'm on grade level 10, you know the minimum, and how much is the minimum? 18 thousand is the minimum. Excuse me from you place to this place, the transport how much is your transport from 18,000

Interviewer: I'm not on 18,000

Interviewee: No, I just say supposing you are giving 18,000 from your state and you are to come here and go back.

Interviewer: Somebody on 18,000 will not even come here in the first instance, is either you are a vice-principal or a principal.

Interviewee: The issue of inspection, the board that use to carry out our Inspection is no longer having autonomy and those that are supposed to be effective on supervision are people that don't even know where to start because they are not technically orientated so you see is another slap again on this .

Interviewer: Any other thing to be discuss? Thank you very much, in the absence of no other thing, I want to thank you for your participation your contributions will make a valuable contribution to this research you are all welcome. Thank you very much.

FGD 6 TRANSCRIPTION

Good morning all, you are all welcome to our session. Without wasting much time, let's go to the questions we have. It is a discussion group, focus group discussion, there are no wrong or right answers, just give me your views concerning what you know about the questions.

Interviewer: What's your level of experience?

Interviewee: Over fifteen years.

Interviewee: One of the instructors in engineering department, I've been in the job for the past twenty-one years.

Interviewer: Thank you

Interviewee: I've been in this field for the past twenty oneyears

Interviewer: You are welcome.

Interviewee: A student teacher, teaching practice student

Interviewer: Okay, you're welcome.

Interviewee: An instructor in the department. I have eight years' experience as technical and installation instructor

Interviewer: Thank you.

Let's go straight to the questions to discuss.

Please, what do you understand by the term curriculum? And please explain the purpose of curriculum in your program of study.

No right or wrong answer just tell me your views, the way you see it.

Interviewee: curriculum can be seen as a guide for the teachers. It means guide lines for teachers to engage themselves in teaching, contains the topics teachers used to train the students, then the steps taken if possible, the topic , sub topic, and what and what the objectives to achieve during the teaching is what we called curriculum.

Interviewer: What's the purpose of curriculum?

Interviewee: The purpose of the curriculum is to enable the teacher to be able to achieve the set objectives.

Interviewer: Thank you very much. Can you just give me one set of stated objectives you want to achieve?

Interviewee: Okay, assuming I'm teaching a topic, let's say a Transformer, we know that a transformer is a device in electrical that is used either in stepping up the power or down. Now, by the end of the lesson, students should be able to identify different types of transformer, should be able to State the functions of a transformer, they should be able to know the parts of a transformer. All these are set objectives that I want to achieve at the end of my lesson.

Interviewer: Thank you very much

Interviewee: I found myself teaching in school but what I read is purely engineering.

Interviewer: But even in engineering, we have curriculum to follow

Interviewee: A teacher should be able to simplify it to the understanding of the student; a teacher should bring it from simple to complex that is just my own perspective on curriculum.

Interviewer: Thank you

Interviewee: Curriculum is set to academics directly, how to achieve the set goals of what you want to teach the students for certain years of their courses, like technical colleges now, we have three years and our students will cover year one, year two and year three, a curriculum is spelled out. All the components we need to teach this student, we need to come across what we called cognitive, affective and psychomotor domain which the students to know throughout the three years.

What to teach the students in year one, what to teach in year two and what to teach the students when they are in year three, and it will be put sequentially .When it comes to teaching, you teach from known to unknown, from simple to complex. So, the curriculum will be arranged like that instructions that are needed to be given to students throughout the student years of study in a classroom and it will be arranged according to their level. And it is for that curriculum, which we are going to break it down to scheme of work. For that particular time we will check the curriculum, what is to be

taught for this so so time in a year and we will be taught in a session will be break down to scheme of work and time by time and all this thing has to access cognitive, affective and psychomotor domain

Interviewer: Thank you, student teacher.

Interviewee: Yes sir, they said it all. Boss said it.

Interviewer: And what does your boss said?

Interviewee: From the curriculum we break it into scheme just what my colleague just said, out of that scheme of work that is where we also break it down. And inside the curriculum there are some guidelines that what we teacher will do and what the students will also do. And at the end of the lesson what the student expected to know especially in technical colleges, our students we supposed to be practically orientated because they are practical students.

Everything that all the teachers and the students supposed to do is spelled out in the curriculum.

Interviewer: Thank you

Interviewee: The way I understand curriculum it is a system designed by experts to achieve a specific goal either by a name, a town for example if you want toachieve a goal let's take an example like an electrical workshop I want to teach astudent how to construct or how to take bearing so that at the aid of the bearing you understand how to connect this one so that the house owner will get the result based on the way I understand curriculum.

Interviewer: Thank you.

Question no 2: Discuss how technical, communication, literacy and problem solving skills how they are taught in electrical installation program, how do you teach those place in your field as an electrical expert technical skill, communication skill, literacy and problem solving skills how do you teach them?

Interviewee: when it comes to technical Education our head, hands are the fundamentals I hope you re following me our head, hand as a development, even when it comes to technical Education somebody who those not hear English very well will discover that when you start the practical

demonstration they are thebest people that you will even find when it comes to issue of practical so in our communication the way we when we start our demonstration it is a great thing to communicate with students because let's say you want to construct something now you first of all ask the students to identify the tools, the students will identify that this is the hammer, this is the screw driver, this is a plug, this is side cutter,and at the end of the day, they show it to them and by the time you start to carry out the operation after they have seen it that is ways of communicating with the students with the language English, we speak English to them but one thing I want you to know when it comes to technical Education as they are participating because they are practically inclined, that is why we tell you psychomotor domain, because they will use their hand and brain for developing okay you will show them that this is want we are using this one to do, this one is for this one, and by the time you carry the wire you are demonstrating, as they are seeing itand using their hand to touch them they will understand better, the way our demonstration and communication skill then this one also as we are telling themall that one has to do with cognitive effects their own interests inside is also affecting, so that is why when it comes to technical Education, cognitive, affective and psychomotor domain they are all the real way to communicate with students.

Interviewer: okay you have not touched the problem-solving skills; how do you teach problem solving skills.

Interviewee: in that aspect problem solving skills we will also prepare the teaching aides for them to see, I think possibly the area of calculations that is where the problem-solving skills arises.

Interviewer: if don't understand the problem solving skills in calculations you now say Voltage=current multiplied by resistance andwhat is R is problem solving skills then how do you teach these, if you Introduce a friend into the wiring system how do you solve it and how do you teach those things?

Interviewee: okay we procure teaching aides, we want to teach such kind of subject and we are also going to draw like a simple part of a problem solving

skills is when you are to teach them the mathematical expression of ohms law after you might have treated the ohms law and you are giving them V=IR and

I=V/R and R=V/I all these expressions you will treat it one by one for them with

The circuit diagram and where this one can also occur their applications, practical applications for them to understand.

Interviewer: Thank you.

Interviewee: sometimes we can even use the students one of them you can set him to be your current, you can set the other one to be your voltage and the other one your resistance and explain the relationship between the current, voltage, and resistance and in addition may be in terms of wiring you can use either of the instruments like the multimeter to show them this is how you discover when there is a current in this wire in case may be they connect something with the socket and it is not bringing power, and you explain to them that if you cut the wire and connect it with the N and by their own they are doing the practical, they will also understand that there is a program, that there is no flow of current, and that there is problem in between the wire.

Interviewee: let's say we are teaching them about series circuit, if you connect the series circuit whether you use the battery or the cells in the series or you use the electric cell to power some circuit and at the end of the day you remove one you know it won't work and if it is series connection you make that you put random ports inside you know that some will not glow well well and you will discover that more as the points are, parts of lights are you will discover when you use one switch it will be blinking and the voltage will not be full and by the time we now remove one bulb in all the parts of the whole this thing you will discover that when there is one problem with one part of light it will affect the other.

Interviewer: is it the series circuit or integrated circuit.

Interviewee: the series circuit, by the time you also connect the parrallel you ask them to connect the two together it is something that you see, and it is in English language they can also get it clearly.

Interviewer: Thank you.

Interviewee: You are welcome.

Interviewee: let me just add something, many parts of calculations makes learning more interesting and make it more lively for the students you know to hasten their understanding there are instances whereby when you give a calculations in a class, don't make to be like a teacher cantered of teaching, involve the students, how do you involve the students, you may decide to give or call a student to come to the board to do it in front of the other students it hasten their anticipation during the teacher aspect but when it is concerning the teacher, whether you like it or not, there are some students that aides the teacher, and no matter how you think you are good in teaching in fact you will feel as if you are just wasting his time, you might not care for him to go along with you, but by the time you start engaging students in participating in the class and attend other classes of other teachers and correct any mistakes.

Interviewer: Thank you very much.

Interviewee: we also adopt play way method.

Interviewer: which one is play way method?

Interviewee: You make them relax, take for example now of it is problem solving skills you want to teach or demonstrate, you may decide to sing, those are the things you need to consider like the colour code I know it will be difficult for them to understand the other line, so I will tell them why this one is white, black, blue, yellow and by the time that one registers into their memory as they are singing that song they will be able to answer the questions conveniently it is in form of play way method of teaching in the electrical department.

Interviewer: Thank you very much.

Interviewee: Let me just add one sentence to it

Interviewer: Just one sentence

Interviewer: If you are to explain Ohms law a student may not understand, then you can find a source let's say battery, just find a wire, since you now the current and you have the resistance, connect it then you bring out the either analogue metre or digital meter measure the current so they can see the and know the practical aspect in case they don't understand the current.

Interviewer: In some instances when you have the voltage, assuming the theoretical lay, you have the voltage and you have the resistance without practical sing it, you can easily get the current from your calculations but at the end of the day, if you measure it does it amount to what you get theoretically.

Interviewee: Yeah, the issue is that just get your own measuring instrument, turn it to the right place, just put in the right position it will measure it. It depends, if battery of the measuring instrument but it will be …

Interviewer: Thank you very much

Interviewee: we now that when there's an increase in voltage automatically there will be increase in resistance so to make it practical, let them see it Okay the way I use to do it, I will come with two students, if I call out two students to represent my voltage, I get one to be my current, now get two to be my resistant.

I now ask the two students who are representing voltage to now a kind of push to make current flow, automatically we should expect the current to flow because the current is classically. Now, if now said okay let me increase voltage because those people cannot withstand the five, though there will be opposition, but they cannot stop them. So, I should expect that the movement of that person serving as current should be a bit faster, well I just use the practical for them to remember the theoretical aspect of they will not be able to remember what have told them.

Interviewer: Thank you very much.

The next question, asking you to please describe how you design your Curriculum guiding electrical installation program, how do you design your curriculum?

Are you the one designing the curriculum?

Interviewee: No, just like the other person said there are designer, specialist.

Interviewer: Who are those specialists?

Interviewee: National Board for Technical Education use to design the curriculum for us and then

Interviewer: which people there?

Interviewee: the curriculum planners

Interviewer: we have curriculum planners there in your discipline?

Interviewee: Yes, in electrical

Interviewer: what is their qualification?

Interviewee: They are degree holders

Interviewer: In which area, like rightly said, you read electrical engineering. But who are people that designed the curriculum for electrical installation program?

Interviewee: That is where the problem is, there are some of this people that they employed at the external body, i was lucky in year 2002, I went to do their aptitude test, and I have a lot of interaction with those people, we discover that majority of these people there, they have never gone to the field, they were just young graduate that possibly read electrical engineering, and they employed them because they have God fathers somewhere. And sometimes as well when they want to do something, I think they use to invite some people as well , the specialist from different School to go and do that one , then we have another one like federal ministry like this one we have in your hand that design curriculum , can you see that one now, those people that design I think federal ministry of education, we still have harmonized curriculum by our science and technical school management where they call our teachers from the six technical schools we have in other State. And call at least a representative from each section.

Interviewer: Do you have six technical colleges in your State?

Interviewee: We have either six or seven, seven.

Interviewer: I could only locate four on the net.

Interviewee: We have three

Interviewer: I learnt it's in Kafancha

Interviewee: No, that's federal.

Interviewer: Those ones are not there; they are not on the net.

They are newly created.

Interviewee: Yes

Interviewer: Continue

Interviewee: So, they call harmonized curriculum, because at the end of the term we use to do harmonized exam, unified internal exam. So, we and technical school also will prepare curriculum, federal ministry of education prepare curriculum, then other accredited body also prepare their own curriculum.

Interviewer: So, have the experts designing the curriculum for you.

Were you involve in the curriculum planning?

Interviewer: You are not involved, who out of you, among you.

Interviewee: They pick teachers from other schools

Interviewer: They pick from any technical collge, if they should pick from any school its better. You have been involved directly or indirectly

Interviewee: Initially If we look at the manpower and the experience also, this are also aspect because of the field, there are some of them also there and that department is suffering we only have few teachers there's we have challenge.

And that's why I'm this very place few students secure admission.

Interviewee: Still on addition, he made mention of unified exam and made mention of harmonized curriculum that the body do call teachers for, the reason is because, you see, we have external bodies and technical management. You find out three bodies so that teachers will not be using a different curriculum but when we go there, seat down, look at the topics, then we bring them together so that every school will be teaching the same thing. Are you getting what I'm saying, that is the why we have harmonized scheme so that all technical colleges in?

all State will be teaching the same thing. Let's say week 1, first term, transformer, all the schools will be teaching transformer. So that during the

Unified examination, at least, if even if are not the one that set the question, your student should be able to attempt.

Interviewer: But which exam do you normally do for unified exam?

Interviewee: National technical examinations.

Interviewee: we still have trade test 2&3, one cannot be given at the technical level.

Interviewer: So, you are using two different curriculums now, one for NABTEB, one for NBTE or WAEC.

That WAEC is NECO?

Interviewee: NECO is different from WAEC.

Interviewer: Okay, West African Examination Council

Interviewer: If you are talking of technical college, you either run a NABTEB or

NBTE. Now you are not doing City and Guide of London again

Interviewee: For city and guide we have that one in the 1960s

Interviewer: We still have it in 80's, I graduated 80's and I did City and Guilds.

Interviewee: Okay, thank you very much.

Interviewer: Now the next question, how does the current curriculum that you are using guiding electrical installation program, how does it satisfy the skills demand by construction companies.

Interviewee: If you look at the aspect of their performance, that's why we have this Industrial attachment, most especially when our students go out for this

Industrial attachment, the companies don't give room for us to give more. So, this are aspects about the performance.

Interviewee : When we talk of this Industrial attachment, we don't just allow the students to go there , we do what we call the follow up visitation so as to see their performance and we try to interact with the company based supervisors to really know whether our students performance are up to date. When we attach them to this people, they get things easily.

Interviewer: Does your curriculum satisfies the skills demand by construction companies?

Interviewee :We don't really understand your question but to me, part of these curriculum are becoming obsolete, not satisfying the construction companies nowadays, they are things to be done based on this changing technology, the curriculum people should also do something as the society is changing, we must also follow change. Yes !, take for example now , one of the technical Colleges where they study radio and television were used to monochrome television, this radio that is having chassis and many other thing , and when we started even electrical installation, but when you look at the current technology now, when you are to put this white meter there , you discover that today we are using prepaid meter, we no longer into this lamp holder lamps any longer, we are going to the panel something, so the curriculum is somehow obsolete now and we prayed that technology is advancing, those people that will still review the curriculum.

Interviewer: When last did you review your curriculum.

Interviewee: I think three years back

Interviewer: But the last I got was 2007, if I should ask you to bring the one you are using now, I think it has not been revised in the last ten years

Interviewee: So, this are the challenges that we are facing.

Interviewer: Did you agree with me?

Interviewee: I want to agree with you, let me agree with you because we are in the same field, the questions is for us to buttress what is happening. So, the curriculum is becoming obsolete, if not because of the experiences of the teachers now. If you are going by what we have here in fact we will not be able to connect with the challenges we are having now, if we are not developing ourselves and we are to follow this one okay, if you are in electronics and you are talking the old television , and now all this table less television now has become plasma and curriculum does not spell out a plasma for you, in fact even if it is GSM , the first generation GSM this global handset we have now we have having soft touch and we have the one with antenna before and we can even browse the internet, before it wasn't like that, so you discover that part of the curriculum is becoming obsolete but by the grace of God we are trying and we are also developing ourselves we now

inform the students we have panel light , how to install prepaid meter, how to use some of this CCTV in the house and all other things that are not available even in the curriculum. Part of the curriculum is becoming obsolete to be candid and not satisficing the industrial presently.

Interviewer: Thank you very much

Interviewee: To develop is a big challenge, we are coming to that where we will be using remote control to on the light.

Interviewer: It's ready in Nigeria. If you go to five-star hotels, if you go to airport you see it and control it.

Interviewer: You mean your curriculum is not effective

Interviewer: Going with this question, I think the curriculum, it is analogue, and we are already in a digital world

Interviewer: Thank you very much

Please can you let me know how you teach the whole curriculum guiding your study, designed for electrical installation program?

Interviewee: It is broken into scheme of work, when we are working with curriculum. We see where we need to start, the Head of Department break the curriculum into scheme of work for us for nine terms for that three years.

Interviewer: Nine terms for that three years? Okay three terms per year

Interviewee: Yes.

Interviewer: A term comprise of how many weeks?

Interviewee: Sometimes twelve to thirteen.

And even when we look at this curriculum now, sometimes the curriculum planners or designer will already plan okay, this is for year one, this is for year two, and the one for year three, the HOD should instruct for so so and so topic to so-so topic, you are to reach this one week 1, 2,3,4,5,6,7,8,9,10,11 and when we get to week 12, we know it's a revision and then will 13 week will be for exam. Do you understand, we study those topics that are available for that particular session then, the HOD will lead us on how to break it down into scheme of work for that three years and for that one year, for that session? The one they have four SS1 now we'll break it for a term and when we come another term. That is how we use to teach the whole Curriculum.

Interviewer: Thank you do you have any other contribution?

Interviewee: My contribution is that, the way to teach this curriculum we have to start from the simple to complex for example if I want to teach periodic table, then I will start from atom, if the students understand the atom, then I would go to element then I go to compound then I go to mixture, because I cannot start from the mixture, I have to start from the simple one to complex one.

Interviewer: Thank you

Interviewee : And addition to that, as colleagues either we like it or not, when it comes to teaching there's possibility of maybe someone encountering a topic that a bit difficult for him, there's tendency for an instructor to look at that topic to be a simple topic for him. Either the first instructor who is having difficulty with a particular topic to go and meet another instructor who puts him through or if possible the first instructor can go in and teach the students there's nothing wrong in that, that is what we call team teaching. You don't feel that you know everything, that's another thing that you don't do, you don't jump topics because the topic is difficult for you so I jump it and forget about it this students will miss a lot.

Interviewer: To the best of my knowledge, some of the instructors jump topics

Interviewee : We know, taking over is obtainable here, you can testify here even during our meetings, sectional Meeting or departmental , we use to hammer in this, if you have any difficulty with any topic please don't jump that topic invite somebody that you think is better than you just discuss it with colleague , nobody is an island. There's nothing wrong in students seeing another teacher from that same field going to teach.

Interviewer: Thank you, and lastly.

Let's discuss ways of improving the curriculum guiding electrical installation program in all areas of skills nature, how do will improve the curriculum of electrical installation.

Interviewer: Number one, the teacher as custodian of knowledge has to develop his/herself in order to know the contemporary need of the students.

Self-development is number one as we have said the curriculum part of it are obsolete. That's need for us to develop ourselves via research and thank God for the internet now that we can easily see those things that we call come across, there was a time was a time it was this colour code for and the end of the day they brought out colour cooking for capacitors. I have to force myself and go to internet because I have not even seen textbooks that have colour code on capacitors. It is colour code on resistant that we have but they say capacitors are now carrying colour codes. And that is challenge that we have and for us to meet up, there must be self-development

Interviewer: And you are using capacitors in motors, electric fans so it is faulty now, you don't know the tolerance, it will be very difficult for you to know the right type and you have to improve your curriculum before you can do that.

Interviewee: You must improve, we can say because this and that look at many of our equipment's now use remote control, we have only idea of monochrome television, black and white. Now where do you see white and black television? We must also put interest, interest is another factor, and moving to school also, furthering our Education will also help us, I'm sorry sir. We are graduates of the 1980s

Interviewer: Analog graduate

Interviewee: People like us are analogue graduates. Some of the methodology we have, because some of the challenges of what we are discussing they proffer solution to the problem and they are coming out fresh. They have been adjusted, they have panebited then to the main system so, and that is why we must transfer this knowledge to ourselves who will improve on this our curriculum now.

Based on what we have passes if one teacher does not understand what they should come. So, self-development interest, furthering our education will also help us and when we interact together, teamwork will help us.

Interviewee: When planning the curriculum teachers should also be considered and they should plan it in such a way that will favour the school outside.

Interviewee: In addition to that one, we must consider the students that will use the curriculum, for example we have to consider the environment and the students that will benefit the curriculum. I can't design something that somebody cannot use it.

Interviewer: Thank you very much

Interviewee: I think I still add too, the curriculum developers or planners should not just seat in the office and began to design whatever it pleases them, if they cannot invite the teachers, they should sample some schools, go round the school, sample ideas from teachers, I think it will help them if they do it that way with or without teachers during the planning and developing. Apart from schools they should go to industries too. Because we train this student to be able to go to the industries. If possible, invite the industrialist what is obtainable now so as to guide them in planning the curriculum so if they should do that it will definitely meet alot of challenges that are facing the students. Retraining we be a kind of refreshing thier knowledge.

Interviewer: Thank you very much, any other contribution?

Interviewee : We want to thank you for coming, it serves as brainstorming and we enjoyed it, and this interaction is also a help to us we believe one day, we will also get to where you are and that is how we will also develop , this one is academics listening?

Interviewer: So, I wish to thank you for your participation, this will make a valuable contribution to the research, once more thank you for taking your time. Thank you all.