

## **CHAPTER ONE**

### **INTRODUCTION**

#### **Background to the Study**

The state of the economy and socio-economic well-being of any society is linked to the effectiveness of its education and the competencies of the work force. The effectiveness of any nation's labour force and skill development programme can be achieved when it is geared towards functional system of education such as technical, vocational education and training (TVET). This is because according to Samuel (2011), technical, vocational education and training as an academic programme has acknowledged accepted as an investment in human resource development and as a critical factor in any socio-economic development.

The Federal Republic of Nigeria FRN (2013) expressed special concern for functional education; that is education that is practically oriented and relevant to the needs of the society as well as for self reliance. This informs us that for education to be relevant to the people it must be designed for development of skills which are responsive and relevant to the country's human resources required for production and desired to eradicate poverty (Samuel, 2011). This is in line with what Hunsaker (2001) stated that employees must have been equipped adequately with the relevant technical and other complementary (generic) skills and competencies needed in their vocation. This implies that high level of competency is imperative in the success or practice of any trade or vocation.

Competency, according to Alio and Uzor (2010), is a combination of knowledge, skills, attitude and values displayed in the context of task performance. Alio and Uzor stated that competency is a combination of knowledge, skills and attitudes that

can be developed through training which are adequate for accomplishing some specific tasks. Therefore, the competencies of electrical trade artisans in the context of this study is the ability of this set of workers to possess required theoretical knowledge, practical skills, entrepreneurship skills, managerial skills and work attitude, skills, available in Technical, Vocational Education and Training (TVET).

In another perspective, competency is the ability to do something well, in relation to some standard. It is the specific ability one has to perform or carry out tasks with efficiency and effectiveness. Specific abilities are acquired through experience and training. Competency can equally be defined as the ability or capacity to carry out any action and skills characterized with complexities and difficulties (Ogbuanya, Abdullahi & Ado, 2013). Also, Olaitan (2003) stated that competency implies that the said individual has the required knowledge, skills and attitudes in order to perform successfully at work. Grove (2003) opined that competency is a quality or state of being functionally adequate or having knowledge, skills or strength to carry out a particular duty or task.

Therefore competency is a set of defined behaviours that provide a structured guide enabling the identification, evaluation and development of the behaviours in an individual employee. It is a combination of knowledge, skills and behaviour used to improve performance, or the state or quality of being adequate or well qualified, having the ability to perform a specific task. In line with these assertions, Samuel (2011), stated that artisans (electrical trade artisans inclusive) will be effective only if they possess skills and competencies to achieve some of the TVET objectives of wealth creation. This requires adequate training, using the right materials and appropriate method by the

artisans.

Effective performance in any given vocation, trade or occupation requires acquisition or possession of required competencies, knowledge and attitude. Therefore, individuals seeking to enter into an occupation, like electrical trade, should possess the necessary and needed competencies, knowledge and attitude to be able to achieve maximally in production of goods and services available in such occupation such as electrical installation.

Electrical installations (domestic and industrial installations) is one of the specialized areas in electrical trade. This trade is one of the trade areas offered in technical colleges in Nigeria. Electrical installation comprises basic electricity, battery charging, domestic installation, industrial installation, cable jointing and winding of electrical machines (Ogbuanya, Abdullahi & Ado, 2013). Domestic installation is concerned with installation of electrical components or equipment in a building and such other equipment or components which include home appliances fixed in positions for use. On the other hand, industrial installation is according to National Board for Technical Education (NBTE, 2008) one that provide the trainees with the knowledge and skills which will enable them carry out all types of industrial/factory installations.

Electrical trade artisans acquire skills in domestic and industrial electrical installations through apprenticeship training. Report by Osuala (2001) showed that products of technical colleges are incompetent and cannot be self-reliant on graduation. Osuala further, stated that the unskilled Nigerians are jobless not because of the absence of job opportunities in the industries and electrical firms but because they lack adequate electrical installation competencies to take up the available skilled jobs. This points to

the need to determine the competencies required by the electrical trade artisans. The electrical trade artisans work under supervisors who oversees their activities by making sure that their works are done correctly and safely. The supervisors serve as trade foremen who are in the position to determine the competencies required by the electrical trade artisans under their supervision (Okozor, 2006). It is necessary to determine the competencies required by the electrical trade artisans in order for them to be competent and also to attain high economic status in the society.

Attaining a level of competency in a trade is very imperative and can be achieved through appropriate training if one has to remain relevant in the vocation and also to progress in it. Obayi, Obi and Okafor (2012) observed that workers are not born with capabilities but their potentials can be developed/stimulated by appropriate training methods, and competency achieved through long years of experience in the vocation. Obayi, et al further stated that such training is meant to help workers/employees acquire and apply knowledge, skills, abilities and attitudes needed by an organization in order to achieve its goals and objectives. The need for training and retraining of workers, electrical trade artisans inclusive, is to enable them acquire relevant skills and knowledge which will enhance their performance on the job.

Obayi, Obi and Okafor (2012) were of the opinion that development training enhances and upgrades the management know-how, skills and techniques of existing entrepreneurs. The much emphasis placed on retraining artisans points to the need to determine the competencies they require through apprenticeship training. Retraining of workers was necessitated as a result of shortfalls in employees performance which could be solved by appropriate training (Obayi, 2009). It was in recognition of this fact that

the Federal Government of Nigeria in 1987 instituted the National Directorate of Employment (NDE) to address the issue of skill acquisition among youths and graduates of tertiary institutions. NDE programme which is a formal apprenticeship scheme, was established to avert and correct the shortcomings of traditional apprenticeship. Doko and Uthman in Okozor (2006), commenting on the features of traditional apprenticeship system, stated that the training given to apprentice is often narrow and mainly focused on practicals and lacked theoretical contents. Consequently, their creativity and ability to innovate are not developed and therefore the recipients are unable to deal with situations which may not be exactly like the ones they had experienced before. Elobuike (2006) asserted that apprenticeship system vis-a-vis artisan training should incorporate theoretical knowledge, practical skills and work attitudes in a quantitative and qualitative manner in chosen occupations to enable the artisans perform effectively in worthy socio-economic life and in different work conditions.

Artisans in this context are skilled manual workers who produce items and render services that may be functional in a limited quantity. Webster (2013) stated that an artisan is a worker who practices a trade or handicraft, or one that is producing something in limited quantities often using traditional method. Electrical trade artisans constitute of good number of workers in the informal sector of the economy and are found in strategic locations in urban and semi urban centres in Enugu State, where there are availability of amenities, such as electricity supply.

Electrical trade artisans also are tradesmen whose specialized areas include Electrical installations (domestic and industrial installations), house wiring, maintenance of electrical appliances and so on. These group of tradesmen also may be employed for

the installation of new electrical components or the maintenance and repair of existing electrical infrastructure.

There are indications that many shortfalls are experienced by customers in the products and services of these artisans. The tradesmen also cannot initiate new ideas or create innovations in their field of occupation because of the limitations in their initial training which was based on traditional apprenticeship system. Ezeji further asserted that they (artisans) also have poor customer relationship due to the narrowness of their training.

The deduction one makes is that unskilled or semi skilled employees, constitute a cog in the wheel of progress in technical education and their output is generally low while the rate of wastage of time and materials may be high. They lack interest in their jobs and their poor attitude to work might be consequent upon their poor competency acquisition. In order to avert these shortcomings, the electrical trade artisans need to possess modern practical skills and scientific knowledge, right attitude to work and entrepreneurial competencies through in-service training. This will make them function effectively in this present age of high technological growth and development.

Therefore, the ability of the artisans to perform depends on skills and competencies acquired through appropriate training and years of experience in the vocation. In the context of this work, experienced artisans are those who have been in the vocation for five years and above while inexperienced artisans are those who have worked in the vocation below five years. Even with experience and some level of competence, it appears that the majority of the electrical trade artisans in the state lack some relevant skills and knowledge to render effective services to the society. Their

ineffectiveness could be linked to their poor communication skills, practical/technical skills and theoretical knowledge. Artisans need competence in theoretical and scientific knowledge to be able to read and interpret complex circuits and drawings that usually accompany the current technological equipment.

Acquisition of practical skills which have to do with working on machines, applying safety precautions and providing maintenance services of equipment in the workshops are inevitable requirements of any artisan for successful development in the vocation. Artisans also need to have good work attitude to enable them have positive relationship with their customers and co-workers, manage well with some level of entrepreneurial competencies that may be acquired through in-service training. These aforementioned competencies could be acquired through appropriate training and re-training programmes provided in NDE formal apprenticeship scheme available in all the states of the federation. The need for continued training of electrical trade artisans cannot be over emphasized, because of the increasing complexity of their jobs as a result of current high technological development.

On the other hand, Olaitan (2006) stated that most of the artisans are from low income group and therefore are unable to go for in-service training. As a result, many of them seem to have lost interest in their jobs while others were frustrated out of the occupation. Most of them have left their jobs to easier means of earning a living by becoming Motorcycle (Okada) riders and Tricyclist (Keke Napep) operators thereby exposing themselves to danger of road accidents. The sudden change to apparently easier means of livelihood by most of the artisan workers is a pointer to the need for determining the competencies required by the artisan workers for domestic and

industrial electrical installations to help retain them in their vocation and for effective performance in the formal sector of Enugu State.

### **Statement of the Problem**

The deficiencies in the unorganized training of artisans, have made their operation in the informal sector of economy to be relatively haphazard. Thus, the maintenance and repair work by these category of workers has been through trial and error. Alio (2006) stated that rapid technological advancement has introduced challenges in technology education in recent times. These challenges are seen in the invention and production of new equipment needed to explore man's environment. In the face of these challenges in innovation and inventions in the technological developments, certain skills have become obsolete. For instance, almost every month, new equipment and accessories in electricity/electronics are introduced in the market. These new accessories require some specialised competencies for their operation and maintenance while some use auto-electricity to function, and some use autotronics to operate.

Nigeria needs the labour force that possesses needed competencies and who can function efficiently in the society as the economy keeps on changing. The problem has been that technical labour force available particularly electrical trade artisans, lack or have failed in their duties to produce high relevant and standard products and services that can compete favourably with the foreign ones. For instance, Ezeji (2006) stated that these group of tradesmen are not reliable in keeping time schedule, have poor value system and most electrical trade artisans have untidy finished work. Most of the electric fire outbreak was as a result of in competency among trade artisans. This appears to

imply that most of them are not skilled in their trades and one should not be surprised that their roadside shops are flooded with unrepaired electrical appliances. Therefore, it is in recognition of these ailing problems that the researcher set out to determine the competencies required by trade artisans for domestic and industrial electrical installations in Enugu State to make the artisans functional and progressive in this present age of high technological development.

### **Purpose of the Study**

The purpose of this study is to determine the competencies required by trade artisans for domestic and industrial electrical installations in Enugu State. Specifically, the study sought to determine the:

1. Theoretical knowledge competencies required by trade artisans for domestic and industrial electrical installations in Enugu State,
2. Technical competencies required by trade artisans for domestic and industrial electrical installations in Enugu State.
3. Entrepreneurial competencies required by trade artisans for domestic and industrial electrical installations in Enugu State.
4. Managerial competencies required by trade artisans for domestic and industrial electrical installations in Enugu State.
5. Work attitude competencies required by trade artisans for domestic and industrial electrical installations in Enugu State.

### **Significance of the Study**

The findings of this study will be of immense benefit to apprenticeship Master craftsmen who train the artisans, vocational/technical education instructors, artisans

themselves, industries, research students and the general public. The apprenticeship masters craftsmen as the major trainers of electrical trade artisans in domestic and industrial installation could apply the findings of this study to improve their system of training by expanding the theoretical and practical contents and other areas advocated in this study on their training programmes. The apprentices will become competent on graduation and the master craftsmen can even employ them to increase their productivity.

The Vocational/Technical education instructors in electrical trade could also benefit from the findings of this study which will improve their training pedagogy to make the artisans competent in their vocation. Adequate knowledge of determined competencies in this study will stimulate and motivate the technical instructors to explore other innovate ways of imparting theoretical knowledge and technical competencies. Further, the determined competencies will then be effectively applied by the technical instructors in the training of competent craftsmen and technicians.

Similarly, the electrical trade artisans themselves will benefit from the findings of this study in the sense that it will give them the opportunity to discover areas where they need retraining to enhance their productive ability in their vocation. Increase in the artisans productive power will enhance their socio-economic status in the society. Furthermore, employers in electrical industries will benefit from the result of this study, because if the findings are implemented, it will go a long way to alleviate their problem of retraining artisans after employment and hence reduce costs. Artisans' productivity will be enhanced when they are competent in their work. As a result of having efficient workforce in the industries, possible labour change would be minimized because

artisans would no longer be frustrated out due to poor competencies, rather they will progress on their jobs.

Students, researchers and research institutions will also benefit from the result of this study. They will have the opportunity to discover areas to improve upon in their vocation. Researchers will be exposed to competencies in the domestic and industrial electrical installation studied in this work. Hence, they will obtain adequate information on the subject matter studied which will be used for further researchers.

In the same vein, the society will also benefit from the findings of the study because if artisans should acquire functional competencies through in-service training, it will help them engage in productive work in the industries. This in turn will enhance their socio-economic life, ensure technological development and curb or reduce the adult unemployment. As a result, crimes associated with youth and adult unemployment would reduce and by extension, the general public will enjoy a crime free society.

### **Scope of the Study**

The study was delimited to determining the competencies required by trade artisans for domestic and industrial electrical installations in Enugu State. The content was delimited to theoretical knowledge, technical, entrepreneurial, managerial and work attitude competencies while respondent variables are delimited to status and experience. This study was equally delimited to trade artisans and supervisors in an organized setting.

### **Research Questions**

The following research questions guided the study:

1. What are the theoretical knowledge competencies required by trade artisans for

domestic and industrial electrical installations in Enugu State.

2. What are the technical competencies required by trade artisans for domestic and industrial electrical installations in Enugu State.
3. What are the entrepreneurial competencies required by trade artisans for domestic and industrial electrical installations in Enugu State.
4. What are the managerial competencies required by trade artisans for domestic and industrial electrical installations in Enugu State.
5. What are the work attitude competencies required by trade artisans for domestic and industrial electrical installations in Enugu State.

### **Hypotheses**

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant difference in the mean ratings of trade artisans and their supervisors on the theoretical knowledge competencies required by trade artisans for domestic and industrial electrical installations.
2. There is no significant difference in the mean ratings of experienced and inexperienced trade artisans on the theoretical knowledge competencies they require for domestic and industrial electrical installations in Enugu State.
3. A significant difference does not exist in the mean ratings of trade artisans and their supervisors on the technical competencies required by trade artisans for domestic and industrial electrical installations.
4. There is no significant difference in the mean ratings of experienced and inexperienced trade artisans on the technical competencies they require for domestic and industrial electrical installations in Enugu State.

5. There is no significant difference in the mean ratings of trade artisans and their supervisors on the entrepreneurial competencies required by trade artisans for domestic and industrial electrical installations.
6. There is no significant difference in the mean ratings of experienced and inexperienced trade artisans on the entrepreneurial competencies they require for domestic and industrial electrical installations in Enugu State.
7. There is no significant difference in the mean ratings of trade artisans and their supervisors on the managerial competencies required by trade artisans for domestic and industrial electrical installations.
8. There is no significant difference in the mean ratings of experienced and inexperienced trade artisans on the managerial competencies they require for domestic and industrial electrical installations in Enugu State.
9. There is no significant difference in the mean ratings of trade artisans and their supervisors on the work attitude competencies required by trade artisans for domestic and industrial electrical installations.
10. There is no significant difference in the mean ratings of experienced and inexperienced trade artisans on the work attitude competencies they require for domestic and industrial electrical installations in Enugu State.

## **CHAPTER TWO**

### **REVIEW OF RELATED LITERATURE**

In this chapter, the literature related to the study on the competencies required by trade artisans were reviewed under the following sub-headings:

#### **Conceptual Framework**

Competency

Trade Artisans

Domestic and Industrial Electrical Installations

#### **Theoretical Framework**

Training Theory of Charles A. Prosser

Motivation Theory of Abraham Maslow

Piaget Theory of Intellectual Development

#### **Theoretical Studies**

Theoretical Knowledge Competencies required by the Trade Artisans

Technical Competencies required by the Trade Artisans

Entrepreneurial Competencies required by the Trade Artisans

Managerial Competencies required by the Trade Artisans and

Work Attitude Competencies required by the Trade Artisans.

#### **Empirical Studies**

Theoretical Knowledge Competencies required by the Trade Artisans

Technical Competencies required by the Trade Artisans

Entrepreneurial Competencies required by the Trade Artisans

Managerial Competencies required by the Trade Artisans

## Work Attitude Competencies required by the Trade Artisans

### **Summary of Review of Related Literature**

#### **Conceptual Framework**

Key concepts in the title of the study are reviewed in this section as follows:

#### **Competency**

According to Webster (2013), competency is a set of defined behaviours that provide a structured guide enabling the identification, evaluation and development of the behaviours in individual employees. Competency, according to Alio and Uzo (2010), is a combination of knowledge, skills, attitude and values displayed in the context of task performance. They further stated that competency, could be developed through training which are adequate for accomplishing some specific tasks. Olaitan (2003) also, stated that competency implies that the individual has the required knowledge, skills, and attitudes in order to perform successfully at work. In the context of this study, competencies of electrical trade artisans implies that they should have required knowledge, skills and attitude to carry out domestic and industrial electrical installations successfully. Therefore, competencies are those attributes that people need to be successful in their jobs. These are all the related knowledge, skills, abilities and attributes that are required for a person's job. In this context, specific qualities are correlated with superior job performance and can be used as a standard against which to measure job performance as well as to develop, recruit, and hire employees.

Competencies and competency models may be applicable to all employees in an organization. Identifying employee competencies can contribute to leverage

within improved organizational performance. They are most effective if they meet several critical standards, including linkage to and leverage with an organization's human resource system.

The competencies needed by trade artisans to excel in their vocation should be determined to ensure success in their jobs to improve performance and provide enhanced productivity. In the context of this work, competency is the ability of the electrical trade artisans to possess requisite skills to carry out domestic and industrial electrical installation works efficiently and effectively.

### **Trade Artisans**

Electrical trade is an occupational field that deals with electrical works. According to Ogbuanya, Abdullahi and Ado (2013) this occupational area includes house wiring, maintenance and repair of electrical appliances such as refrigerators and air-conditioners. This trade also includes installation of new electricity components or the maintenance and repair of existing electrical infrastructure.

In the past, workers in the electrical trade were trained through apprenticeship and are referred to as electrical trade artisans or electricians. This category of workers are found in some other disciplines, for instance, electrical tradesmen are found in mechanical field and such workers in the field are called Auto-electricians and they dealt with all the electrical works in auto-mechanics and other related jobs (Webster, 2013).

Electrical installation trade artisans are low class workers that carry out electrical installations and maintenance works. This category of workers are trained through apprenticeship and their ability and proficiency in the profession on graduation depends largely on the efficiency and competency of the master trainer.

The whole programme (apprenticeship) in which these artisans are trained are organized and altogether in an informal nature. As a result, the contents of the training programmes are inconsistent and narrow in scope (Doko & Uthman in Okozor, 2006). According to Osuala (2008), the workshop managers cannot provide all the knowledge and skills needed for the students or apprentices to live up to expectation on graduation. This may be as a result of ill-equipped workshops, poor supervision and organization of workers, unqualified staff or trainers, inadequate funding and un-cooperative attitudes of many industrial workers. Furthermore, some workshop instructors appear to be unwilling in providing essential theoretical knowledge, practical skills, work attitudes and entrepreneurship skills for people preparing for self employment (Osuala 2009).

The problem the electrical tradesmen encounter was that they were not exposed to wide range of experiences in the profession. For instance, Ezeji (2006) noted that, the apprentices are taught directly on how to solve problem without knowing the source of the problem. This has narrowed their wealth of experience, leaving them incompetent on graduation from the training. Ezeji further stated that competencies of those in electrical trade could be determined to know the extent to which such trade artisans can be productive, innovative and enterprising which involves generating ideas and taking action as well as developing techniques and products that satisfy human needs. Determining the artisans' competencies is necessary because, technological advancement has made some skills to become outdated as new electrical/electronics products that are flooded in the markets require news ideas.

Thus, there is need to determine their needed competencies for the new products. Alio (2006) emphasized the need to update the knowledge and competencies of artisans in order for them to cope with current development in electrical /electronics industry. Hence, the necessity of the current study to determine the competencies required by artisans in electrical trade, especially in domestic and industrial installation, has become crucial especially now that sophisticated equipment are produced using complex and intricate circuits. This means that the workshop managers/industrial supervisors must have the basic language ability, reading ability in order to interpret circuits and manuals. Thus, necessary skills and competencies required in the vocation are required to remain useful and productive in the society.

In the hierarchy of engineering/technical cadre of workers, artisans stand in the lowest level of the cadres. Webster (2013) stated that artisans are the dominant producers of consumers products. During the middle ages, the term (artisan) was applied to those who made things or provided services. Artisans are divided into two distinct groups: those who operated their own business, and those who do not. Those who owned their businesses are called masters, while the latter were the journey men and apprentices (Webster, 2013). Therefore electrical trade artisans in the context of the study connotes those artisans that carry out domestic and industrial electrical installations.

### **Domestic and Industrial Electrical Installations**

Electrical installations whether domestic or industrial installations are specialized areas of electrical trade. This course is one of the courses offered in technical colleges in Nigeria under electrical installation and maintenance works

(Osuala, 2006). The skills in electrical trade could also be acquired through apprenticeship training as well as through formal training in technical colleges. Courses in electrical trade comprises the following; Basic electricity, battery charging, domestic installation, industrial installation, Cable joining and winding of electrical machines (Ogbuanya, Abdullalli and Ado, 2013).

Domestic installations are concerned with installation of electrical components or equipment in a building and such equipment or components include home appliances fixed in position for use. It also involves surface wiring, conduct wiring as well as maintenance of electrical fittings in the homes. The magnitude of the voltage involved in domestic installation ranges from 0.5v – 415v (Thomson, 1973). According to NBTE (2008), the goal of industrial installation is to provide the trainees with the knowledge and skills to enable them accomplish all types of Factory/Industrial installations. Industrial installation involves voltage ranging from 415V and above and is for industrial consumption using high tension conductors (Ogbuanya, et al).

### **Theoretical Framework**

The theories related to this study are grouped under the theories of vocational education and development. Theories of vocational education and developments are attempts made by occupational theorists to explain the intricate network of factors which could lead a person to make the first choice of an occupation. Hence, the theories in which this study is anchored include:

1. Training theory of Charles Prosser;
2. Motivational theory of Abraham Maslow; and
3. Piaget Theory of Intellectual Development

### **Training Theory of Charles A. Prosser**

Prosser (1949) propounded 16 theorems or principles in which training and development of vocational technical education should be based. Prosser propounded that training in vocational technical education should be based on the

following principles;

1. Vocational education will be efficient in proportion as the environment in which the learner is trained is a replica of the environment in which the individual must subsequently work;
2. Effective vocational training can only be given where the training jobs are carried out in the same way, with the same operations, the same tools and the same machines as in the occupation itself;
3. Vocational education will be effective in proportion as it trains the individual directly and specifically in thinking habits and the manipulative habits required in the occupation itself;
4. Vocational education will be effective in proportion as it enables such individuals to capitalise interests, aptitudes and intrinsic intelligence to the highest possible degree;
5. Effective vocational education for profession calling, trade, occupation or job can only be given to the selected group of individuals who need it, want it and are able to profit by it;
6. Vocational training will be effective in proportion as the specific training experiences for forming right habits of doing are those of the finished skills necessary for gainful employment;
7. Vocational education will be effective in proportion as the instructor has had successful experience in the application of skills and knowledge to the operations and processes the instructor undertakes to teach;
8. For every occupation there is a minimum of productive ability, which an individual must possess in order to secure or retain employment in that

occupation. If vocational education is not carried out to that point with that individual, it is neither personally nor socially effective;

9. Vocational education must recognize conditions as they are and must train individuals to meet the demand of the market even though it may be true that more efficient ways of conducting the occupation, may be known and that better working conditions are highly desirable;
10. The effective establishment of process habits in any learner will be secured in proportion as the training is given on actual jobs and not on exercise or pseudo jobs;
11. The only reliable source of contents for specific training in an occupation is the experience of masters of the occupation;
12. For every occupation, there is a body of content which is peculiar to the occupation and which practically has no functioning value in any other occupation;
13. Vocational education will render efficient social service in proportion as it meets the specific training needs of any group at the time they need it and in such a way that they can most effectively profit by the instruction.
14. Vocational education will be socially efficient in proportion as in its methods of instruction and its personal relations with learner it takes into consideration the particular characteristics of any particular group which it serves;
15. The administration of vocational education will be efficient in proportion as it is elastic and fluid rather than rigid and standardized; and
16. While every reasonable effort should be made to reduce per capita cost,

there is a minimum below which effective vocational education cannot be given, and if the course does not permit of this minimum of per capita costs, vocational education shall not be attempted.

Stated above are the 16 theorems or principles of vocational technical education propounded by Charles A. Prosser, in each of them has serious implications in the training of artisan workers to the degree of becoming competent in the vocation. The artisan workers in various trades are mostly trained through apprenticeship system of training and the method of instruction was through imitation and observation with meager and obsolete tools and machines. Workers (artisans) trained in this way may not function effectively in the present time where sophisticated machines and tools have been produced to replace obsolete ones. Hence, for the electrical trade artisans to fit adequately, into the present work situation, there is the need to ascertain the technical competencies required by the trade artisans to be acquainted with new machines, tools, equipment and other products in the market.

For instance, Prosser advocated that vocational education will be efficient in proportion as the environment in which the learners are trained will be a replica of the environment which they will subsequently work. This has serious implication in the training of artisans because most of them are trained by roadside master trainer and training received through that way may not enable them to be conversant with industrial rules and regulation and as such may not function effectively in their place of work if eventually employed.

In another development, Prosser also propounded a theory which states that effective operational training can only be given where the training jobs are carried

out in the same way, with the same operations, the same tools and the same machines as in the occupation itself. This theory has great emphasis and implication in the training which artisans received, because most of them are trained through apprenticeship system. To that end, their training was not organized; teaching and learning were through imitation and observation with meager tools and obsolete machines. As a result of this inadequacy in their initial training, they are not likely to perform effectively with the advent and introduction of new tools and sophisticated machines that are used to carry out most of the industrial operations with manual guidance. To this effect, it becomes necessary to determine the competencies required by the artisans in the use of current tools and machines in industries especially in electrical trade, to be precise.

Also, artisans' initial training do not give them the opportunity to develop themselves intellectually, because they learn through observation and imitation. This is against one of the theories proposed by Prosser which states that vocational education will be effective in proportion as it enables such individual to capitalise interests, aptitudes and intrinsic intelligence to the highest possible degree. Therefore, electrical trade artisans require both scientific knowledge and practical skills to the highest possible degree to enable them excel in their vocation.

By records, it appears that artisans do not receive training to the extent that should enable them get employment in the industries, and that was the reason most of them are found in local organized labour markets and in roadside shops. Hence, going by the theory propounded by Prosser (1949) which stated that vocational training will be effective in proportion as the specific training experiences for forming right habits of doing are those of the finished skills necessary for gainful

employment, electrical trade artisans may not have acquired skills and other competencies to the standard that will enable them get employed in the industries for improved standard of living.

Finally, Prosser proposes that while every reasonable effort should be made to reduce per capita cost, there is a minimum below which effective vocational education cannot be given, and if the course does not permit of this minimum of per capita costs, vocational education shall not be attempted. Generally, vocational education is a capital intensive programme and not all the master trainers can afford to meet the minimum standard advocated in technical/vocational education by Prosser. To this end, most of them made use of improvised tools and materials in training of the apprentices under them, and with that, most of them are turned out as half baked and ill skilled artisans on graduation. To correct this, the competencies needed by the artisans' should be determined, such competencies are needed in their vocation because it will subsequently help them obtain gainful employment in the industries after their training. Prosser's theory is related to the present study in the sense that it is a guiding principles in which training of workers should be based. This assessment will expose the areas where skills and other competencies should be acquired by the artisans to improve their products and services in the society. The self actualization of artisans was not captured in this theory, hence the need for the second theory which was according to Maslow.

### **Motivational Theory of Abraham Maslow**

Abraham Maslow (1968) propounded a theory of behaviour based on the principles which among others include; that man and other organisms are permanently in want and in need. These needs are graded by the organism in the

order of importance, and that as soon as a more urgent and pressing need is satisfied, another high need immediately emerges, assumes greater importance, and automatically becomes the active determinant or organizer of behaviour. Based on the principles of human behaviour, Maslow identified seven very important human needs. The needs were categorized in their order of urgency or what is called need hierarchy and they are listed as follows; physiological needs, safety needs, love and affection needs, achievement needs, self-esteem needs, aesthetic needs and self-actualization needs.

The physiological needs, otherwise called biological or survival needs according to Maslow theory dominated and controlled the whole hierarchy of human needs and when they are in force, all other needs become relatively unimportant. In physiological needs category, we have the following needs: needs for food, water, oxygen, sex, elimination of waste products and all these are directly necessary for human survival.

The satisfaction of these physiological needs which is the most dominate in the hierarchy of human needs for the electrical trade artisans seems to be questionable. This is because the artisans needed qualitative skills and high level of proficiency in their vocation to be able to satisfy these physiological needs. To achieve these feats and to remain functional and effective, artisans need to be competent in their occupation.

This theory has serious implication in the lives of the artisans for their survival, self-actualization and to remain useful in the society. This is because there is evidence that most of the artisans are not competent, hence cannot function effectively in the society. From every indication, the competencies required by the

artisans need to be determined, because it is a step towards achieving high level of effectiveness among artisans and to make them functional, effective, proficient and useful in this age of science and high technological development. This will go a long way to improve their standard of living in the society and for their self actualization which is the utmost aim of entering into any vocation, calling or profession. To achieve this feat, trade artisans require intellectual development captured under Piaget's theory, hence the necessity of the next theory of learning according to Jean Piaget.

### **Piaget Theory of Intellectual Development**

Piaget (1898) propounded a theory of learning on human intellectual development. The developmental theory of Piaget seems to be the most logical explanation of the processes involved in the growth of human thinking, knowledge and intelligence. Piaget proposes the following: That learning is an interactive process achieved through interaction between the learner and the physical world or environment. Secondly, that cognition is a gradual and developmental process, thirdly that cognitive achievement is influenced by several factors such as organic maturation, past experiences, genetic inheritance and the quality of environment. Fourthly, Piaget theorized that intelligence or adaptive behaviour is essentially an interplay between two important psychological variables which are identified as assimilation and accommodation.

Assimilation is the effort of the individual to integrate or make the external environment to fit into its own internal cognitive schema or cognitive framework. This behaviour makes the individual attempt to restructure or recreate the environment to agree with or fit into the idea of what things ought to be. On the

other hand, accommodation is the process of changing on as previous formed cognitive structure to agree with what one observes in the environment. It is very necessary to achieve a healthy and satisfactory balance between these two opposing tendencies. To the extent that one can achieve this balance to such an extent its behaviour will be intelligent.

The theory propounded by Piaget identified three major domains of intellectual behaviour as follows:

- a) Cognitive
- b) Affective and
- c) Psychomotor domains

**Cognitive Domain** - is concerned with the strict knowledge component of our daily activities. It therefore deals with such aspects as comprehension, analysis, synthesis, evaluation and application of knowledge.

**Affective domain** dealt with a person's attitudes, relationship and sensitivities to other people and to issues.

**Psychomotor domain** is concerned with practical manipulative skills and sensory co-ordination. Such skills are easily manifested in practically oriented subjects like technical and vocational courses, physical education, and fine arts works.

Piaget Identified and characterized four prominent stages in the evolution of human intelligence, they are

1. Sensori-motor (0 - 2 yrs)
2. Pre-operational stage (2 - 7 years)
3. Concrete operations stage (7 - 11 years) and
4. Formal operational stage (12 years and above)

**Sensori - Motor Stage (0 - 2 years)**

This covers the first two years of life during which the child does not possess language nor capacity for any symbolic expression. The child's activities are based on sensory perceptions and movements, and hence the characterization of infant intelligence as sensory-motor intelligence. Although the intellectual behaviour of the child is described as rudimentary, yet this stage is critical in the overall cycle because it is from the foundations of behaviour formed at this period that subsequent higher intelligence will evolve.

**Pre-Operational Stage (2 - 7 years)**

At this stage, the children begin to use language and symbols and through this means, the children's knowledge and interaction are expanded and consolidated. Their actions are based on crude trial and error processes. Problem-solving skill is at its infancy or at the primordial or rudimentary stage. The process of teaching and learning helps the children to improve faster in applying senses in problem solving.

**Concrete Operational Stages (7 - 11 Years)**

At this stage, the children think in concrete rather than abstract manner. The children's operations are tied to specific objects and experiences and they would need concrete objects or things in front of them to perform mental actions, and hence the reason. This stage of intellectual development is referenced to as concrete operational. The children at this period master skills connection with addition, subtraction, insufficient conclusions.

Piaget stated that the stages in intellectual development are hierarchical, sequential and invariant and cross-culturally valid even though some individuals

attain the stages faster than others.

At the stage of formal operation (12 years and above) the children must have improve on the behaviour pattern acquired in the concrete operation. Thus they acquire more problem solving skills perform more concrete and qualitative works. They are thus more attended to acquire those skills required to make them better artisans. Thus at this stage most of the artisans are engaged as apprentices for learning skills. Thus the Piaget theory is quite relevant for this study. Children (12 years and above) engaged in skill acquisition should be provided with the wherewithal for acquiring relevant skills and desirable work attitudes as well as managerial and entrepreneurial skills. These competencies shall make them more productive workers.

Educational implications of Piaget's theory include that:

1. The stages of intellectual development should be taken into consideration to give room for knowledge and skills expected to be acquired at any particular stage. This is to ensure that developments expected of the individuals at the stage are allowed to take place.
2. The teacher of technology should also take into consideration the individual differences of the children at any stage of development. If individual variation is taken into account, it will be appreciated that some children achieve faster than others within the same age-grade and social circumstance. Therefore, teachers should individualize their instruction as far as possible to cater for the differing needs of pupils.
3. Piaget theory emphasizes concrete learning or learning through activity and exploration. According to him, knowledge comes through interaction with

the physical work. From the point of view of this theory, audio-visual aids seem to be very necessary.

4. The theory also advocates the problem-solving approach or discovery method in teaching. Children should therefore be given suitable project exercises to provide opportunities for them to learn through self instruction or peer teaching.
5. Learning, exercise should be arranged in a graded sequence from the more basic and fundamental to the complex so as to reflect the gradual unfolding of human mental capabilities.
6. The theory emphasize the process of thinking rather than the products. It is a process in which the children display intelligent and logical reasoning.
7. Teaching should be made informal as far as possible especially at the lower levels of education in order to sustain the attention and interest of the children.
8. Motivation and feedback (discussions) between the children and the adult will enhance cognitive development.
9. Finally Piaget's theory emphasizes that the pupils should be given reasonable freedom to express their views on the issues and to act without undue external pressure.

Teachers and parents should not impose their ideas on the children but could reason together with them.

Problem-solving or discovery approach is very important in technical and vocational education because any child given opportunity to discover and solve problems masters the procedure and skills used in solving the problem more.

Piaget theory emphasizes problem solving, concrete learning and sequential learning, which are very essential in skills acquisition for proficiency of electrical trade artisans.

### **Theoretical Studies**

Theoretical studies related to this study are reviewed as follows:

#### **Need for trade artisans in domestic and industrial electrical installation**

Artisans are workmen found at the bottom line in the hierarchy of tradesmen. Artisan according to Website (2013) is ex-apprentice who graduated from a master tradesmen after completing years of apprentice agreement. Trades are skilled occupations engaged in by people as a fulltime or part-time business (Nwafor, 2006). Therefore, they are people's means of employment or occupations in the skilled trades. Artisans are trained in different trades or disciplines. Artisans workers in various trades are mostly trained through apprenticeship system of training through imitation and observation with meager and obsolete tools and machines. Osuala (2001) pointed out that workers trained in this way cannot function effectively in the present time where sophisticated machines and tools have been produced to replace the obsolete ones.

These challenges facing artisan workers notwithstanding, there is great need for this category of workers as a result of essential services they render in the society. Such workers are needed for the installation of electrical machines, equipments, components and appliances in domestic building as well as in industries and factories. The artisans need to be competent to live up to the expectations of the society. But one discovered that a good number of trade artisans are incompetent probably as a result of the narrowness of their initial training.

A study conducted by UNEVOC (2007) shows that majority of graduates in developing countries are not self reliant, due to incompetence. Trade artisans in domestic and industrial electrical installations need retraining to keep abreast with the recent development in electricity/electronics, and to become competent. Hence, the essence of this study on determining the competencies required by trade artisans in domestic and industrial electrical installations.

### **Training of trade artisans and their functions**

Trade artisans are skilled manual workers who produce items that may be functional in a limited quality. They carry out other services like electrical installations and maintenance of electrical appliances in homes and industries (Ogbuanya, Abdullahi & Ado, 2013).

This category of workers are trained to be skilled and self-reliant on graduation. Skills in electrical installations are acquired through apprenticeship scheme as in the case with other artisans or through technical colleges for technical college graduates. Ama (2000) reported that the result of NABTEB in May 2000 shows that electrical trade has the highest rate of failure. This tantamount to the fact that many technical graduates especially those in electrical installations are jobless. Osuala (2001) posited that technical college graduates are jobless not because of absence of job opportunities in the industries but because they lack electrical installation competencies enough to take up the available skilled jobs. By extension, incompetence also abounds among trade artisans in the society. There are lots of evidence that most of the other trade artisans are incompetent and could not provide the products and services required by the society. Hence, Okoro (2006) stated that the ultimate test of a good workers is not how much factual information they can

remember but what technical skill they can demonstrate in performance in their technical fields of employment.

The problem faced by trade artisans in electrical/electronics is hinged on changes in technology. Electrical/electronics is the pivot of technological growth and development. Due to technology growth and development, new products of high precision are produced and imported into the country. Such products require expert skills to install, operate and maintain them. One found out that the trade artisans we have are not competent to take up such responsibilities. According to Okorie (2001), the standard of performance of Nigerian technicians in general is at the moment very low thereby retarding the overall productivity of the Nigerian economy.

It was in recognition of the effects of incompetency among the technical workers, and the result it has on Nigerian economy, that prompted this study to determine the competencies required by trade artisans to become proficient in performance in their occupation.

### **Competencies required by trade artisans for effective performance**

Competencies required by electrical trade artisans for effective performance in the current era are highlighted as follows:

#### *Theoretical Knowledge Competencies required by Electrical Trade Artisans.*

For effective and meaningful management of electrical workshop, the workshop manager should have adequate theoretical knowledge for teaching theoretical aspects of practice training course in which skilled workers are educated and trained for occupations in the electrical industry. The manager should possess general and special technical theory in technical education, the aim of which is to

educate and train artisans to become technicians or craftsmen. The workshop manager is one who is competent to instruct and train apprentices. Such managers are masters of their craft and have acquired their skills through long years of experiences, but in most cases short of theoretical knowledge content. Elobuike (2006) stated that theoretical knowledge has to do with the "why of work" experience and is basic for intelligent work performance and process. Elobuike further stated that the related theoretical knowledge of technical workshops management includes, technical information, vocational concepts, scientific knowledge, and work experiences necessary for engineers, technologists, industrialists etc, to improve and solve industrial problems. Theoretical knowledge increases the productivity and efficiency of learners by increasing the level of cognitive skills possessed by the learner.

Becker and Mincer in Babalola (2003) posited that theoretical knowledge is specialized knowledge used to execute specific machines operations, safety guards, and to develop the whole person psychologically, physically, mentally, socially, and occupationally. Theoretical knowledge is apparently related to general education. General education makes one to learn some clean habits, change one's thinking pattern and decision making process. According to Elobuike (1999), general education is a universal education for all persons (children, youths and adults) and is needed for developing aptitudes, abilities and behaviours considered desirable in the society. Therefore, it will be difficult for anybody who is not especially exposed to general education to understand the theory of any trade.

Giachino and Gillington in Uzoagulu (2002) maintained that any vocational technical graduate irrespective of the level should be able to apply some principles

and theories of the trade or occupation for solution of problems associated with the area of practice. Hence, any artisan who is theoretically handicapped tends to act on guess work because of the half baked and unbalanced knowledge of the trade.

Okorie in Nwafor (2006) explained that even if the local artisans function very successfully in the labour market, they remained in the lowest level cadre of manpower personnel because they lack the theoretical knowledge of the trade. This theoretical knowledge could guide them to obtain some trade or technical qualifications. Theoretical knowledge is very essential for artisan trade because it will make them full-fledged skilled workers, who would be able to determine the functions of equipment and machines, use of materials and tools and as well as master with confidence the care and safety measures in the trade. In other words, lack of theoretical knowledge can make the artisans to be deficient, especially in the reading and interpretation of simple working drawings and manual of operation of equipment or machines introduced in their area of occupation.

Okogba in Nwafor (2006) criticized the illiterate and semi-literate artisans who lacked theoretical concepts but merely passed through training programmes. Nwafor argued that they will not meet the labour market standards/requirements. Thus, Elobuike (1999) finally concluded that theoretical knowledge guides the practical aspect of getting a job/work done, which implies that theory should come before practice. The implication of this statement is that every trade artisan should possess theoretical knowledge which is a pre-requisite for their success in acquiring practical skills and becoming competent in their vocation. From the discussions, artisans in domestic and industrial installations are expected to possess theoretical knowledge competencies vital to their vocation.

*Technical competencies required by Electrical Trade Artisans*

Technical competencies are regarded as indispensable attributes of any occupational calling, hence technical workers would require such competencies to proficiency level. Thus competencies of technical workers, artisans inclusive could determine their usefulness in an occupation.

The need for the artisans to improve upon their initial training is important. For instance, Uzoagulu (2002) stated that for technical workers to produce maximally and certainly increase goods and services, their techniques for increasing productivity through training should be improved. Uzoagulu further stated that, invariably, the increased productivity of technical workers will help raise the living standard of the people. And if this is not achieved, goods and services needed in the society will be not available. Uzoagulu further posited that the training of a technical worker is very essential, because it goes to reposition the skill and competence of the worker. Osuala (2001) outlined the weaknesses of the informal system of training artisans as follows;

1. that informal system of training artisans is narrowly structured
2. the training of artisans only emphasized practical skills necessary for survival in the labour market,
3. the physical facilities for training are below required standard,
4. the training programmes lack the theoretical base,
5. there is no documentation of concepts in acquisition of skills,
6. learning is by rote and imitation of the master artisans and,
7. the result of their works are always produced by trial and error.

In view of all the shortfalls in apprenticeship training as listed above, electrical trade artisans which were trained that way must have so many shortcomings. Thus, it becomes imperative to determine the knowledge and competencies required by such artisans to remain productive and useful in the society also for their economic upliftment. Okoro in Okozor (2006) found that the majority of apprentice artisans trained in Nigeria are trained by very small business/industrial concerns and training given is often quite narrow; apprentice training programmes are inadequate because they lack the theoretical content; their creativity and ability to innovate are not well developed. They are unable to deal with situations which are not exactly like the ones already experienced; i.e. they cannot easily transfer knowledge and skills acquired in one situation to other situations, and apprentices lack the avenue to obtain new information relating to their occupational areas.

The implication of the findings of Nwafor in Okozor (2006) is that the artisans need to improve upon their initial training which they acquired through apprenticeship training by upgrading themselves in theoretical knowledge and practical skills. One of the principles of vocational education by Prosser (1949) advocated that more practice in vocational education and training should be more effective in proportion if the specific training experience for forming the right habit of thinking, and doing are repeated to the extent that those habits become fixed to the degree necessary for gainful employment. Nneji emphasized that competencies should be acquired through practice, and that the more a skill in doing a job is produced, the more mastery of it is gained.

On the other hand, Alio (2006) found that the technological expertise to execute and manage the nations industrial and construction projects are limited.

Hence, Alio emphasized that the current growth of the economy has far outstripped the availability of the trained personnel, and higher productivity will only result when there are more skilled people to operate sophisticated machines as well as those to maintain them effectively. The implication of this findings is that concerted efforts should be made towards upgrading the knowledge and practical skill competencies of artisans and craftsmen to meet up with the challenges which is the result of technological growth and development.

In another development, Olaitan (2006) observed that the rate of manpower production compared with the needs of the society for technological development has never been encouraging. This situation was most evident in the developing countries especially in Nigeria. Therefore, Osuala (2008) called on every Nigerian to acquire a necessary skill to contribute effectively to the manpower development in the country. Therefore, the need for employable skills for all and sundry in Nigeria cannot be over-emphasized. The menace of unemployment besieging Nigeria was the result of many school leavers and graduates coming out of schools without practical skills. Makoju in Oluka (2006) observed that there is no employment for those without employable skills. The observation made by Makoju suggested that people should not rely solely on paid employment but should be trained or retrained in skilled jobs, which can offer them employment especially on time of severe unemployment.

Olaitan (2006) also observed that many developing countries suffered from serious shortage of qualified manpower at all levels of workforce. Nwaokolo (2008) also posited that a nation could only survive if the citizens were adequately equipped to meet the moral, scientific and technological challenges of the modern

age. From the foregoing, it has been discovered that Nigeria has not trained enough qualified and skilled manpower who are capable of taking up the challenges of the modern society. As a result, there is need to assess the competencies required by youths and adults in their respective trades. The study of Okogba in Nwafor (2006) revealed that artisan training was loosely structured; the duration of apprenticeship was not specific, most physical facilities were below required standard and the emphasis was mainly on practical skills for survival. Furthermore, that the programme lacked theoretical knowledge base, there was no documentation of concepts except rote learning (memory) and imitation of the master model which provided results through trial and error.

Training of skilled and qualitative workmen cannot be achieved through trial and error method of carrying out operations and as a result, there is need for systematic and rightful procedures and methods of training advocated through vocational education and training (TVET). Hence, there is need to determine, the technical competencies required by artisan workers within respective vocation.

#### *Entrepreneurial Competencies required by Trade Artisans*

Entrepreneurship is the process of bringing together creative and innovative ideas and coping with management and organizational skills in order to combine people, money and resources to meet an identified need, thereby creating wealth (Ugiagbe, 2007). Hisrich and Peters (1995) defined entrepreneurship as the process of creating something different with value by devoting the necessary time and effort, assuming the accompanying financial, and social risks, and consequently, receiving the resulting rewards of monetary and personal satisfaction and independence. The process of bringing ideas, people and resources together with the

objective of creating wealth is normally carried out by an entrepreneur. Therefore, according to Okpara (2000) an entrepreneur is a human bulldozer, who can convert a stumbling block into a stepping stone, a creative and aggressive innovator, and an individual who promotes necessary relationship required for a new business to come into existence. Entrepreneurs manage and operate the enterprise once established and risk their capital in new venture in the business of making profits.

The success of any business is determined by the quality of the entrepreneur. Since the entrepreneur cannot offer what they do not have, they must be adequately equipped for business to thrive. Hence, the entrepreneur needs to be acquainted with the entrepreneurship skills necessary for managing and operating business ventures in order to maximize profit. Therefore electrical trade artisan could become an entrepreneur to augment the original business of electrical works to make ends meet. The entrepreneurship skills needed by the electrical trade artisans could be acquired through entrepreneurship education. Aina (2006) stated that entrepreneurship education is the key that unlocks the door to industrialization and self-reliance. Education for self-reliance seems to be the answer to unemployment, youth restiveness, high rate of crime and other social vices. The artisans need entrepreneurship education to equip them with skills that will enable them to establish small scale business related to their area of occupation. The proceeds of the business will support them in their day-to-day life at home and in the society.

Entrepreneurship is all about creativity, innovation and risk taking, as well as the ability of the entrepreneur to plan and manage projects in order to achieve objectives. An entrepreneur is a person who put together or assemble resources and

capital to achieve set objectives. Therefore, entrepreneurship education is a launching pad towards alleviating poverty. Akintola (2001) posited that entrepreneurship is a veritable employment alternative tool to create wage employment and as a Panacea to graduate unemployment.

On the other hand, Nwaokolo (2003) defined entrepreneurship as a venture that involves taking up business enterprise quite distinct from obtaining a paid job. Okon (2011) posited that entrepreneurship is the willingness and ability to identify business opportunities through creativity and innovation, and establishing necessary machinery to run business enterprise successfully. Entrepreneurship is concerned with the individual's persistent pursuit of opportunity to create wealth through innovation, creation of products or services that meet customers' needs, using scarce resources in a way that results to the growth of an enterprise, which satisfies the expectation of stakeholders whose roles sustain the business.

Ikeme (2007) was of the opinion that through well planned and executed entrepreneurship education that the Nigerian youths will learn to be happy and fulfilled persons. Ikeme furthermore, stated that through entrepreneurship education, the youths will be productive and committed as employees or employers and use their unique abilities for the development of communities. Finally, Ikeme maintained that through entrepreneurship education national and global goals will be achieved rather than the youths abandoning their countries for the so-called greener pastures overseas.

In another development, Akpomi (2009) stated that entrepreneurship education focuses on developing understanding and capacity for pursuit of entrepreneurial behaviours, skills and attributes in widely different contexts.

Akpomi maintained that entrepreneurship education could be portrayed as open to all, and not exclusively the domain of the high-flying growth-seeking business persons. This shows that electrical trade artisans also need entrepreneurship education to enable them acquire skills to be used in setting up business ventures. The success of such business venture will help the artisans to augment whatever comes out of their original job or work. Akpomi further pointed out that different individuals will have different mix of capabilities for demonstrating and acquiring entrepreneurial behaviours, skills and attributes. These behaviours can be practised, developed and learned, hence it is important that all and sundry are exposed to entrepreneurship education.

To achieve the desired objectives of entrepreneurship education in Nigeria with respect to the electrical trade artisans, the researcher was of the opinion that the approach to teaching must change from more lecture method to practical demonstration of the activities in the programmes by the trainers. This statement has great implication for the educators and trainers including educational planners to develop and execute programmes which are appropriate for preparing youths and adults for the world of work. Programme of this kind will help artisans who have gained some theoretical knowledge to acquire more practical skills to the level that will equip them to establish and progress in their own business. When the said objective is adequately addressed, with government supportive programmes, the problem of unemployment besieging the country will be a thing of the past.

The importance of entrepreneurship education in this country cannot be overemphasized. For this reason Aina (2006) maintained that the aims of various government to combat poverty through the establishment and creation of poverty

reduction programmes have failed because youths, adults and graduates of education system lack the practical skills which can be acquired through entrepreneurship education programmes.

To avert this, Alaezi (2009), Eze and Okoroafor (2012) suggested that drastic measures should be taken by way of curriculum tinkering, curriculum inclusion and exclusion in favour of entrepreneurship education. This suggestion made by Alaezi as well as Eze and Okoroafor must be put in place to ameliorate the problems of unemployment in the country. Hence, Alaezi maintained that no country can move forward technologically, industrially and economically without strongly developing the culture of poverty reduction, creating wealth, and employment generation. Skills and competencies to achieve the fit include, managerial skills, administrative skills, innovative, enterprising skills, communication skills, investigative problem solving skills and other special skills which are prospect of the future hope of such country (Alaezi, 2009). The implication of the statement made by Alaezi is that Nigerian youths and adults, including electrical trade artisans and other artisans need to acquire entrepreneurship competencies for their optimal survival to avert high rate of unemployment. The researcher was of the opinion that the high rate of unemployment in the country was as a result of poor orientation accorded by our colonial master that brought western education in Nigeria while collar profession were embraced in expense of blue colour. Profession which lead to so many graduates seeking for jobs instead of being jobs creators as emphasized in entrepreneurship education. Therefore, there is need to emphasis entrepreneurship education in the country.

*Management Competencies Required by Trade Artisans*

Management competencies are required in the effective running of an artisan workshop. They are such competencies that involve the application of management skills in planning and organizing a workshop. Nwokike (2014) posited that management involves planning, organizing, staffing, consulting and directing the activities of any business establishment. Electrical trade artisans require a lot of managerial functions to succeed in their vocation. The managerial functions required of a craftsmen according to Alio, (2006) among others include effective management of materials, effective utilization of materials, adequate supply and storage of materials, time management, effective management of records and appropriate management of servicing equipment. Godey in Alio (2006) maintained that effective managerial skill is not "by guess and by Cosh" but the craftsmen must understand to apply positive methods, uncover ways to improve their work and discover inherent weaknesses so as to take positive steps for making accurate forecasts.

From the foregoing, one can conclude "that only theoretical and technical competencies can not make a trades man competent but requires management and other contemporary competencies to succeed in the running of business. Nwokike (2014), opined that one of the major causes of small business failure in Nigeria has been lack of managerial skills by the owners and operators. Managerial skills are prerequisites for effective management of business enterprises. Alio and Uzo (2010) maintained that theoretical and technical competencies alone are not adequate for effective professional practice, hence, management competencies are necessary attributes that must have to be acquired by professional tradesmen

including those in electrical trade.

Management can then be defined as the activities of the tradesman to coordinate the resources in an organization through the process of planning, directing and controlling in order to achieve the organizational goals. Draft (2000) defined management as the attainment of organizational goals in an effective manner through planning, organizing, leading and controlling organization resources. Osuala (1995) defined management as the processing of planning organizing, staffing, directing and controlling the total business activities and the leading of people so that the use of material, men and equipment results in efficient achievement of organizations objectives. Management is the art of getting things done through people. It is the process of harnessing the diverse resources (materials, finance, people and time) in a manner as to achieve what the organization set to achieve. Griffin (2002) stated that management equally involves good planning, organizing, directing and controlling of workers and materials to effectively and efficiently meet set objectives of an enterprise or organization.

Electrical trade artisans are not left out in this art of management. This is because they need to plan, organize and direct their activities in the workshops to achieve maximally in their vocation. Therefore, for the trade artisans to be successful entrepreneurs, they should be able to use these management functions effectively in order to succeed in their professional practice. There are certain attributes useful and inherent in managing businesses which are imperative to acquire in order to achieve the objectives of the organization. It is therefore this process of achieving an organization's goals through the coordinated performance of five specific functions that Osuala (1995) referred to as the classic management

functions. These managerial functions which has been identified as the art of planning, organizing, staffing, directing and controlling are essential attributes of any successful business tradesman or entrepreneurs and they cannot do without such skills and competencies.

Trade artisans in electrical installation need management competencies to enable them plan, design, direct, control and exercise their installation works successfully and effectively too. These tradesmen needed to be provided with right information on managerial functions inherent in their trade.

Elobuike in Alio (2006) maintained that to succeed in any business activity, that the entrepreneurs or the business managers should have good background of the crafts and also adequate managerial competencies of the trade or occupation. Elobuike further stated that these competencies most of the time are either not properly acquired or not learnt at all by the technical tradesmen, hence, in technical training, that aspect of skill development has always been neglected and the consequences are felt in poor organization and planning of the technical workshop. Elobuike in Alio (2006) also observed that many person's perceive the management of small business as an exercise that requires no serious preparation and education. Alio further stated that craftsmen's workshops appear to be in the group where this problem is most pronounced, he reason been that their occupational preparation backgrounds varied significantly.

Alio maintained that for entrepreneurs to succeed in their business, they must adopt certain strategies like hardworking, good organizational ability, good interpersonal relationship, pride in their work and effective decisions in order to achieve the goals of their organizations. Outside these, or in total negligence of

these attributes as indicated above the business manager or entrepreneur may fail in his business. This is in conformity with what Alio (2006) emphasized that business failures are usually associated with lack of managerial exercise, inadequate financial capital and credit facilities, deploying too much capital into fixed assets, over spending from business earnings and successive unplanned expansion of business. From the discussions, one may be convinced that managerial competencies are inevitable and are required by the electrical trade artisans for successful and efficient operation of their workshops. Managers as top leaders of their organizations decides, plan and direct how the activities of such organization should be carried out.

Hornby (1998) defined a manager as one who manages, one who is in-charge, one who takes decision in a business organization.

Hence, the management of an organization or business enterprise rests in the shoulder of a manager. Etuk (2002) sees management as the process of directing, administering or running a business. It is essentially directing human efforts, energies and co-ordinating the whole team, and giving vital leadership that will lead to achievement of the goals of the organization.

Akamobi (2001) pointed out that for the manager to take a wise decision, he should be provided with very useful information for planning and control of operations. In conformity with the above assertion, Alio (2006) stated that for craftsman to effectively do his work of servicing, repairing and maintaining of the customer's electrical/electronics, products, he should be able to gather useful and necessary information which will enable him to do the work well. Tradesmen need skills and competencies in planning and organizing their workshops or to execute

projects in the most efficient way. Management competencies needed by technical workers among others include financial management, book keeping, marketing, personally skills, tool and equipment management, time and public relation management (Alio, 2006).

Proficiency in managerial skills can be acquired through adequate training and education, but you find that the majority of managers learnt valuable skills in management through trial and error. Osuala (1995) identified management incompetence as one of the specific reasons for business failure since some managers do not have what it simply takes to run a business. Osuala emphasized that management skills of small business can be learnt as managers or entrepreneurs are not born but made.

Also, Akintola (2001) pointed out that one of the problems facing entrepreneurs is lack of managerial skills and experience. He suggested that entrepreneurs should have good training in the art of management. The entrepreneurs in business related area needed managerial skills since they also play the role of managers and therefore are responsible for the attainment of their organizational goals and objectives.

Akintola was of the opinion that managerial skills and competencies required by managers of small businesses are both conceptual and technical. Conceptual skills according to Akinola are those skills required to relate parts of the company's work to the whole, while technical skills are those skills required for turning out the actual products or services of the firm, and equally needed for performing specific activities within the organization.

Therefore, management competencies include the skills in decision making, control and negotiation, essential in creating and growing of a new business venture. Anyakoha (2009) identified some important management skills required by the entrepreneurs to successfully establish, run and manage a business enterprise to include

1. The ability to set appropriate business goals,
2. Plan effectively for goal attainment,
3. Organize resources for goal attainment,
4. Inventory control and record turnover,
5. Appraise employees for growth and development,
6. Manage time and meet job schedules,
7. Make appropriate use of feedback, and
8. Evaluate the workers activities in the firm.

From the discussions so far, one has come to recognize that the importance of management skills and competencies for the trade artisans and business entrepreneurs cannot be over emphasized. And some of the lapses exhibited by the trades men in their professional practices can be attributed to their lack of managerial competencies. Ezeji (2006) pointed out that tradesmen are not reliable in keeping time schedule and also have poor value system. Ezeji further stated that these group of workers (artisans) have poor customer relationship due to the narrowness of their training. All these The implication of the Ezeji statements is that there is great need for tradesmen to acquire managerial competencies necessary for the take off and successful operation of their businesses in their area or vocation. For instance, Nwokike (2014) suggested in a study: that business

education students should have training in the art of management. Furthermore, they should be competent in undertaking the basic steps in starting business, setting appropriate goals. They should plan, direct, and effectively control business operations, organize human and material organization with their managerial abilities. From the above discussions it shows that managerial competences may be lacking in most workers. Suggestions are therefore made that adequate training should be given to workers to acquire managerial competencies to run businesses successfully. This leads then to one of the objectives of this study, to determine the extent to which managerial competencies are required by electrical artisans.

#### *Work Attitude Competencies required by Trade Artisans*

Right attitude to work is a competency that must be acquired by artisan workers to enter and progress in an occupation or profession. Uzoagulu (2002) defined attitude as the sum total of one's intentions, feelings, prejudices, biases, perceived notions, ideas, threats and convictions about specific things or situations. The definition of attitude by Uzoagulu has serious implication in the training of artisans, because, possession of theoretical knowledge and practical skills without blending it with right attitude to work will not lead the artisan anywhere, This is because, the level of production of firm or an industry can be lowered or increased depending on the attitude of workers towards their work. Ezeji (2006) posited that good work attitude should be exhibited by workers to improve productivity and avoid increasing wastes. Olaitan (2006) opined that vocational preparation are necessary ingredients for the development of attitudes and knowledge for optimal job performance. Vocational preparation is a combination of education and training based directly on experience at work.

Through a planned and integrated programme of education and training, a better start in working life can emerge to improve job performance. Olaitan (2006) stated that vocational and pre-vocational preparations consider the acquisition of skills and the development of attitudes and knowledge which enable young people to play their part in the working community and help them to work more effectively. Olaiya (2008) opined that possession of relevant skills and knowledge as well as appropriate use of rewards system enhances positive attitude of employees towards their work. This implies that employees who receive proper training and education in their occupational areas are happier and more confident in their jobs. It follows that such employees will produce more with less wastages of materials, show more interest on the job, come to work punctually and in most cases are more efficient and more cooperative than untrained workers (Olaiya, 2008).

Okoro in Okozor (2006) found that well trained workers were more efficient and productive. They work faster, understood the job better, made less mistakes in work and are more likely to be promoted. They found their work more interesting, derive more pleasure and more job satisfaction from their work, suffered less boredom and tension; they were also healthier and used their expert knowledge, technical skills as well as good work attitude to establish and advance their business.

On the other hand, Ezeji (2001) was of the opinion that the level of training workers undertook will determine their attitude to work. For instance, Ezeji pointed out that roadside workshops managers have low level of honesty, and are always disposed to cheating customers. They find it difficult to ensure that, materials, tools

and equipment are kept safe.

Another factors that influence workers attitudes to work, increased productivity and honesty in the discharge of their duties is the reward accruing from the work done. In otherwords, there should be correlation between efforts expended by an employees and the reward they receive from the organization. This is because, when a hardworking employees observe that there is no equity in distributing organizational dividends, and that what they gets after the month is not commensurate with the work done, their attitude to work might be negatively affected.

Elobuike (1999) described trained workers as those who:

1. Work without necessary supervision,
2. Work cooperatively with their colleagues,
3. Accept instructions with positive attitudes,
4. Willingly accept safety practices,
5. Left work station area clean and orderly,
6. Keep accurate records,
7. Dress as required on the job,
8. Return tools and equipment in a ready to use condition,
9. Avoid wasting materials and supplies,
10. Attend work regularly and on time,
11. Avoid distracting other co-workers, and
12. Avoided Horse playing while at work.

On the other hand, good qualities of trained workers are sustained through good work attitudes. Ezeji (2006) stated that good work attitudes required by workers

include, punctuality to work, good personal appearance and neatness, care of tools, machine, equipment and materials, initiative and good work judgment. Others are co-operation and dependability, interest of work and workers, acceptance of instruction and correction, respecting the right of other workers, confidence in ones ability, resourcefulness and attention to details and ability to apply safety precautions at work and outside work. All these attitudes mentioned above should be acquired by workers or artisans through appropriate training. Ezugu (2001) remarked that formation of good habits entails thinking and doing the right things over a long period of time so that they become part of the person's consciousness. Therefore, to inculcate the right work attitudes to trainees, Elobuike (1999) reveals that good work attitudes will achieve the following:

1. Increase work performance in graduate recruits
2. Reduce start-up cost and time spent on orientation;
3. Reduce occupational accidents;
4. Guarantee success at work entry point,
5. Reduce the amount of anxiety and factory phobia;
6. Creates trainees confidence and assurance in chosen career and
7. Reduce employees' turnover and occupational migration.

In the same view, good work attitudes include the ability to; organize work, monitor personal outputs, solve work related problems, take initiative when there is the need to do so, schedule work effectively, speak and write intelligently, follow instructions strictly and develop the desire to progress in life as a worker and as a good citizen (Elobuike 1999).

The observations made by Ezeji (2006) and Elobuike (1999) imply that there is a positive relationship between trained workers and their attitude to work. For instance, a trained worker appeared to be more co-operative, more disciplined and work harder to achieve the organizational goods and are more effective than untrained worker who have the tendency of displaying aggressiveness and low productivity. This follows a slogan which says that "bad work man always quarrels with his tools" Therefore, good work attitudes would appear to be the essential training needs of artisans especially in electrical trade to ensure team work, reduce industrial accidents and increase productivity. Elobuike (1999) reported in his study that graduates of technical college possessed a very good work attitude as regards to regular attendance to work and willingness to work overtime when necessary. Hence, previous studies showed that some workers possessed work attitude competencies, but the present study will tend to determine the extent to which these competencies are required by these artisans for increase productivity in their vocation.

On the other hand, the goals of industrial installation according to NBTE (2008) are to provide the trainees with the knowledge and skills, which will enable them carry out all types of industrial/factory installations. Industrial installations also involve high voltages ranging from 415v and above which is transmitted through overhead conductor, underground and trucking, which could be in alternating current (AC) or direct current (DC) for the use of machines and equipment that control gears for effective protection (Gupta, 2005). Cable jointing as a specific skill of electrical installation provides the trainees with knowledge and skills to undertake with proficiency various methods of cable jointing and

terminations. Electrical installation (domestic and industrial installations) are trade areas of electrical trade, and artisans in the field acquire their skills through apprenticeship and sometimes through formal education. Specifically, electrical installation is a subject taught in technical colleges. This course is aimed at making apprentices and graduates of technical colleges to acquire skills and be self-reliant on graduation. Available reports according to Osuala (2001) showed that products of technical colleges are jobless as a result of some measure of in-competence in vital trade areas.

Osuala (2001) further stated that they are jobless not because of the absence of job opportunities in the industries but because they lack electrical installation competency enough to take up the available skilled job. Also, a study conducted by UNEVOC (2007) showed that the majority of graduates in developing countries are not self-reliant due to incompetence. By extension, this can also show that products of apprenticeship system of training particularly in electrical trades may be incompetent and cannot take up available jobs in the industries. That may be the reason most of the artisans end up in establishing mini-shops by the road side and live on penury coming out of their daily duties. As a result of this state of affairs, the competencies required by these artisans in domestic and industrial installations need to be determined as a right step towards their job improvement.

### **Empirical Studies**

Related empirical studies to this study are reviewed as follows:

Ugwu (2010) conducted a study on cognitive development of senior secondary school physics students. The objective of the study was to examine the importance of knowledge of cognitive development of students in physics

education. Three research questions guided the study. Survey research design was employed and clustered proportionate random sampling technique was adopted to select 25 secondary schools and 494 students studying physics in second term of senior secondary school SS III in Enugu State in 2007 academic year. The scores were counted and the sum converted to a scale value on a Rasch scale. From the results, the proportion of each students, level of cognitive development was calculated and reported in percentages. The findings of the study showed that different developmental levels of cognitive ability exist among college students as determined by Piaget's measures and it is clearly demonstrated. Accordingly, the findings showed that there are concrete operational level of cognitive development, and formal operational level of cognitive development. Ugwu's study recommended among others that stakeholders in education should widen the contents of cognitive development to be taken cognizance of all levels of educational system.

Ugwu's study is related to the present study in that the study dealt on the cognitive development of students of SS3 in physics according to Piaget. In the present study, Piaget's theory of intellectual development is one the theories in which the study was anchored. An important implication of Ugwu's findings for the practice of physics education is that teachers need to examine students' cognitive knowledge before abstract concepts are introduced. Also, the present study advocated that the different stages of intellectual development according to piaget should be observed in the training of electrical trade artisans to eliminate the role memorization of assimilable materials that may lead to frustrations and intellectual stagnation when the stages are not duely followed. Ugwu' s study and

the present study are similar in objectives, that is in cognitive development to remove imbalance and frustration among students in linking theories to practicals. The present study differs with Ugwu's study in terms of wider scope of the research questions and hypotheses, and also in the field where the study were conducted.

Bakare (2010) in South Eastern States of Nigeria conducted a study to determine the effect of guided discovery approach on the cognitive achievement of students in electrical installation and maintenance practice in technical colleges. Bakare used two research questions and two null hypotheses. A quasi nonrandomized control group, pretest — post test design was used. The population of the study comprised all 275 second year electrical installation and maintenance practice students in 15 technical colleges in South Eastern states. The instrument for data collection was electrical installation and maintenance practice cognitive achievement test.

Mean and standard deviation were used to analyze the data for answering research questions while analysis of covariance (ANCOVA) was used to test the null hypotheses at 0.05 level of significance. It was found that the students taught with guided discovery approach had higher mean post test scores in the electrical installation and maintenance practice cognitive achievement test than those taught with traditional method teaching. Based on this findings, it was recommended that electrical installation and maintenance practice teachers should always employ guided discovery as teaching approach.

This study is similar to the present study in the sense that both studies dealt with electrical installations, but differs in levels of training. For instance, the

study was conducted using technical college students while the present study dealt with artisans and supervisors as respondents. The study of Bakare was quasi experimental study, but the present study used survey research design. The two studies differs in objectives, in the sense that Bakare's study was to determine the effect of guided discovery approach of teaching electrical installation and maintenance practice while the present study was aimed at determining competences required by trade artisans for domestic and industrial electrical installations.

Atsumbe, Okoro and Ogwo (2012) conducted a study on practical skill improvement needs of Technical College Mechanical Engineering Craft practice curriculum in Nigeria. The study was designed to determine the practical skills needed for the improvement of the curriculum of technical college mechanical engineering craft. One research question and one hypothesis guided the study. A survey research design was employed. The study was conducted in the North Central States of Nigeria where 28 industries were sampled for the study. Using purposive sampling, 60 mechanical engineers, 100 technicians and 150 craftsmen were used for the study.

The instrument for data collection was a 48 items statements structured in five point rating scale questionnaire developed by the researchers. Mean statistics was used to answer the research question and ANOVA was used to test the only hypothesis of the study. Findings of the study indicated that the three groups of respondents agreed with all the items proposed as additional practical skills required for the improvement of technical college curriculum. There was no significant difference between the mean responses of the engineers, technicians

and craftsmen on practical skill needed for the improvement of technical college mechanical engineering craft practice curriculum.

The study of Atsumbe, Okoro and Ogwo is similar to the present study in the objective of determining technical or practical skills required for improvement in practice. However, the study of Atsumbe et al was on technical college mechanical engineering students, while the present study is on trade artisans in domestic and industrial electrical installations. Both studies used 5-point rating scale of questionnaire for data collection, but analytical tools are different and the present study is wider in scope with five research questions and 10 null hypotheses.

Adam (2011) in the upper east region of Ghana conducted a study on challenges facing technical institute graduates in practical skills acquisition. The purpose of the study was to explore and describe the challenges confronting technical institute graduates in practical skill acquisition. A descriptive survey was adopted for the study. Four research questions guided the study. The simple random and purposive sampling technique was used to select a sample size of 434 respondents drawn from the two municipalities where the technical institutes are located. Data collected through questionnaire were analyzed using mean statistics.

The study revealed that inadequate supply of instructional materials, large class sizes, inadequate training facilities among other factors led to ineffective and inefficient training of students while emphasis is placed on passing final examination. Recommendations made among others include that the stakeholders should complement the government's effort in the provision of training resources and students should be encouraged to purchase their own basic tools with girls

given special packages.

Adam's study is narrow in scope with four research questions and no hypotheses while the present study had five research questions and ten null hypotheses. The study of Adam was geared towards determining the challenges facing technical institute, graduates in practical skills, while the present study is to determine the competencies required by trade artisans in domestic and industrial electrical installations.

Adam's study is similar to the present study in the design and both studies dealt with skills acquisition.

Tajudeen (2015) conducted a study on acquisition of entrepreneurial skills by polytechnic students in Osun State, Nigeria. The paper assesses acquisition of entrepreneurial skills by Polytechnic students in Osun State. Four (4) research questions and three (3) null hypotheses guided the study. Survey research design -was used. The population comprised all the polytechnic-students in High National Diploma (HND), and the sample comprised 300 participants from purposefully selected three government — owned polytechnics in Osun State. The research instrument was a structured/open-ended questionnaire which was divided into two Sections. Responses were based on a four-point rating scale. Agree (1), Strongly Agree (2), Disagree (3), and Strongly Agree (4).

The results showed among others that there are over 50 entrepreneurship based courses offered in polytechnics in the state, availability of relevant skills training facilities were lacking, and students' attitudes towards entrepreneurial skills acquisition were poor. Tajudeen recommended that all stakeholders in

polytechnic education should spare no effort in ensuring availability of entrepreneurial and vocational skills acquisition facilities in polytechnics and that acquirable entrepreneurial skills should be embedded in all courses of the study offered in polytechnics. The similarities of Tajudeen's study and the present study are in their objectives — to assess entrepreneurial skills acquire by students, and design of the studies - which was survey. There exist so many dissimilarities in the two studies for instance, the population of Tajudeen's study was not determined but used a sample for his study. While the present study used the entire population, hence there was no sampling.

Tajudeen also used descriptive and inferential statistical tools in the analysis of data but mean and standard deviation was used to answer the five research questions of the study, while z-test was used to test the 10 null hypotheses of the study at 0.05 level of significance. The present study was necessary because while Tajudeen study determined acquisition of entrepreneurial skills by polytechnic students, the present study determined among others the entrepreneurial competencies required by electrical trade artisans hence advocating the acquisition of the stated competencies right from the grass root level.

Nwafor and Abuka (2015) conducted a study with the objective of identifying the entrepreneurial, technology and vocational skills needed by technology and vocational education (TVE) students for economic empowerment. Three research questions that guided the study were answered using mean and standard deviation. Two hypotheses were formulated and tested using t-test at 0.05 level of significance. A descriptive survey design was used for the study. A

sample of 422 students and lecturers from universities and colleges of education in Enugu State was used. A 26 items questionnaire was the instrument for data, validated by three experts, while reliability test was equally carried out on the instrument using Cronbach Alpha with the result of 0.85 as the reliability coefficient.

The study revealed that entrepreneurial, technical and vocational skills such as trading skills, basic management skills, knowledge of distribution strategies, computer skills, etc are needed by TVE students for economic empowerment. The study also revealed that lack of equipment/facilities and inadequate skilled manpower are problems militating against effective acquisition of skills needed by TVE students. Based on the findings of the study, some recommendations proffered among others include that technology education must be given due attention by the government, and that government should provide adequate infrastructural facilities needed by TVE students for economic empowerment. The study of Nwafor and Abuka and the present study are similar in design but differs, in scope, population and in some of the statistical tools used for analyzing data collected for the study.

This study identified entrepreneurial skills needed by TVE students for economic empowerment, but the present student sought to determine the five competencies requested by trade artisans in domestic and industrial electrical installations for their effective performance in the industries including entrepreneurial competencies.

Okoro (2015) conducted a study on Assessment of Management competencies possessed by postgraduate university business education students to

handle entrepreneurship business challenges in Nigeria. The study assessed the management competencies possessed by the university postgraduate business education students to handle entrepreneurship business challenges in Nigeria. One research question and five null hypotheses guided the study.

Descriptive study design was adopted for the study. The population used as the sample, consisted 388 business education graduates who are currently running their postgraduate programme in universities in the south- south and south-east geopolitical zones of Nigeria.

Mean and Standard deviation were used to answer the research questions while z-test was used to test the five hypotheses of the studies at 0.05 level of significance. The results showed that business education graduates are competent in ability to plan for small or medium scale business, ability to organize small scale business, ability to source funds for the running of a small scale business among others. It was recommended that business education graduates should undergo conferences and workshops on how to manage small scale business.

Okoro's study differs, significantly with the present study in that, it assessed the management competencies possessed by postgraduate university graduates in business education, but the present study deals with assessment of competencies required by electrical trade artisans in domestic and industrial installations. Both studies used survey research designs, Cronbach alpha in determining the coefficient of reliability, and mean and z-tests as statistical tools for answering the research questions and for testing the hypotheses of the two studies respectively. The study of Okoro (2015) assessed management competencies possessed of business education graduates to discover areas where

there are lapses, while the present study focused on competencies required by electrical trade artisans for efficient and effective performance in their vocation.

Onoh (2010) conducted a study to determine the management skills, that can be acquired through entrepreneurship education as a factor of growth for economic development of self-employed craftsmen. One research question guided the study. The study adopted descriptive survey research design and used a population of 120 craftsmen. The instrument used was the questionnaire with 40 items. Mean was used to answer the research question. Findings of the study showed that management skills were acquirable through entrepreneurship education which was identified as planning skills, organizational skills, controlling skills, directing leadership skills among others. Based on the findings, recommendations were made as follows: that self-employed craftsmen and artisans should endeavour to acquire the entrepreneurship skills and the national and state Directorates of employment should embark on effective awareness and mobilization campaign to sensitize self-employed craftsmen and artisans on the need to acquire entrepreneurship skills for self-actualization and economic development.

Onoh's study has one research question while the present study is wider in scope with five research questions and 10 null hypotheses. The study involved only craftsmen as respondents but the present study used trade artisans and supervisors as respondents. Onoh's study has similar feature with the study in the sense that the entire population were used in the two studies.

Geeta, and Tyagi (2013) conducted a study on effect of interpersonal relationship on Attitude of Teacher Educators. The objective of the study was to

identify the relationship between interpersonal skills and attitude of teachers. One research question and one null hypothesis guided the study.

Data collected were analyzed using Pearson correlation coefficient which was calculated between the behaviour and attitude data. Result obtained includes that mean value of interpersonal relation was 228.85, mean value of attitude was 240.176. Then, the correlation coefficient yielded 0.43 at 94 degree of freedom. Table value at 0.05 level of significance was 0.205. This result shows that the hypothesis was rejected.

Therefore, the study found that good interpersonal relationship impact positively on the attitude of the teacher educators. The study of Geeta and Taagi is related to the present study in that both studies were on work attitude competencies and skills required for different categories of workers. The two studies differs significantly in methods. For instance, the former study was a correlational study between interpersonal skills and teachers' attitude, while the present study used survey design, larger population and also used mean, standard deviation and z-test as statistical tools to assess the work attitude competencies required by electrical trade artisans for improved performance in their vocation.

Elobuiké (1999) conducted a study on "relevance of technical college Electrical/Electronics and Mechanical/Automobile programmes to the needs of industries". The objectives of the study are to determine the theoretical knowledge, practical skills and work attitude skills possessed by the graduates for first employment in industries. Six research questions and five (5) null hypotheses guided the study. The method used in conducting the study was survey research design. The population for the study comprised 780 persons made up of 477

technical college graduates and 303 industrial supervisors-in Anambra, Ebonyi and Enugu States of Nigeria which constituted the area of the study.

Mean statistic was used to answer the six research questions of the study, t-test was used to test hypotheses 1,2,3 and 4 while the Analysis of Variance (ANOVA) was used to test hypotheses 5 at 00.5 level of significance. The findings of the study showed among others that the technical college electrical/electronics (tech) graduates were deficient in theoretical knowledge competencies, while mechanical-automobile (tech) graduates possessed a high level of theoretical knowledge competencies. The technical college electrical/electronics (tech) graduates and their counter parts in mechanical automobile were deficient in practical competencies, while both of them possessed good work attitudes needed for first employment in industries.

Elobuiké's study is related to the present study in the sense that both studies used entire population without sampling because of the manageable size of the population. The dissimilarities of both studies are in their objectives and statistical tools used. Elobuiké's study used mean and ANOVA to analyse data collected in his study, while the present study used mean, standard deviation and z-test to analyse data collected in the study.

In another study conducted by Samuel (2011) on enhancing competencies of Electronic Craftsmen in the informal sector in Kenya. The objectives of Samuel's study was to enhance competencies of electronic craftsmen in the informal sector in Kenya through Technical, Vocational education and training (TVET). The study was guided by three research questions and three hypotheses. The method employed in the study was descriptive survey design with the

population of 120 Electronic Craftsmen offering electrical services in the informal sector. Data collected were analyzed using mean and standard deviation.

The findings of the study showed among others that the operators offering electronic services include; servicing and repairs of radios, televisions, and video machines and they proved to be aware of the contributions of TVET in their business. Samuel recommended among others that there should be an assessment on how technical/vocational education could be enhanced to ensure development of the informal sector to accelerate wealth creation of Kenya's economy and government should include entrepreneurship in technical/vocational education to help school learners who may end in the informal sector.

However, Samuel's study differs with the present study in methods, population, sample size and status of the respondents. While Samuel used mean to answer the research questions, the present study employed additional statistical tool of Z-test for testing the null hypotheses of the study.

Alio (2006) conducted a study on the strategies for enhancing the competencies of Electronic Craftsmen in the informal sector of the Economy of Enugu State. The purpose of the study was to determine the strategies for improving the theoretical, technical skills and management competencies of Electronic Craftsmen in the informal sector of the economy. The study was guided by five research questions, and five hypotheses tested at 0.05 level of significance.

The method used was survey research design. The population for the study consists of 850 electronic craftsmen in the 7 urban L.G.A. in the State. Out of the population, 426 electronic craftsmen were randomly selected and used for

the study. The instrument for data collection was questionnaire which was also used as interview guide for the illiterate respondents. Data collected were analyzed using percentage, mean and standard deviation, while analysis of variance (ANOVA), t-test and Scheff-multiple comparism tests were used to test the five hypotheses of the study.

Findings of the study among others include, that fifty-one percentage electronics craftsmen who operate in the informal sector of the economy of Enugu State received their training through apprenticeship system and that government should mount service oriented model electronics workshops in some strategic places in the urban sectors of Enugu State purposely to update the skills and knowledge of electronics craftsmen. Alio recommended among other that government should mount electronics maintenance and service oriented model workshop in strategic places in urban centers of Enugu State to update the skills and knowledge of electronics craftmen. Alio's work differs from the present study in objective, population, sample, number of hypothesis and statistical tools used for testing the null hypotheses. Alio's work is similar to the present study in the design which was survey, but differs from the present study in objective, population, sample, number of hypotheses and the statistical tools.

Okozor (2006) conducted a study on in-service training needs of building construction artisans in Enugu State. The study was to determine the theoretical knowledge, practical skills and work attitudes needed by building construction artisans in Bricklaying/block laying and concrete and those in carpentry and joinery. Five research questions and four hypotheses guided the study while the population for the study consists of 1,529 building construction artisans and

supervisors in the informal sector. There was no sampling as the entire population was used. Structured questionnaire developed by the researcher was used for data collection and there were 68 items in the questionnaire which was grouped into 5 sections A - E in accordance with the five research questions that guided the study.

The data collected, were analyzed using mean and standard deviation for the six research questions that guided the study. z-test statistics was used to test the hypotheses 1, 2, and 4 while the hypothesis three was tested using analysis of variance,(ANOVA) at 0.05 level of significance. The result of the analysis revealed that 98 percent of the theoretical knowledge and practical skills as well as work attitudes identified were accepted by the artisans and their supervisors as needed by the building construction artisans for in-service training to enhance the acquisition of relevant skills needed for improved performance in the building industry. Okozor recommended among others that state and local governments should collaborate with Industrial Training Fund (ITF) to organize improvement workshop or short in-service courses for building construction artisans to keep them abreast with relevant theoretical knowledge and practical skills needed for industrial production. Okozor's study is related to the present study in the area of the study which is Enugu State, in some statistical tools like mean, standard deviation and z-test. But both studies differ significantly in number of null hypotheses and questionnaire items. The present study is wider in scope and covers 10 null hypothesis and 91 items statements.

### **Summary of Review of Related Literature**

The study to determine the competencies required by trade artisans in

domestic and industrial electrical installations is backed up with relevant literature discussed as follows: The conceptual framework dealt with discussion and definition of some important concepts like competency, trade artisans and domestic and industrial electrical installations. These concepts are meant to acquaint the readers with the basic characteristics, knowledge and skills needed by artisans in the area of electrical installations. The conceptual framework was summarized and it revealed that competency is an inevitable quality that must be attained by any skilled worker to remain efficient and productive in the vocation.

The theoretical framework of the study provided the readers with the theoretical base upon which the study is anchored. Theories discussed in this study are the various aspects of Prosser theorems, Maslow theory and Piaget theory which were related to this study. Theoretical studies on this study revealed that most of the artisans performed their work below expectations as evidenced in their poor work attitudes and shabby output. The theoretical studies also revealed their initial training through apprenticeship system which was narrow in scope and unorganized. This makes them lack certain competencies on their graduation because they depended solely on the proficiency of their master trainers. Furthermore, it revealed that the electrical trade artisans are unfit and deficient to function effectively in this present age of high technological growth and development. This discovery justified the need to determine the theoretical knowledge and other competencies the electrical trade artisans require in order to become competent enough to face the present challenges in the industries and the society at large.

Empirical studies conducted revealed that the previous studies reviewed were shallow in content scope, and population. Then the present study, conducted

was outside the area, used larger population as well as different tools for analysis. In addition, some of the studies carried were directed on building construction industries and some on electronics craftsmen, but none was carried out to determine the competencies required by trade artisans in the area of domestic and industrial electrical installations. These constitute gaps in the body of knowledge which this study attempted to fill.

## **CHAPTER THREE**

### **METHOD**

The method and the procedures adopted to carry out this study are discussed under the following sub-headings; design of the study, area of the study, population for the study, sample and sampling techniques, the instrument for data collection, validation of the instrument, reliability of the instrument, method of data collection and method of data analysis.

#### **Design of the Study**

This study adopted survey research design. Nworgu (2015) defined survey research design as one in which a group of people or items are studied by collecting and analyzing data from only a few people or items considered to be the representative of the entire group. The survey design specifies how such data will be collected and analyzed. Findings are expected to be generalized to the entire population. Ezenwafor (2010) successfully used survey research design in her study on assessment of managerial challenges of entrepreneurs in Enugu state. In addition, Okoro (2015) used survey research design successfully in the study titled an assessment of management competencies possessed by postgraduate university business education students to handle entrepreneurship business challenges in Nigeria.

#### **Area of the Study**

The area of the study is Enugu State which is one of the states in the south-east zone of Nigeria. The State shares borders with Anambra State in the west, Benue and Kogi States in the north, Ebonyi in the east and Abia State in the south. The major occupations of the inhabitants are manufacturing, trading, civil service, farming and other casual works. Enugu state has its industrial zones located at

Emene, Awkunanaw and Nsukka. The choice of the area for the study was informed by the fact that Enugu had been the capital of the then Eastern region and still has high concentration of all categories of workers including electrical trade artisans. A good number of these artisans operate in the urban areas of the State where their services are in high demand.

### **Population for the Study**

The preliminary survey made by the researcher showed that there were 542 electrical trade artisans and 135 supervisors in the nine urban and semi urban areas of Enugu State that carry out domestic and industrial electrical installations and supervision respectively. The population of the study, therefore, is 677 (542 electrical trade artisans and 135 supervisors) as shown in Appendix A at page 106.

### **Sample and Sampling Technique**

The entire population was studied without sampling because the size is not too large for the study.

### **Instrument for Data Collection**

The instrument used for data collection is a structured questionnaire titled “Questionnaire on Competencies Required by Electrical Trade Artisans” (QCRETA). The instrument was developed by the researcher based on the research questions and insight gained from literature reviewed. It consists of two parts; Parts A and B. Part A contained two items on demographic data of the respondents while Part B has five clusters according to the research question labelled Sections A to E. Section A which was used to collect data on theoretical knowledge competencies from respondents has 12 items. Section B contains 29 items which was used to collect information on technical competencies required by trade artisans. Section C has 19 items which was used to collect information on entrepreneurial

competencies required by the artisans. Section D was used to elicit information on managerial competencies required by trade artisan for domestic and industrial electrical installations and has 17 items. Section E has 14 items, which was used to collect information on work attitude competencies required by trade artisans in domestic and industrial electrical installations in Enugu State. These items are in a five point rating scale of Very Highly Required, Highly Required, Required, Slightly Required and Not Required. Altogether the instrument contains 91 items in the five Sections.

### **Validation of the Instrument**

Content validity of the instrument was established by three experts; two of the experts are in the field of Industrial Technology Education; one from the Department of Technology and Vocational Education, Enugu State University of Science and Technology (ESUT) and the other from the Department of Vocational Education, Nnamdi Azikiwe University, Awka. The third expert is in measurement and evaluation from the Department of Science and Computer Education Enugu State University of Science and Technology. Their suggestions and corrections were taken into consideration in producing the final version of the questionnaire used for data collection for the study. For instance, one validator suggested that the topic of the study be adjusted to read Assessment of the competencies required by trade artisans for domestic and industrial installations in Enugu State. All the items in the questionnaire were retained after validation.

### **Reliability of the Instrument**

To measure the internal consistency of the instrument, 20 copies of questionnaire were administered to 20 electrical trade artisans in domestic and industrial installations and 10 electrical supervisors in Ebonyi State. Ebonyi State

was chosen because it has similar state structure as Enugu State with a high concentration of low level workers called artisans. The data collected were analyzed using Cronbach Alpha ( $\alpha$ ) because the items were polychotomously scored, (Uzoagulu, 1998). Reliability coefficient values of 0.81, 0.66, 0.84, 0.82, 0.77 were obtained for Sections A to E respectively with an overall reliability index of 0.74. This high coefficient value indicates that the instrument is reliable for the study as recommended by Radhakrishna (2007) and LoBiondo-Wood and Haber (2013) that for a research instrument to be considered reliable, a reliability coefficient of 0.70 or above is necessary. Details of the Cronbach Alpha computations are shown as Appendix E at page 116.

### **Method of Data Collection**

The researcher personally administered 677 copies of the questionnaire to the respondents with the help of five assistants who were properly guided. In the process of administering the instrument, some concepts were interpreted to the respondents especially the semi-literate ones, to enable them respond correctly to the items in the questionnaire. On the spot, completion and retrieval was adopted and those who could not respond on the first visit were visited again on appointment. This procedure facilitated a high response rate as 631 copies representing 93 percent were correctly filled and retrieved and used for analysis.

### **Method of Data Analysis**

The data collected were analyzed using mean and standard deviation to answer the research questions while z-test was used to test the null hypotheses at 0.05 level of significance. In relation to the real limits of numbers shown below the item mean was used to take decision on the items while the cluster mean was used to answer the research question.

<b>Responses</b>	<b>Numerical Units</b>	<b>Real limits</b>
Very Highly Required	5	4.50 - 5.00
Highly Required	4	3.50 - 4.49
Required	3	2.50 - 3.49
Slightly Required	2	1.50 - 2.49
Not Required	1	1.00 - 1.49

A null hypothesis was rejected where the calculated z - value is equal to or greater than the critical or table z-value at 0.05 level of significance, otherwise it was not rejected. All analysis were done using the Statistical Package for Social Sciences (SPSS) version 20.

## CHAPTER FOUR

### PRESENTATION AND ANALYSIS OF DATA

In this chapter, the data collected in the course of this study were analysed and presented in Tables in accordance with the research questions that guided the study and hypotheses that were tested at 0.05 level of significance.

#### Research Question 1

What are the theoretical knowledge competencies required by trade artisans for domestic and industrial electrical installations in Enugu State?

Data collected in respect of this research question 1 are presented in Table 1.

**Table 1**  
**Mean and Standard Deviation Ratings on Theoretical Knowledge Competencies Required by Trade Artisans for Domestic and Industrial Electrical Installations**

**n = 631**

S/N	Theoretical knowledge competencies include the ability to:	Mean	SD	Remark
1.	Identify faults easily	4.55	.75	Very Highly Required
2.	Change faulty parts	4.46	.73	Highly Required
3.	Identify tools used in electrical work	4.32	.79	Highly Required
4.	Use metres	4.29	.77	Highly Required
5.	Solve simple mathematical problems i.e. addition, subtraction, multiplication and division	4.21	.87	Highly Required
6.	Interpret electrical/electronic drawings and symbols	4.13	.95	Highly Required
7.	Interpret bills of quantities used for work	4.04	.97	Highly Required
8.	Communicate in oral English	4.05	1.17	Highly Required
9.	Read and write English language	4.24	.75	Highly Required
10.	Interpret basic scientific concepts	3.99	.96	Highly Required
11.	Select the right tools for a particular job	4.42	.75	Highly Required
12.	Use or wear safety materials	4.32	.84	Highly Required
<b>Cluster Mean</b>		<b>4.25</b>		<b>Highly Required</b>

Table 1 shows that item one has a mean score of 4.55 while the rest have mean ratings ranging from 3.99 to 4.46. The cluster mean of 4.25 shows that the respondents rated theoretical knowledge competencies as highly required by trade

artisans for domestic and industrial electrical installations. The standard deviation ratings for all the items except one are within the same range showing that the respondents were homogenous in their opinions.

## Research Question 2

What are the technical competencies required by trade artisans for domestic and industrial electrical installations in Enugu State?

Data related to research question 2 are presented in Table 2.

**Table 2**  
**Mean and Standard Deviation Ratings on Technical competencies Required by Trade Artisans for Domestic and Industrial Electrical Installations**

**n = 631**

S/N	Technical Competencies include the ability to:	Mean	SD	Remark
13.	identify and use electrical symbols of working drawing	4.49	.69	Highly Required
14.	use clip, gimlet, oil drill and plug and working materials	4.21	.82	Highly Required
15.	select types of cables PVC, MICC, armored cables of standard sizes required for particular installation	4.23	.79	Highly Required
16.	apply IEE regulation, chart cable rating, and maximum load demand	4.10	.87	Highly Required
17.	design electrical circuit drawings for installation of required points of light in series and parallel connections	4.25	.86	Highly Required
18.	select tools used for surface and conduct wiring	4.36	.82	Highly Required
19.	produce electric cable jointing such as T-joint, marred joints and britannic joints	4.29	.85	Highly Required
20.	select protective circuit breakers, and fuses for single/poly phase	4.29	.88	Highly Required
21.	install domestic electrical protective devices, fuses and switches	4.38	.78	Highly Required
22.	Install final sub-circuits: including continuity conductors to the general mass of the earth and other earthing devices	4.24	.87	Highly Required
23.	install lighting points-incandescent lamp, tungsten lamp tungsten filament lamp, gas filled tungsten filament lamp, neon tube, florescent lamp, hot and cold cathode	4.23	.86	Highly Required
24.	install surface wiring in domestic and industrial buildings.	4.37	.84	Highly Required
25.	inspect and test with required tools electrical and mechanical connections to avoid partial contact	4.31	.77	Highly Required
26.	carry a continuity test insulation test and polarity test using bell	4.17	.86	Highly Required
27.	install conduct wiring in domestic and industrial buildings.	4.23	.84	Highly Required
28.	install duct and trucking electrical wiring in series and parallel connections	4.50	.79	Very Highly Required
29.	run earth continually test on ducting and trucking	4.28	.82	Highly Required

Table 2 continued

S/N	Technical Competencies include the ability to:	Mean	SD	Remark
30.	install electrical wiring extension board for use in domestic and commercial appliances	4.33	.81	Highly Required
31.	install AC and DC motors, and generators single phase and 3 phase in (series), shunt and compound connection	4.26	.80	Highly Required
32.	to install AC and DC machines and operate polyphase machine	4.23	.87	Highly Required
33.	prepare foundation for mounting a machine	4.22	.92	Highly Required
34.	carry out test on machines to ascertain its efficiency and speed	4.11	.89	Highly Required
35.	select required tools and equipment for maintenance of AC and DC motors, generators and machines and also to locate faults in electrical installations (domestic and industrial)	4.14	.96	Highly Required
36.	Skills in following appropriate procedures in detecting or finding faulty parts in motors, generators and machines and also to locate faults in electrical installations (domestic and industrial)	4.20	.84	Highly Required
37.	rectify faults in AC and DC motors, generators and machines	4.21	.87	Highly Required
38.	Skills in the installation of domestic electrical appliances such as gold leaf circuits, cookers, heaters, and circuit alarm bells.	4.29	.80	Highly Required
39.	carry out overall maintenance in domestic and industrial installations to avoid break-down in the system	4.26	.81	Highly Required
40.	Skill to design and construct electrical machines, motors, generators and other sophisticated electrical appliances	4.13	.86	Highly Required
41.	plan design and execute star and delta single/ polyphase series and shunt connection in industrial installation	4.24	.80	Highly Required
<b>Cluster Mean</b>		<b>4.26</b>		<b>Highly Required</b>

The analysis displayed in Table 2 shows that item 28 with mean score of 4.50 is very highly required by trade artisans while the rest have mean ratings ranging from 4.10 to 4.49 as technical competencies required by trade artisans for domestic and industrial electrical installations. The cluster mean of 4.26 shows that the respondents rated technical competencies as highly required by trade artisans in domestic and industrial electrical installations. The standard deviation scores in Table 2 ranges from .69 to .88 thus indicating that the disparity in the

opinions of the respondents is slim.

### Research Question 3

What are the entrepreneurial competencies required by trade artisans for domestic and industrial electric installations in Enugu State?

Data collected to answer research question 3 are presented in Table 3.

**Table 3**  
**Mean and Standard Deviation Ratings on Entrepreneurial Competencies Required by Trade Artisans for Domestic and Industrial Electrical Installations**

**n = 631**

S/N	Entrepreneurial Competencies include the ability to:	Mean	SD	Remark
42	manage human resources in private establishment	4.39	.81	Highly Required
43	raise funds from savings, banks, co-operative societies, private individuals and philanthropists	3.99	1.00	Highly Required
44	provide effective financial reports at interval on income and expenditure to know the financial status of the business at all time.	4.00	1.00	Highly Required
45	advertise business to attract more customers	3.80	1.08	Highly Required
46	maintain good public relations	4.51	.72	Very Highly Required
47	maintain good human relations	4.38	.79	Highly Required
48	organize and run their business in order to maximize profit	4.38	.75	Highly Required
49	bargain price effectively	4.31	.84	Highly Required
50	keep records of sales correctly	4.23	.87	Highly Required
51	take inventory of goods and services from time to time	4.10	.97	Highly Required
52	determine the correct services charge on customers' equipment	4.16	.83	Highly Required
53	Skills in purchasing current tools equipment and materials	4.29	.79	Highly Required
54	Skills in recoding prices of purchased parts/components	4.26	.89	Highly Required
55	keep record of cash or cheque deposited by a customer and the remaining balance	4.34	.76	Highly Required
56	use banking facilities like being able to deposit and withdraw from the bank as need be	4.27	.90	Highly Required
57	communicate effectively and relate cordially with customers	4.20	.92	Highly Required
58	Skill in good listing habit with customer and associates	4.29	.80	Highly Required
59	Skill in risk management/risk bearing	4.22	.78	Highly Required
60	setting high standard of goods and services	4.27	.87	Highly Required
<b>Cluster Mean</b>		<b>4.23</b>		<b>Highly Required</b>

Table 3 indicates that items 46 with mean score of 4.51 is very highly required by trade artisans as entrepreneurial competencies for domestic and industrial electrical installations. The item by item analysis shows that the remaining items with mean scores ranging from 3.80 to 4.39 are highly required by trade artisans for domestic and industrial installations. The cluster mean of

4.23 shows that the respondents rated entrepreneurial competencies as highly required by trade artisans in domestic and electrical installations. The standard deviation scores showed that there is greater disparity in the opinions of the respondents regarding ability to advertise business to attract more customers, while they have slim disparity in the rest of the items as regards the entrepreneurial competencies.

#### Research Question 4

What are the managerial competencies required by trade artisans for domestic and industrial electrical installations in Enugu State?

Data collected to provide answers to research question 4 are presented in Table 4.

**Table 4**  
**Mean and Standard Deviation Ratings on Managerial Competencies Required by Trade Artisans for Domestic and Industrial Electrical Installations = 631**

S/N	Managerial Competencies ability to:	Mean	SD	Remark
61	control both human and material resources in the workshop	4.30	.84	Highly Required
62	organize and conduct effective meeting with the apprentices in the workshop	4.21	.80	Highly Required
63	Skill in using feedback from the customers	4.28	.77	Highly Required
64	repair equipment brought to the workshop before the collection date	4.24	.80	Highly Required
65	evaluate personal skills and ability of the apprentices	4.15	.86	Highly Required
66	Skill in maintaining tidy and well ventilated workshop	4.23	.84	Highly Required
67	Skill in planning ahead the activities to be carried out for a day's work	4.19	.76	Highly Required
68	inspect on regular basis tools, materials and equipment in the shop.	4.15	.82	Highly Required
69	Skills in controlling wastage of materials during electrical installations	4.50	.73	Very Highly Required
70	appraise the workers performance	4.16	.86	Highly Required
71	keep record of equipment/machines brought to the shop for repair	4.28	.84	Highly Required
72	evaluate personnel strength and weakness without being blazed	4.15	.81	Highly Required
73	Skill in sustaining long hours of work without grudges and flexibility to adapt to changes	4.13	.86	Highly Required
74	Proficiency in recording the technique by which an equipment is repaired	4.12	.98	Highly Required
75	Competency in keeping inventory of available components, tools and materials in the workshop	4.09	.94	Highly Required
76	motivate and aspire other artisans and apprentices in the workshop	4.28	.81	Highly Required
77	Skill in effective time management	4.23	.78	Highly Required
<b>Cluster mean</b>		<b>4.21</b>		<b>Highly Required</b>

Table 4 shows that item 69 has mean rating of 4.50 as very highly required by trade Artisans while the rest have mean scores ranging from 4.09 to 4.30. The cluster mean of 4.21 shows that the respondents rated managerial

competencies as highly required by trade artisans for domestic and industrial electrical installations.

The standard deviation scores of the item in Table 4 had their ratings within same range of  $SD = .73$  to  $SD = .98$  showing that the respondents are consistent in their ratings regarding managerial competencies required by electrical trade artisans for domestic and industrial electrical installations in Enugu State.

### Research Question 5

What are the work attitude competencies required by trade artisans for domestic and industrial electric installations in Enugu State?

Data collected to answer research question 5 are presented in Table 5.

**Table 5**  
**Mean and Standard Deviation Ratings on Work Attitude Competencies Required by Trade Artisans for Domestic and Industrial Electrical Installations**  
**n = 631**

S/N	Work Attitude Competences include the ability to:	Mean	SD	Remark
78	Punctuality to work always	4.60	.64	Very Highly Required
79	Ability to co-operate with customers	4.49	.74	Highly Required
80	Regularity to work	4.42	.76	Highly Required
81	Ability to co-operate and relate cordially with coworkers and supervisors	4.40	.74	Highly Required
82	Maintaining high sense of sincerity and honesty with business customers, co-workers and supervisors	4.35	.82	Highly Required
83	Willingness to accept corrections from workmates and supervisors	4.36	.88	Highly Required
84	Ability to maintain good craftsmanship	4.33	.78	Highly Required
85	Ability to avoid wastage of time and material when working	4.34	.78	Highly Required
86	Being hard-working always	4.44	.71	Highly Required
87	Starting work and completing on schedule to impress customers	4.37	.80	Highly Required
88	Acceptance of responsibilities always	4.29	.79	Highly Required
89	Ability to apply safety rules when working	4.24	.84	Highly Required
90	Being self-motivated	4.35	.82	Highly Required
91	Having great interest in the job.	4.29	.89	Highly Required
<b>Cluster Mean</b>		<b>4.37</b>		<b>Highly Required</b>

The analysis displayed in Table 5 shows that item 78 has a mean score of 4.60 as very highly required by trade artisans while the rest of the items have mean scores ranging from 4.24 to 4.49.

The cluster mean of 4.37 in Table 5 indicates that the respondents rated work attitude competencies as highly required by trade artisans in domestic and industrial electrical installations. The disparity in the standard deviation scores of items in Table 5 is slim; this shows that the respondents are consistent in their opinions as regards to the work attitude competencies required by trade artisans in domestic and industrial electrical installations in Enugu State.

### **Hypothesis 1**

There is no significant difference in the mean ratings of electrical trade artisans and their supervisors on the theoretical knowledge competencies required by electrical trade artisans for domestic and industrial electrical installations in Enugu State

**Table 6**  
**Summary of z-test Analysis on Mean Ratings of Theoretical Knowledge Competencies Required by Trade Artisans for Domestic and Industrial Electrical Installations based on status**

<b>Status of Respondents</b>	<b>N</b>	<b><math>\bar{x}</math></b>	<b>SD</b>	<b>df</b>	<b>z-cal</b>	<b>z-crit</b>	<b>Decision</b>
Artisans	503	4.24	.46	629	-1.26	1.96	Not Significant
Supervisors	128	4.30	.54				

The result in Table 6 reveals that the calculated z-value (-1.26) is less than the critical value (1.96) at alpha level of 0.05 and degree of freedom (df) 629. This is an indication that there is no significant difference in the respondents' mean ratings on the theoretical knowledge competencies required by trade artisans for domestic and industrial electrical installations as a result of status (artisans and supervisors). Therefore, the null hypothesis was not rejected.

## Hypothesis 2

There is no significant difference in the mean ratings of experienced and inexperienced trade artisans on the theoretical knowledge competencies they require for domestic and industrial electrical installations in Enugu state.

To test hypothesis 2, data collected were analysed using z-test statistical tool.

The results are presented in Table 7.

**Table 7**

**Summary of z-test Analysis of Experienced and Inexperienced Trade Artisans' Mean Ratings on Theoretical Knowledge Competencies they Require for domestic and industrial electrical installations.**

<b>Electrical Trade Artisans</b>	<b>N</b>	<b><math>\bar{x}</math></b>	<b>SD</b>	<b>df</b>	<b>z-cal</b>	<b>z-crit</b>	<b>Decision</b>
Experienced	178	4.38	.45	501	-4.51	1.96	Not Significant
Inexperienced	325	4.19	.47				

The result in Table 7 shows that the calculated z-value (-4.51) is less than the critical value (1.96) at alpha level of 0.05 and degree of freedom (df) 501. This is an indication that there is no significant difference in the mean ratings of experienced and inexperienced trade artisans on the theoretical knowledge competencies they require for domestic and industrial electrical installations. Therefore, the null hypothesis was not rejected.

## Hypothesis 3

A significant difference does not exist in the mean ratings of trade artisans and their supervisors on the technical competencies required by electrical trade artisans for domestic and industrial installations in Enugu state.

To test hypothesis 3, data collected were analysed using z-test statistical.

The results are presented Table 8.

**Table 8**  
**Summary of z-test Analysis on Mean Ratings on Technical Competencies Required by Trade Artisans in Domestic and Industrial Electrical Installations**

Status of Respondents	N	$\bar{x}$	SD	df	z-cal	z-crit	Decision
Artisans	503	4.39	.51	629	-1.95	1.96	Not Significant
Supervisors	128	4.49	.57				

The result in Table 8 reveals that the calculated z-value (-1.95) is less than the critical value (1.96) at alpha level of 0.05 and degree of freedom (df) 629. This shows that there is no significant difference in the respondents' mean ratings on the technical competencies required by trade artisans for domestic and industrial electrical installations as a result of status (artisans and supervisors). Therefore, the null hypothesis was not rejected.

#### **Hypothesis 4**

There is no significant difference in the mean ratings of experienced and inexperienced trade artisans on the technical competencies they require for domestic and industrial electrical installation in Enugu state. To test hypothesis 4, data collected were analysed using z-test statistical tool and the result are presented in Table 9.

**Table 9**  
**Summary of z-test Analysis of Experienced and Inexperienced Respondents' Mean Ratings on Technical Competencies they Require for Domestic and Industrial Electrical Installations**

Electrical Trade	N	$\bar{x}$	SD	df	z-cal	z-crit	Decision
Artisans							
Experienced	178	4.48	.54	501	2.29	1.96	Significant
Inexperienced	325	4.38	.52				

Table 9 shows that the calculated z-value (2.29) is greater than the critical value (1.96) at alpha level of 0.05 and degree of freedom (df) 501. This is an

indication that there is significant difference in the mean ratings of experienced and inexperienced trade artisans on the technical competencies they require for domestic and industrial electrical installations. Therefore, the null hypothesis was rejected.

### **Hypothesis 5**

There is no significant difference in the mean ratings of trade artisans and their supervisors on the entrepreneurial competencies required by artisans in domestic and industrial electrical installations in Enugu state. To test hypothesis 5, data collected were analysed utilizing z-test statistical analysis and the results are presented in Table 10.

**Table 10**  
**Summary of z-test Analysis on Mean Ratings on Entrepreneurial Competencies Required by Trade Artisans for Domestic and Industrial Electrical Installations**

<b>Status of Respondents</b>	<b>N</b>	<b><math>\bar{x}</math></b>	<b>SD</b>	<b>df</b>	<b>z-cal</b>	<b>z-crit</b>	<b>Decision</b>
<b>Artisans</b>	503	4.21	.49	629	-2.02	1.96	Not Significant
<b>Supervisors</b>	128	4.31	.55				

Table 10 shows that the calculated z-value (-2.02) is less than the critical value (1.96) at alpha level of 0.05 and degree of freedom (df) 629. This is an indication that there is no significant difference in the respondents' mean ratings on the entrepreneurial competencies required by trade artisans for domestic and industrial electrical installations as a result of status (artisans and supervisors). Therefore, the null hypothesis was not rejected

### **Hypothesis 6**

There is no significant difference in the mean ratings of experienced and inexperienced trade artisans on the entrepreneurial competencies they require for domestic and industrial electrical installation in Enugu state. To test hypothesis

6, data collected were analysed using z-test statistical tool. The results are presented Table 11.

**Table 11**  
**Summary of z-test Analysis of Experienced and Inexperienced Trade Artisans' Mean Ratings on Entrepreneurial Competencies they Require for Domestic and Industrial Electrical Installations**

<b>Electrical Trade Artisans</b>							
	<b>N</b>	$\bar{x}$	<b>SD</b>	<b>df</b>	<b>z-cal</b>	<b>z-crit</b>	<b>Decision</b>
<b>Experienced</b>	178	4.29	.51	501	- 2.07	1.96	Not Significant
<b>Inexperienced</b>	325	4.20	.50				

The summary of z-test analysis in Table 11 shows that the calculated z-value (-2.07) is less than the critical value (1.96) at alpha level of 0.05 and degree of freedom (df) 501. This shows that there is no significant difference in the mean ratings of experienced and inexperienced trade artisans on the entrepreneurial competencies they require for domestic and industrial electrical installation. Therefore, the null hypothesis was not rejected.

### **Hypothesis 7**

There is no significant difference in the mean ratings of trade artisans and their supervisors on the managerial competencies required by trade artisans for domestic and industrial installation in Enugu state. To test hypothesis, data collected were analysed using z-test statistical tool and the results are presented in Table 12.

**Table 12**  
**Summary of z-test Analysis on Mean Ratings on Managerial Competencies Required by Trade Artisans for Domestic and Industrial Electrical Installations**

<b>Status of Respondents</b>							
	<b>N</b>	$\bar{x}$	<b>SD</b>	<b>df</b>	<b>z-cal</b>	<b>z-crit</b>	<b>Decision</b>
<b>Artisans</b>	503	4.18	.49	629	-3.36	1.96	Not Significant
<b>Supervisors</b>	128	4.35	.52				

The summary of z-test analysis in Table 12 shows that the calculated z-value (-3.36) is less than the critical value (1.96) at alpha level of 0.05 and degree of freedom (df) 629. This indicates that there is no significant difference in the respondents' mean ratings the respondent on the managerial competencies required by trade artisans for domestic and industrial electrical installation as a result of status (artisans and supervisors). Therefore, the null hypothesis was not rejected.

### Hypothesis 8

There is no significant difference in the mean ratings of experienced and inexperienced trade artisans on the managerial competencies they require for domestic and industrial electrical installation in Enugu state. To test hypothesis 8, data collected were analysed using z-test statistical tool, and the results are presented in Table 13.

**Table 13**  
**Summary of z-test Analysis of Experienced and Inexperienced Trade Artisans' Mean Ratings on Managerial Competencies they require for Domestic and Industrial Electrical Installations**

<b>Electrical Trade Artisans</b>							
	<b>N</b>	$\bar{x}$	<b>SD</b>	<b>df</b>	<b>z-cal</b>	<b>z-crit</b>	<b>Decision</b>
<b>Experienced</b>	178	4.27	.52	501	- 1.86	1.96	Not Significant
<b>Inexperienced</b>	325	4.19	.49				

The summary of z-test analysis displayed in Table 13 shows that the calculated z-value (-1.86) is less than the critical value (1.96) at alpha level of 0.05 and degree of freedom (df) 501. This shows that there is no significant difference in the mean ratings of experienced and inexperienced trade artisans on the managerial competencies they require for domestic and industrial electrical installations. Therefore, the null hypothesis was not rejected.

### Hypothesis 9

There is no significant difference in the mean ratings of trade artisans and their supervisors on the work attitude competencies required by artisans for domestic and industrial electrical installation in Enugu state. To test hypothesis 9, data collected were utilizing z-test statistical tool. The results are presented in Table 14.

**Table 14**  
**Summary of z-test Analysis on Mean Ratings on Work Attitude Competencies Required by Trade Artisans for Domestic and Industrial Electrical Installations**

Status of Respondents	N	$\bar{x}$	SD	df	z-cal	z-crit	Decision
Artisans	503	4.36	.50	629	-0.80	1.96	Not Significant
Supervisors	128	4.40	.47				

The summary of z-test analysis in Table 14 shows that the calculated z-value of -0.80 is less than the critical value (1.96) at alpha level of 0.05 and degree of freedom (df) 629. This shows that there is no significant difference in the respondents mean ratings on the work attitude competencies required by trade artisans for domestic and industrial electrical installations as a result of status (artisans and supervisors). Therefore, the null hypothesis was not rejected.

### Hypothesis 10

There is no significant difference in the mean ratings of experienced and inexperienced trade artisans on work attitude competencies they require for domestic and industrial electrical installations in Enugu state. To test hypothesis 10, data collected were analysed using z-test statistical tool and the results are presented in Table 15.

**Table 15**  
**Summary of z-test Analysis of Experienced and Inexperienced Trade Artisans' Mean Ratings on Work Attitude Competencies they Require for Domestic and Industrial Electrical Installations**

<b>Electrical Trade Artisans</b>	<b>N</b>	<b><math>\bar{x}</math></b>	<b>SD</b>	<b>df</b>	<b>z-cal</b>	<b>z-crit</b>	<b>Decision</b>
<b>Experienced</b>	178	4.23	.55	501	1.71	1.96	Not Significant
<b>Inexperienced</b>	325	4.39	.47				

The summary of z-test analysis in Table 15 shows that the calculated z-value of 1.71 is less than the critical value (1.96) at alpha level of 0.05 and degree of freedom (df) 501. This shows that there is no significance difference in the mean ratings of experienced and inexperienced trade artisans on the work attitude competencies they require for domestic and industrial electrical installations. Therefore, the null hypothesis was not rejected.

### **Summary of Findings**

Findings of this study are summarized as follows:

1. Theoretical knowledge competencies for domestic and industrial electrical installations are highly required by trade artisans in Enugu State.
2. Technical competencies for domestic and industrial electrical installations are highly required by trade artisans in Enugu State.
3. Entrepreneurial competencies for domestic and industrial electrical installations are highly required by trade artisans in Enugu State.
4. Managerial competencies in domestic and industrial electrical installations are highly required by trade artisans in Enugu State.
5. Electrical trade artisans and supervisors agreed that work attitude competencies in domestic and industrial electrical installations as highly required by trade artisans in Enugu State.

6. Supervisors and artisans did not differ significantly in their mean ratings on theoretical knowledge, technical, entrepreneurial, managerial and work attitude competencies required by trade artisans in domestic and industrial electrical installations in Enugu State.
- 7 Experienced and inexperienced respondents did not differ significantly in their mean ratings on theoretical knowledge, entrepreneurial, managerial and work attitude competencies, required by trade artisans in domestic and electrical installations in Enugu State but differed significantly in their mean rating on technical competencies.

## CHAPTER FIVE

### DISCUSSION, CONCLUSION AND RECOMMENDATIONS

In this chapter, the discussion of results, conclusion and recommendations are presented.

#### **Discussion of Results**

The findings of this study are discussed in this section under suitable sub-headings in line with the research questions, and hypotheses as follows:

#### **Theoretical Knowledge Competencies required by Trade Artisans**

The result of the study showed that all the theoretical competencies listed in table one are highly required by electrical trade artisans to function effectively in domestic and industrial electrical installations. This indicates that electrical trade artisans must possess theoretical knowledge competencies in order to effectively carry out their duties in electrical installation works. This findings agreed with one of the theories under pinning this study which was the theory of intellectual development propounded by Jean Piaget. This theory according to Onyeghalu (2005) stated

- i. That learning is an interactive process achieved through interaction between the learner and the physical world or environment;
- ii. That cognition is a gradual and developmental process,
- iii. That cognitive achievement is influenced by several factors such as organic maturation, past experience, genetic inheritance and the quality of environment.
- iv. That intelligence or adaptive behaviour is essentially an interplay between two important psychological variables which are identified as assimilation and accommodation.

The emphasis of this theory is that cognition and intellectual development are vital qualities that will enable artisans to function efficiently and effectively in their vocation. The findings are in consonance with the opinion made by Becker and Mincer in Babalola (2003), that theoretical knowledge is specialized knowledge used to execute specific machine operations, safety guards, and to develop the whole person psychologically, physically, mentally, socially, and occupationally. It is also in support of Elobike (2006) who posited that theoretical knowledge guides the practical aspect of getting a job/work done and is a pre-requisite for success in acquiring practical skills and becoming competent in vocation. However, the result of Table 6 shows that the supervisors and the artisans do not differ significantly in their mean rating on theoretical knowledge competencies required by electrical trade artisans. This means that both respondents consented that electrical trade artisans highly require theoretical knowledge competences. This finding agrees with that of Giachino and Gillington in Uzoagulu (2012) who posited that any vocational technical graduates irrespective of level should be able to apply some principles and theories of the trade or occupation for solution of problems associated to the area of the practice.

On the other hand, experienced and inexperienced artisans do not differ significantly in their mean ratings on theoretical knowledge competencies. This is not surprising because theoretical knowledge competencies that are acquired through general education are vital in overall performance of artisans. This is in line with Elobuiké (2006) who posited that general education is needed by all persons, children, youths and adults who aimed at developing knowledge, skills, aptitude, abilities and behaviours considered desirable by society, but not necessarily preparing them for specific types of occupations or professions. The

finding is also in agreement with Odigbo (2004) who stated that the thrust of education is to produce a generation of committed, conscientious, creative, resourceful and all round individuals who would be functional in today's society.

### **Technical competencies required by Trade Artisans**

The findings of the study showed that technical competencies are highly required by the electrical trade artisans. This result agrees with Samuel (2011) who posited that artisans will be effective only if they possess skills and competencies to achieve some of the TVET objectives of wealth creation. The respondents did not differ significantly in their mean ratings on technical competencies required by trade artisans for domestic and industrial electrical installations. This means that technical competencies are highly required by trade artisans for domestic and industrial electrical installations as the determinants of their success in employment and the technology upliftment of the nation. Furthermore, the findings of the study reveals that experienced and inexperienced trade artisans differ significantly in their mean ratings on the technical competencies required to enhance their performance. This finding is in line with Obayi, Obi and Okafor (2012) who posited that workers are not born with capabilities but their potentials can be developed by appropriate training and experience.

### **Entrepreneurial Competencies required by Trade Artisans**

The findings of the study showed that trade artisans in domestic and industrial electrical installations in Enugu State require entrepreneurial competencies. The findings further showed that the respondents did not differ significantly in their mean rating on entrepreneurial competencies required by electrical trade artisans for effective performance as a result of status and

experiences. This indicates that the citizens have come to realize the importance of entrepreneurship education towards economic emancipation/upliftment of the youth and adults through self employment embedded in the programme. This finding agrees with Alaezi (2009) and, Eze and Okoroafor (2012) who suggested that drastic measures should be taken by way of curriculum tinkering, inclusion and exclusion in favour of entrepreneurship education. Alaezi maintained, that no country can move forward technologically, industrially and economically without strongly developing the culture of poverty reduction, wealth creation and employment generation. Alaezi (2009) highlighted entrepreneurial competencies to include, managerial, administrative, innovative, enterprising, communication, investigative problem solving and other special skills contained in entrepreneurship education.

The findings are also in support of Akintola (2001) who posited that entrepreneurship is a veritable employment alternative tool to create wage employment and as a panacea to graduate unemployment. The findings also supported Ikeme (2007) who posited that through well planned and executed entrepreneurship education, Nigerian youths will learn to be happy and fulfilled persons. Ikeme maintained that through entrepreneurship education, national and global goals would be achieved rather than the youths abandoning their countries for the so-called greener pastures overseas.

### **Managerial Competencies Required by Trade Artisans**

The study revealed that trade artisans in domestic and industrial electrical installations in Enugu State highly required managerial competencies. This findings supported the findings made by Nwokike (2014) that one of the major causes of small business failures in Nigeria has been lack of managerial skills by the

owners and operators. This finding agrees with Alio (2006) who opined that managerial functions that will ensure success for craftsmen include effective management of materials, time, records and equipment. This shows that managerial competencies are prerequisites for effective starting and running business enterprises. This finding is in agreement with Elobuike in Alio (2006) who posited that to succeed in any business activity, an entrepreneurs or business manager requires good background of the crafts and adequate managerial competencies.

The study further revealed that status and experience of the respondents did not significantly influence their mean rating on managerial competencies required by trade artisans in domestic and industrial electrical installations in Enugu State. This could be attributed to peoples' wide recognition of the essence of managerial competencies for all individuals irrespective of nature of their work.

### **Work Attitude Competencies required by Trade Artisans**

The findings of the study showed that trade artisans in domestic and electrical installations in Enugu State highly require work attitude competencies to be successful. This result agrees with Olaitan (2006) who opined that vocational preparation is necessary ingredients for development of attitudes and knowledge for optimal job performance.

Training of artisans in knowledge and skills, without work attitude competencies will not be a complete training. This is because Uzoagulu (2002) stated that training of artisans in theoretical knowledge and practical skills without blending it with right attitude to work will not lead the artisans any where. To buttress the point Uzoagulu affirmed that the level of production of firm or an industry can be lowered or increased depending on the attitude of its workers to

their work. Okozor (2006) reported that well trained workers find their work more interesting, derive more pleasure and more job satisfaction from their work, suffer less boredom and tension, are healthier, use their expert knowledge, technical skills as well as good work attitude to establish and advance their business.

Ezeji (2006) enumerated some of the good work attitudes required by workers to include, punctuality to work, good personal appearance and neatness, care of tools, machines, equipment and materials, initiative and good work judgment among others. Work attitude competencies are necessary tool to be incorporated in the training for skilled occupation. Olaitan (2006) stated that vocational and pre-vocational preparations consider the acquisition of skills, development of attitudes, and knowledge which enable young people to play their part in the working community by helping them to work more effectively.

The findings further showed that the respondents did not differ significantly in their mean ratings on work attitude competences required by trade artisans in domestic and industrial electrical installations based on status and experience. This may be attributed to the full realization of the importance of work attitude towards achieving the objectives of a company or business organization.

### **Conclusion**

From the findings of this study, it was concluded that for trade artisan in domestic and industrial electrical installations in Enugu State to satisfy their customers and be successful in their vocation, they highly require theoretical knowledge, technical, entrepreneurial, managerial and work attitude competencies.

### **Implications of the Study**

From the findings of this study, it was established that electrical trade artisans highly require theoretical knowledge, technical, entrepreneurial,

managerial and work attitude competencies to succeed in their vocation. This shows that the incompetency among electrical trade artisans was not caused by a single factor but diverse factors. The implication of these findings is that if trade artisans in domestic and industrial electrical installation in Enugu State are equipped with these competencies, they will be more effective and successful in their vocation. This implies that there is need to in-cooperate the identified competencies in the training and retraining of electrical trade artisans to achieve a high degree of effectiveness among them. The findings of this study also imply the need for broadening the curriculum of electrical installation trades at the technical college level by incorporating the competencies identified for enhanced performance of the products.

### **Recommendations**

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

1. Electrical trade artisans should avail themselves of the wonderful opportunities given by National Directorate of Employment (NDE) to upgrade themselves by achieving competencies in their vocation and acquiring certificate.
2. Master craftsmen or the supervisors should attend workshops/seminars regularly to keep abreast with the current happenings or changes in technological development in order to adequately prepare their apprentices for effective performance.
3. Curriculum planners should widen the contents of training and retraining of technical workers to incooperate modern skills and competencies in their respective trade areas.

4. Governments should create adequate awareness about the skills offered by the National Directorate of Employment (NDE) for graduates and non-graduates to avail themselves the opportunity to upgrade their skills in their fields.
5. Government at all levels should encourage artisans in the public and private sectors to upgrade themselves by undertaking in-service training to obtain certificates.

### **Suggestion for Further Studies**

The following areas are suggested for further studies :

1. This study should be replicated using mechanical trade instead of electrical trade.
2. The study should also be replicated in other states using electrical trade artisans and their supervisors for comparison.
3. A follow-up study should be conducted on strategies for improving the competencies of electrical trade artisans for domestic and industrial electrical installations in Enugu State.

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## APPENDIX A

### Population distribution by local government and status

S/N	Local Government Areas	Electrical Trade Artisans	Supervisors
1	Enugu East	119	14
2	Enugu North	103	23
3	Enugu South	130	37
4	Awgu	29	14
5	Udi	47	17
6	Oji River	32	13
7	Udenu	22	05
8	Nsukka	39	07
9	Nkanu West	21	05
	<b>Total</b>	<b>542</b>	<b>135</b>

**Source:** Local Government Headquarters (2015) in conjunction with the List of Registered Members of Electrical Trade Artisans in “NATAWU” Enugu State Chapter.

**APPENDIX B**

Department of Technology and Vocational Education  
Nnamdi Azikiwe University  
Awka

13<sup>th</sup> May, 2015

Sir/Madam,

**REQUEST FOR VALIDATION OF RESEARCH INSTRUMENT  
TITLED – DETERMINATION OF COMPETENCIES  
REQUIRED BY TRADE ARTISANS FOR DOMESTIC AND  
INDUSTRIAL ELECTRICAL INSTALLATIONS IN ENUGU  
STATE**

I am a Postgraduate student of the above department and university, and I am conducting a research on the topic stated above. Please kindly assist me to validate the attached instrument in terms of content coverage, clarity, appropriateness of the language, expression and instructions to the respondents.

Thanks.

Yours sincerely,

**Oluka Sussan .N.**  
*(Researcher)*

**APPENDIX C****LETTER OF TRANSMITTAL**

Department of Technology and Vocational Education  
Nnamdi Azikiwe University  
Awka

13th May, 2015

Dear Respondent,

**QUESTIONNAIRE ON DETERMINATION OF  
COMPETENCIES REQUIRED BY TRADE ARTISANS FOR  
DOMESTIC AND INDUSTRIAL ELECTRICAL  
INSTALLATIONS IN ENUGU STATE**

I am a Ph.D student of the above Institution conducting a research study on the above topic, in Enugu State. Please, you are requested to respond to the attached questionnaire by ticking good (%) in the spaces provided against the response options that best appeal to you or describe your opinion.

The information sought is to be used only for the purposes of this study and therefore will be treated confidentially.

Yours faithfully,

**Oluka Sussan .N.**  
*Researcher*

## APPENDIX D

### ITEMS

#### PART 1 PERSONAL DATA

Please tick [%] as appropriate in the boxes below

1. Status of respondent
  - a) Artisan
  - b) Supervisor
  
2. Years of experience of electrical trade artisan
  - a) 0 - 5 years
  - b) 6 - 10 years
  - c) 11 years and above

#### PART 2

#### INSTRUMENT FOR DATA COLLECTION ON DETERMINATION OF COMPETENCIES REQUIRED BY TRADE ARTISANS FOR DOMESTIC AND INDUSTRIAL ELECTRICAL INSTALLATIONS IN ENUGU STATE

##### INSTRUCTION

Listed below are competencies required by Electrical Trade Artisans in domestic and industrial electrical installations. Kindly read the statements and respond with a tick [%] in the columns that best described your opinion.

A five-point response scales and weighing are applied to each item in Section A to E on the assessment of competencies required by electrical artisans in domestic and industrial electrical installations.

<b>Very Highly Required</b>	<b>(VHR)</b>	-	<b>5</b>
<b>Highly Required</b>	<b>(HR)</b>	-	<b>4</b>
<b>Required</b>	<b>(R)</b>	-	<b>3</b>
<b>Slightly Required</b>	<b>(SR)</b>	-	<b>2</b>
<b>Not Required</b>	<b>(NR)</b>	-	<b>1</b>

**SECTION A:**  
**Extent to which Theoretical Knowledge competencies are  
 required by electrical trade artisans.**

S/N	Theoretical Knowledge Competencies	VHR	HR	R	SR	NR
1	Ability to identify faults easily					
2	Ability to change faulty parts					
3	Ability to identify tools used in electrical work					
4	Ability to use metres					
5	Ability to solve simple mathematical problems i.e. addition, subtraction, multiplication and division					
6	Ability to interpret electrical/electronic drawings and symbols					
7	Ability to interpret bills of quantities used for work					
8	Ability to communicate in oral English					
9	Ability to read and write English language					
10	Ability to interpret basic scientific concepts					
11	Ability to select the right tools for a particular job.					
12	Ability to use or wear safety materials.					

**SECTION B****Extent to which technical competencies are required by electrical trade artisans for domestic and industrial electrical installations**

	<b>Domestic Installation competencies</b>	<b>VHR</b>	<b>HR</b>	<b>R</b>	<b>SR</b>	<b>NR</b>
13	Ability to identify and use electrical symbols of working drawing.					
14	Ability to use clip, gimlet, oil drill and plug and working materials					
15	Ability to select types of cables PVC, MICC, Armoured cables of standard sizes required for particular installation					
16	Ability to apply IEE regulation, chart cable rating, and maximum load demand.					
17	Ability to design electrical circuit drawings for installation of required points of light in series and parallel connections.					
18	Ability to select tools used for surface and conduct wiring					
19	Ability to produce electric cable jointing such as T-joint, marred joints and britannic joints.					
20	Ability to select protective circuit breakers, and fuses for single/poly phase.					
21	Ability to install domestic electrical protective devices, fuses and switches.					
22	Install final sub-circuits: including continuity conductors to the general mass of the earth and other earthing devices.					
23	Ability to install lighting points - incandescent lamp, tungsten filament lamp, gas filled tungsten filament lamp, neon tube, florescent lamp, hot and cold cathode.					
24	Ability to install surface wiring - in domestic and industrial building					
25	Ability to inspect and test with required tools electrical and mechanical connections to avoid partial contact.					
26	Ability to carry a continuity test insulation test and polarity test using bell					
27	Ability to install conduct wiring in domestic and industrial buildings					

	<b>Industrial Installation Competencies</b>					
28	Ability to install duct and trucking electrical wiring in series and parallel connections					
29	Ability to run earth continually test on ducting and trucking					
30	Ability to install electrical wiring extension board for use in domestic and commercial appliances					
31	Ability to install AC and DC motors, and generators single phase and 3 phase in (series), shunt and compound connection.					
32	Ability to install AC and DC machines and operate polyphase machine					
33	Ability to prepare foundation for mounting a machine					
34	Ability to carry out test on machines to ascertain its efficiency and speed.					
35	Ability to select required tools and equipment for maintenance of Ac and DC motors, generators and machines					
36	Skills in following appropriate procedures in detecting or finding faulty parts in motors, generators and machines and also to locate faults in electrical installations (domestic and industrial)					
37	Ability to rectify faults in AC and DC motors, generators and machines.					
38	Skills in the installation of domestic electrical appliances such as gold leaf circuits, cookers, heaters, and circuit alarm bells.					
39	Ability to carryout overall maintenance in domestic and industrial installations to avoid break-down in the system					
40	Skills to design and construct electrical machines, motors, generators and other sophisticated electrical appliances.					
41	Ability to plan, design and execute star and delta single/polyphase series and shunt connection in industrial installation					

**SECTION C**  
**Extent to which Entrepreneurial Competencies are**  
**required by Electrical Trade Artisans**

	<b>Entrepreneurial competencies</b>	<b>VHR</b>	<b>HR</b>	<b>R</b>	<b>SR</b>	<b>NR</b>
42	Ability to manage human resources in private establishment					
43	Ability to raise funds from savings, banks, co-operative societies, private individuals and philanthropists					
44	Ability to provide effective financial reports at interval on income and expenditure to know the financial status of the business at all time					
45	Ability to advertise business to attract more customers					
46	Ability to maintain good public relations					
47	Ability to maintain good human relations					
48	Ability to organize and run their business in order to maximize profit					
49	Ability to bargain price effectively					
50	Ability to keep records of sales correctly					
51	Ability to take inventory of goods and services from time to time.					
52	Ability to determine the correct service charge on customers' equipment					
53	Skills in purchasing current tools equipment and materials					
54	Skills in recording prices of purchased parts/components					
55	Ability to keep record of cash or cheque deposited by a customer and the remaining balance					
56	Ability to use banking facilities like being able to deposit and withdraw from the bank as need be.					
57	Ability to communicate effectively and relate cordially with customers.					
58	Skill in good listing habit with customer and associates.					
59	Skill in risk management/risk bearing					
60	Ability in setting high standard of goods and services.					

**SECTION D**  
**Extent to which Managerial Competencies are required by**  
**Electrical Trade Artisans**

	Managerial competencies	VHR	HR	R	SR	NR
61	Ability to control both human and material resources in the workshop.					
62	Ability to organize and conduct effective meeting with the apprentices in the workshop					
63	Skill in using feedback from the customers					
64	Ability to repair equipment brought to the workshop before the collection date.					
65	Ability to evaluate personal skills and abilities of the apprentices					
66	Skill in maintaining tidy and well ventilated workshop					
67	Skill in planning ahead the activities to be carried out for a day's work					
68	Ability to inspect on regular basis tools, materials and equipment in the shop					
69	Skills in controlling wastage of materials during electrical installations.					
70	Ability to appraise the workers performance					
71	Ability to keep record of equipment/mechanics brought to the shop for repair.					
72	Ability to evaluate personnel strength and weakness without being blazed					
73	Skill in sustaining long hours of work without grudges and flexibility to adapt to changes.					
74	Proficiency in recording the technique by which an equipment is repaired					
75	Competency in keeping inventory of available components, tools and materials in the workshop.					
76	Ability to motivate and aspire other artisans and apprentices in the workshop.					
77	Skill in effective time management					

**SECTION E**  
**Extent to which Work attitude skills are required by**  
**Electrical trade artisans**

	Work attitude skills	VHR	HR	R	SR	NR
78	Punctuality to work always					
79	Ability to co-operate with customers					
80	Regularity to work					
81	Ability to cooperate and relate cordially with co-workers and supervisors					
82	Maintaining high sense of sincerity and honesty with business customers, co-workers and supervisors					
83	Willingness to accept corrections from workmates and supervisors					
84	Ability to maintain good craftsmanship					
85	Ability to avoid wastage of time and material when working					
86	Being hard-working always					
87	Starting work and completing on schedule to impress customers					
88	Acceptance of responsibilities always					
89	Ability to apply safety rules when working					
90	Being self-motivated					
91	Having great interest in the job.					

## APPENDIX E

### RELIABILITY ESTIMATE OF THE INSTRUMENT USING CRONBACH ALPHA (CLUSTER BY CLUSTER)

SECTION A:

n = 30

ITEM	VHR (5)	HR (4)	R (3)	SR (2)	NR (1)	Vi
1	27	3	-	-	-	0.09
2	21	9	-	-	-	0.22
3	24	6	-	-	-	0.17
4	18	9	3	-	-	0.47
5	2	15	9	3	-	0.66
6	18	9	3	-	-	0.47
7	6	18	6	-	-	0.41
8	6	6	9	3	6	1.96
9	6	15	6	3	-	0.79
10	3	15	9	3	-	0.66
11	21	9	-	-	-	0.22
12	21	6	3	-	-	0.46

 $\Sigma vi = 6.58$ 

$$\text{Cronbach Alpha } (\alpha) = \frac{K}{K-1} \left( 1 - \frac{\Sigma vi}{vt} \right)$$

where

$$\begin{aligned} k &= \text{no of items} \\ &= 12 \\ \Sigma vi &= \text{sum of item variances} \\ &= 6.58 \\ vt &= \text{Total variance} \\ &= 25.62 \end{aligned}$$

Substituting, we have that

$$\begin{aligned} \alpha &= \frac{12}{11} \left( 1 - \frac{6.58}{25.62} \right) \\ &= 1.09 (1 - 0.257) \\ &= 1.09 \times 0.743 \\ &= 0.80987 \\ &\approx 0.81 \end{aligned}$$

## SECTION B:

n = 30

ITEM	VHR (5)	HR (4)	R (3)	SR (2)	NR (1)	Vi
13	12	15	3	-	-	0.42
14	9	15	6	-	-	0.51
15	18	9	3	-	-	0.47
16	9	9	12	-	-	0.71
17	6	15	6	3	-	0.79
18	15	6	9	-	-	0.79
19	3	18	3	6	-	0.87
20	15	6	9	-	-	0.79
21	21	6	3	-	-	0.46
22	15	6	9	-	-	0.79
23	15	6	9	-	-	0.79
24	15	9	3	3	-	0.99
25	18	12	-	-	-	0.25
26	9	21	-	-	-	0.22
27	18	6	3	-	-	1.04
28	15	9	6	-	-	0.63
29	9	9	12	-	-	0.71
30	12	13	5	-	-	0.53
31	6	15	9	-	-	0.51
32	10	14	3	3	-	0.86
33	9	-	15	3	3	1.67
34	3	15	6	3	3	1.28
35	8	15	4	3	-	0.82
36	9	18	-	3	-	0.71
37	9	9	9	-	3	1.46
38	9	12	6	3	-	0.92
39	21	9	-	-	-	0.22
40	6	-	9	9	6	1.87
41	-	12	15	3	-	0.42

 $\Sigma vi = 22.50$

$$\text{Cronbach Alpha } (\alpha) = \frac{K}{K-1} \left( 1 - \frac{\sum v_i}{vt} \right)$$

where

$$\begin{aligned} k &= 29 \\ \sum v_i &= 22.50 \\ vt &= 61.58 \\ &= 25.62 \end{aligned}$$

Substituting, we have that

$$\begin{aligned} \alpha &= \frac{29}{28} \left( 1 - \frac{22.50}{61.58} \right) \\ &= 1.04 (1 - 0.365) \\ &= 1.04 \times 0.635 = 0.6604 \approx 0.66 \end{aligned}$$

## SECTION C:

n = 30

ITEM	VHR (5)	HR (4)	R (3)	SR (2)	NR (1)	Vi
42	15	3	12	-	-	0.92
43	7	12	11	-	-	0.60
44	8	13	9	-	-	0.59
45	18	7	5	-	-	0.60
46	20	10	-	-	-	0.23
47	18	12	-	-	-	0.25
48	15	12	3	-	-	0.46
49	18	9	3	-	-	0.47
50	18	6	3	3	-	1.04
51	12	13	5	-	-	0.53
52	17	11	2	-	-	0.40
53	23	6	1	-	-	0.27
54	16	10	4	-	-	0.52
55	17	10	3	-	-	0.46
56	9	15	6	-	-	0.51
57	24	3	3	-	-	0.42
58	12	15	3	-	-	0.42
59	9	12	6	3	-	0.92
60	12	15	3	-	-	0.42

 $\Sigma vi = 10.03$ 

$$\text{Cronbach Alpha } (\alpha) = \frac{K}{K-1} \left( 1 - \frac{\Sigma vi}{vt} \right)$$

where

$$\begin{aligned} k &= 19 \\ \Sigma vi &= 10.3 \\ vt &= 48.33 \end{aligned}$$

Substituting, we have that

$$\begin{aligned} \alpha &= \frac{19}{18} \left( 1 - \frac{10.03}{48.33} \right) \\ &= 1.06 (1 - 0.208) \\ &= 1.06 \times 0.792 \\ &= 0.83952 \\ &\approx 0.84 \end{aligned}$$

SECTION D:

n = 30

ITEM	VHR (5)	HR (4)	R (3)	SR (2)	NR (1)	Vi
61	18	9	3	-	-	0.47
62	15	9	6	-	-	0.63
63	15	13	2	-	-	0.39
64	21	6	3	-	-	0.46
65	18	3	6	3	-	1.20
66	12	18	-	-	-	0.25
67	17	13	-	-	-	0.25
68	27	3	-	-	-	0.09
69	21	9	-	-	-	0.22
70	12	15	3	-	-	0.42
71	18	6	6	-	-	0.66
72	19	9	1	1	-	0.53
73	9	6	15	-	-	0.79
74	12	10	3	-	-	0.46
75	13	8	7	2	-	0.96
76	9	18	3	-	-	0.37
77	13	12	5	-	-	0.55

$$\Sigma vi = 8.70$$

$$\text{Cronbach Alpha } (\alpha) = \frac{K}{K-1} \left( 1 - \frac{\Sigma vi}{vt} \right)$$

where

$$\begin{aligned} k &= 17 \\ \Sigma vi &= 8.70 \\ vt &= 38.52 \end{aligned}$$

Substituting, we have that

$$\begin{aligned} \alpha &= \frac{17}{16} \left( 1 - \frac{8.70}{38.52} \right) \\ &= 1.06 (1 - 0.23) \\ &= 1.06 \times 0.77 \\ &= 0.8162 \\ &\approx 0.82 \end{aligned}$$

SECTION E:

n = 30

ITEM	VHR (5)	HR (4)	R (3)	SR (2)	NR (1)	Vi
78	18	9	-	3	-	0.87
79	18	12	-	-	-	0.25
80	15	15	-	-	-	0.26
81	12	15	3	-	-	0.42
82	16	13	1	-	-	0.33
83	15	12	3	-	-	0.46
84	13	17	-	-	-	0.25
85	24	6	-	-	-	0.17
86	18	9	3	-	-	0.47
87	9	9	12	-	-	0.71
88	15	12	3	-	-	0.46
89	27	3	-	-	-	0.09
90	12	13	5	-	-	0.53
91	27	-	3	-	-	0.37

 $\Sigma vi = 5.64$ 

$$\text{Cronbach Alpha } (\alpha) = \frac{K}{K-1} \left( 1 - \frac{\Sigma vi}{vt} \right)$$

where

$$\begin{aligned} k &= 14 \\ \Sigma vi &= 5.64 \\ vt &= 21.00 \end{aligned}$$

Substituting, we have that

$$\begin{aligned} \alpha &= \frac{14}{13} \left( 1 - \frac{5.64}{21} \right) \\ &= 1.06 (1 - 0.269) \\ &= 1.06 \times 0.731 \\ &= 0.77486 \end{aligned} \quad . \quad 0.77$$

**OVERALL RELIABILITY ESTIMATE OF THE INSTRUMENT USING CRONBACH ALPHA**

$$n = 30$$

Section	Variance (vi)	Total Variance (vt)
A	6.58	25.62
B	22.50	61.58
C	10.03	48.33
D	8.70	38.52
E	5.64	21.00
<b>TOTAL</b>	<b>53.45</b>	<b>195.05</b>

$$\text{Cronbach Alpha } (\alpha) = \frac{K}{K-1} \left( 1 - \frac{\sum v_i}{vt} \right)$$

where

$$\begin{aligned} k &= 91 \\ \sum v_i &= 53.45 \\ vt &= 195.05 \end{aligned}$$

Substituting into formula, we have that

$$\begin{aligned} \alpha &= \frac{91}{90} \left( 1 - \frac{53.45}{195.05} \right) \\ &= 1.01 (1 - 0.27) \\ &= 1.01 \times 0.73 \\ &= 0.7373 \\ &\approx 0.74 \end{aligned}$$

## APPENDIX F

### LIST OF REGISTERED ELECTRICAL AND ELECTRONICS INDUSTRIES IN ENUGU STATE

S/N	NAME	ADDRESS
1	Kew Power Engineering Company Limited	Ozalla Street, Enugu.
2	Hians Technology Limited	Trans Ekulu, Enugu
3	Fidecool Engineering Works	S14C Damija Road Trans Ekulu, Enugu.
4	Anigbo Hyginus Ifeanyichukwu	Onuagwu Street, Enugu
5	Nandytex	New Layout, Enugu
6	Belco Enterprises Nigeria Limited	Ibiam Street Uwani
7	Auscom Electronics	Onwudiwe Street, Enugu
8	John and John Nigeria Limited	Agbani Road
9	Jonathan De General Enterprises	Awkunanaw Street, Enugu
10	Bro Joe Electronic	Oraukwu Street, Enugu
11	Deum Daniel Investment	Isieke Street, Enugu
12	Nde Noas Trainer	Amuri Road, Enugu
13	Emitex Investment	Abakpa Park, Enugu
14	Lisa Meks Enterprises	Kenyatta Street, Enugu
15	Nicodoson Mechnaic Services	Uche Okoro Lane Mainland, Enugu
16	S.A. Hillson Global Limited	Onyuyi Link Road, Enugu
17	Harrimas Multi Business Limited	Presidential Avenue, Enugu
18	Benny Brothers Electronics	Zik Avenue, Enugu
19	El-Shaddai Aluminium Manufacutring Company Limited	Kenyatta Street, Enugu
20	Bath Referigerator	College Road, Enugu
21	Royken Electrician	Amangwu Street, Enugu
22	Chuks Electronics	Akpa Street, Enugu
23	Peak Nigeria Company	Anyeagbunam Street, Enugu
24	Chinedu Worzingda	Formal Motor Park, Enugu
25	Amachs Electrical Services Nigeria	Corporative Layout Upper Housing Estate
26	C-Ekpe Electrical Company Limited	Kenyatta Street, Enugu
27	Joe Best Electrical Shop	Nike Road, Enugu
28	Hon IK International Industrial Electrical	Youth Council Plaza, Kenyatta Market
29	Buchi Electrical	Edwa Road Nnaji Street, Enugu

30	Joe N. and Brothers Electrical Stores	Enugu Road, 9th Mile Corner
31	Mobi Electrical Enterprises	Osumenyi Street, Enugu
32	Gods Time Electrical Stores	Adelabu Street, Kenyatta, Enugu
33	Chuwill Electrical	Nike Lake Resort Road, Enugu
34	Kachi Electrical Engineer	Ebeano Modern Market, Plaza
35	Potech Electrical Engineering Works Limited	Ohafia Street
36	Akachukwu Sunday Alor Electrical	Adelabu Street, Enugu
37	Bright Electrical Engineering Company	Obioma Street, Achara Layout Enugu
38	Inter Electrical Tech. Nig.	19 Ogui Road, Enugu
39	G.N. Ogala Electrical Eng. Works	74 Zik Avenue, P.O. Box Uwani, Enugu.
40	Powerflow Installations Limited	Lugard Crescent, Enugu
41	Mr. Voucher	New Anglican Road, Enugu.
42	Samtex Nigeria	Enugu North, Enugu
43	Suntech Electronics	Abakpa Nike Enugu East, Enugu
44	Ifeanyi Enteprrises	Abakpa Nike, Enugu.
45	Fab Electrical/Electronics Company	Udi Enugu Ngwo
46	Pioneers Electronics	Abakpa Nike, Enugu
47	Livingmezie Electrical and Mechanical Engineering Contractors Company Nig. Ltd.	New Haven, Enugu
48	Hamon Acceptances Nig. Limited	G.R.A. Enugu
49	GT Electronics Nig. Ltd.	Enugu North, Enugu
50	K.C. Japan Company Nig.	Enugu East
51	Bobb Electronics Nig. Limited	Enugu North
52	G. Achievers Electrical Company	Trans Ekulu Enugu
53	UCE Electronic Nigeria Limited	Enugu North
54	Eyisco Nigeria Limited	Enugu North
55	Harmon Acceptance Nig. Limited	Enugu North
56	Price Electronics	Enugu East
57	Living Spring Resources Multiventures	Enugu South
58	Barrioh Electronics	Enugu North
59	Valentino Electronics	Enugu East
60	Sammy Electronics	Enugu East

61	Pato Electrical and Electronics	Enugu South
62	Johnehukwu Electrical and Electronics	Enugu North
63	Igwe Electrical	Enugu South
64	Value City Electronics	Enugu North
65	Anyitex Investment Company	Udenu Enugu
66	Ejike and Company Nig.	Enugu East
67	Dan Electrical Venutres	Udi Enugu
68	Olife Electronics Plaza	Enugu South
69	Godisco Electronics	Enugu North
70	Innoma City International	Enugu East
71	Zuloh Services Nig. Ltd.	Enugu North
72	Odyson Electronics Ltd	Enugu North
73	Agochukwu Okpalaoka and Company	2 Ogufere Street, Enugu North
74	Emowills	1 Ugwueke Street Abakpa Nike Enugu
75	E-Solve Nigeria	93 Upper Chime Avenue, New Haven, Enugu
76	HolyCab Enugu Tax App.	105 Chime Avenue, New Haven, Enugu
77	Echecity Entertainment	51 Ebonyi Paint Road, Garriki, Enugu