

**STRATEGIES FOR ENHANCING TEACHERS USE OF INSTRUCTIONAL MATERIALS
FOR TEACHING ELECTRICAL INSTALLATION AND MAINTENANCE WORK (EIMW)
IN TECHNICAL COLLEGES**

IN NIGER STATE

BY

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2017/3/68148TI

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA, NIGER STATE

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION

(ELECTRICAL/ ELECTRONICS TECHNOLOGY EDUCATION)

AUGUST, 2021

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

**IN PARTIAL FULFILMENT OF THE REQUIREMENT OF THE AWARD OF BACHELOR
OF TECHNOLOGY (B-TECH) IN INDUSTRIAL AND TECHNOLOGY EDUCATION
(ELECTRICAL/ELECTRONICS TECHNOLOGY)**

AUGUST, 2021.

DECLARATION

I hereby declare that this project is carried out by ADAMU AHMED with the Matriculation number 2017/3/68148TI, an undergraduate student of the Department of Industrial and Technology Education certify that this is my work and has not been presented in any form for the award of degree in any University or institution and all published works are acknowledged by means of reference.

ADAMU AHMED

2017/3/68148TI

Name & Matric No

Signature/Date

CERTIFICATION

This is to certify that the project title Strategies for enhancing Teachers use of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger State was carried out by ADAMU AHMED and meets the regulation governing the award of degree of Bachelor of Technology (B- Tech) in Electrical and Electronics Technology Education, Department Industrial and Technology Education. Federal University of Technology Minna Niger state.

This project is approved for its contribution to knowledge and literacy presentation.

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(H O D)

External Examiner

Sign/Date

DEDICATION

This research project is dedicated to almighty Allah.

ACKNOWLEDGEMENTS

My profound and sincere gratitude goes to God Almighty, for his mercy, kindness, wisdom, knowledge, provision, protection, and guidance throughout the course of my academic pursuit. I am highly grateful to my project supervisor Dr. A. M. Hassan who really devoted much of his time reading, guiding, and providing me some useful suggestion and constructive criticism that improved the quality of this work and also whose patience and understanding made this research a success. My sincere gratitude goes to the Head of Department Dr. I. Y. Umar, Dr. G. A. Usman, Mal. S. A. Musa, Dr. Emmanuel Raymond, Dr.Saba, Mr. Abutu Francis and other lecturers in the Department for their contributions and fatherly advice toward my academic success. I pray that God will continue to bless you and your family.

My heartfelt appreciation goes to my loving parents Alhaji Ahmed Barka Jajere and Maimunah Muhammed Jajere for their immense support starting from the beginning to this point, financially, spiritually, and physically. I pray that God continue to protect you and make you eat the fruit of your labour.

My appreciation also goes to the principals and teachers of technical college's Niger state for their support and contribution toward the completion of my study. My appreciation and gratitude goes to all my family and friends for their untimely supports and prayers toward the accomplishment of my study, I pray may Allah continue to shower his mercy and blessing on you and your family

ABSTRACT

This study was conducted to examine the Expose Strategies for Enhancing Teachers use of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical Colleges in Niger state. This study therefore, used descriptive survey to investigate the strategies for enhancing teacher's use of instructional materials. The population for the study was 28 and sample size was 28 based on Research Question. The data was collected with the help of three research assistance. The data collected was analyzed using mean and standard Deviation. The study revealed that the Instructional materials save time, Instructional materials Enhance teaching and learning Electrical Installation and Maintenance work. This research study found that teaching without instructional materials is ineffective and therefore teachers should try to utilize the available instructional materials for effective teachings and learning. Recommendations were made which include the government should put efforts in providing school with the necessary instructional materials especially those that are up to date and efficient such as computers. Seminars and in-service trainings and workshops should be organized by the ministry of education for inexperienced teachers to understand what instruction materials are all about, their importance in teaching/learning and how to make use of them, Curriculum planners and implementation and educational policy makers should sensitize the school and teachers on the need to put more emphasis on utilization and imprecision of resources materials in teaching of Integrated Electrical Installation and Maintenance Work (EIMW). Teachers should be encouraged to adapt positively to changes in material uses and not shy away from it, they should be able to improvise either by substitution or construction; any time the need arises.

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CHAPTER ONE

INTRODUCTION

1.0 Background of the Study

Technical Colleges are charged with the production of craftsmen and technicians Bakare (2016). Similarly, Akpan (2013) said that technical Colleges are designed to prepare individuals to acquire practical skills, basic scientific knowledge and attitude required as craftsmen and technicians at sub-professional levels. Okoro (2016) pointed that they are regarded as the principal Vocational Institutions in Nigeria that give full vocational and Technical training intended to prepare students for entry into various occupations as operatives or artisans and craftsmen. Graduates who undergo training in Electrical Installation and Maintenance Work Practice are expected to possess work skills for success in Installation of electrical machines and equipment, maintenance of Electrical machines and equipment, winding of Electrical machines, testing and inspection of electrical Installations, repair of electrical machines

Electrical installation and Maintenance work (EIMW) is one of the trades in technical colleges. It is made up of the following components, domestic and industrial installation; cable joining; battery charging and repairs and winding of electrical machines (NBTE, 2014). In the view of Nwachukwu, Bakare and Jika (2015), electrical installation trade is a vocational course offered by students in technical colleges in order to produce electrical craftsmen and technicians. Electrical installation student is a person who is taking vocational course offered in technical colleges in order to become electrical craftsman. Nwachukwu (2015) opined that electrical installation students learn the basic skills required to operate, maintain, install and repair electrical installation equipment and appliances in technical colleges.

Teachers of Electrical Installation and Maintenance Work (EIMW) are the ones who give instructions and impart knowledge, skills and attitudes to EIMW students. Teachers are the conduit through which knowledge and practical skills of EIMW could be transmitted as such he should use appropriate teaching and supervisory strategies together with learning resources, and Teacher must use relevant pedagogy that will enhance students' acquisition of practical skills through activity-based instruction where students are given opportunities to be more active in the class. The teacher is expected to plan his lesson properly by carefully choosing the objectives of the lesson, devising on making the learners participate in the learning process in a more responsible way, selecting the appropriate strategies of teaching, appropriate strategies for supervision as well as determining the appropriate strategies for assessment.

Instructional materials are fundamental resources for schools for enhancing instruction, furthering the pursuit of knowledge, and providing experiences of educational significance for class groups or for individual students, (Obanga 2014). Similarly, Njoku (2015) defined instructional materials as any human and material resources used by the teacher to promote greater understanding of learning experience. They include resource persons and various materials like whiteboard, pictorials, flashcards, projector, slides, film stripe and language laboratory. This informs that for a given instructional procedure to achieve desired objectives, it must be properly harnessed through adequate and proper use of instructional facilities.

Instructional materials play a vital important role in the teaching and learning process of Electrical Installation and Maintenance Work (EIMW). It enhances the memory level of the students. At this time that education has spread wide and entirely, oral teaching cannot be the key to successful pedagogy; therefore, the teacher has to use instructional materials to make teaching and learning very interesting in Basic Science Hulls and Raw (2016). Abdullahi

(2014), instructional materials are tools locally made or imported that help to facilitate the teaching and learning process. Obanga (2014) view them as materials things which are used to composed ported that could make tremendous enhancement of intellectual use impact the instructional materials Competency is the ability to do what is needed Ukoha (2016). Ukoha (2017), defined competency as the ability needed to administer technical skills and knowledge. Accountability and mastery learning are the basic principles of competency based education both in teaching and learning. The innovation is characterized by clearly stated, attainable and measurable objectives followed by identified specific knowledge and skills that learners have to master within a given time frame. Learner's progress is systematic and performance level is criterion referenced, that is, competencies are measured against previously set standards.

Assessment can be defined as the process of gathering on going and comprehensive information about specific aspects of a child's knowledge, behaviour, skill level, or personality for the purpose of making evaluative decisions (Bakare, 2016). Assessments can be conducted for different purposes. Screening and diagnostic tools were developed to make identification and placement decisions for individual children.

Assessments can also be used to identify appropriate curricula and teaching strategies for individual children and to document children's progress over time. For example, teachers can develop a systematic plan to document progress in attending to a task and to identify which teaching strategies help her. This type of assessment is referred to as program assessment. Program assessment tools can also be used for program evaluation purposes when comparing the performance of groups of children before and after instruction. For example, teachers can gather data on children's language and literacy behaviours at the start of the school year, before they begin daily picture book reading, and then again at the end of the year. This study

will be on Strategies for Enhancing Teachers use of Instructional Materials for Teaching Electrical Installation and Maintenance work (EIMW)

1.1.Statement of the Problem

The use of instructional materials in Technical Colleges is not encouraging. As a result, it makes the morale and interest of the students in Electrical Installation and Maintenance Work trade (EIMW) low. This is because teachers adopt the verbalistic and theoretical method as a way of teaching and teach the subject, mainly due to lack of competency of Teachers and non-availability of instructional material in Technical colleges.

Lack of competence teachers in the use of instructional material in Technical Colleges lead to poor performance of students and also teachers are not academically competent to teach the Electrical Installation and Maintenance work trade (EIMW) as result of inadequate of instructional material for teaching Electrical Installation and Maintenance work trade (EIMW). The implementation of the Students curriculum effectively depends on the competence of the teachers. The Results of Technical Colleges in Niger State reveal that students' performance in Electrical Installation and Maintenance work trade (EIMW) is not encouraging. Due to lack of qualified teachers, lack of practical with the use instructional material of Electrical Installation and Maintenance work trade (EIMW), and poor method of teaching, non/poor use of instructional materials etc. Mathew (2014) stated that the use of instructional materials makes teaching and learning effective as it enables learners to participate actively in classroom instruction. So lack of competence of Teachers in the use of instructional material is a great problem in teaching and learning, poor academic performance

of students in Electrical Installation and Maintenance work trade (EIMW) has been of much concern to all and sundry.

It has been said that instructional materials are objects or devices which help the teacher to make learning meaningful to the learners.

Therefore, teaching and learning in Electrical Installation and Maintenance work trade (EIMW) could be enhanced to a great extent by using instructional materials based on contexts, because such resources would be more authentic and more relevant to students' needs.

1.2 Purpose of the study

The purpose of this study was Strategies for Enhancing Teachers use of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical Colleges in Niger state. Specifically, the study determined the:

- i. Importance of Instructional Materials being use for teaching Electrical Installation and Maintenance work (EIMW) in Technical Colleges in Niger State
- ii. Types of Instructional Materials use for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state
- iii. Strategies for Enhancing Teachers use of Instructional Materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state
- iv. Factors Affecting Teachers use of Instructional materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state
- v. Factors Guiding the Selection of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state

1.3 Significance of the Study

The findings of this study would be of great benefit to all students of electrical installation and maintenance works (EIMW), Technical Teachers, Government, Curriculum Planners, Educational Administrators, Parents, Employers of labour and the society in general.

The students would acquire relevant knowledge, ability and skills in Electrical Installation and Maintenance (EIMW) through their active involvement in EIMW lessons. This will make them to become creative, reflective, competent, resourceful and self-confident. It will improve their skills in the use of student centred approach such as Problem-Based Instruction (PBI). In so doing, it will assist to arouse the interest of the students to become confident and trust their ability in performing practical work in electrical installation and maintenance works.

The findings of this study would indirectly be of benefit to the teachers as they will identify their own weakness in teaching and learning of Electrical installation and maintenance work (EIMW) technology and improve in such areas. With such an improvement teachers and students will learn better skills, knowledge and attitude.

The findings would help government to make policies in line with the instrument and objectives of technical education in technical colleges. It will also help technical colleges make for uniform assessment pattern for practical project.

Educational researchers can benefit from the findings of this study which will also serve as a source of literature for future researchers researching on the related topics. The researchers will benefit by using the information contained therein for their different research purposes.

The findings of this study can also be of benefit to the society. The society can also benefit from the findings of the study in the sense that electrical teachers or electrical graduate can apply the identified predictive maintenance to help the people in the society in maintaining their electrical equipment.

National Board for Technical Education is responsible for designing the curriculum for Technical Colleges in Nigeria. The findings of this study can help the curriculum planners in National Board for Technical Education to integrate identified reliability centred maintenance work skills into the curriculum of electrical installation maintenance work in Technical Colleges.

1.4 Scope of the study

This study seeks to determine the Strategies for Enhancing Teachers use of Instructional Materials for Teaching Electrical Installation and Maintenance Trade (EIMW) in Technical Colleges in Niger state. Specifically, it focuses on technical colleges Niger state. This study will cover major issues facing the use of Instructional Materials for Teaching Electrical Installation and Maintenance Trade (EIMW) in Technical Colleges in Niger state, as highlighted in the objectives of the study.

1.5 Research Questions

The following research questions guided the study:

- i. What are the Importance of Instructional Materials use for teaching Electrical Installation and Maintenance work (EIMW) in Technical Colleges in Niger State?
- ii. What are the types of Instructional Materials use for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state?
- iii. What are the Strategies for Enhancing Teachers use of Instructional Materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state?
- iv. What are the Factors Affecting Teachers use of Instructional materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state?

- v. What are the solutions for Guiding the Selection of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state?

CHAPTER TWO

RELATED LITERATURE REVIEW

2.0

This chapter contains the review of related literature. The review that carried out under the following sub – headings: -

2.1. Theoretical Framework

2.2. Concept of instructional Materials

2.2.1 Technical Colleges and Electrical Installation and Maintenance work

2.2.2 Impact of Instructional Materials in Teaching Electrical Installation and Maintenance work (EIMW)

2.2.3 Importance and use of Instructional Materials

2.2.4 Factors that Affect the Use of Instructional Materials

2.2.5 Strategies for enhancing Teachers use of Instructional Materials for Teaching Electrical Installation and Maintenance work (EIMW)

2.2.6 Factors Guiding the Selection of Instructional Materials for Teaching Electrical Installation and Maintenance work (EIMW)

2.2.7 Types of Instructional Materials

2.3. Review of Related Empirical Studies

2.4. Summary of Literature Review

2.1 Theoretical Framework

This study was guided by the following learning theories:

Piaget's Theory of learning

Piaget's cognitive theory of learning refers to the stage theory of cognitive development. According to Piaget, children develop knowledge by inventing or constructing reality out of experience and thus mix their observation with their ideas about how the world works.

Piaget observed that people of the same age level (especially children) have a similar line of reasoning. This indicates that cognition develops stage by stage. Piaget used the terms 'Assimilation' and 'Accommodation' to explain his views.

Assimilation: Assimilation means a process of interpreting actions or events in relation to one's schemas. This refers to a means of fitting reality into one's existing structures of knowledge. The term 'schemas', for Piaget, refers to a well-defined sequence of physical and mental actions.

Accommodation: This is the modification of existing schemas to fit reality. The organism is capable of learning when it can modify its schemas. As the organism continues to accommodate, it continues to learn. Piaget believes that cognition develops from age to age and from level to level. According to him, the driving force for cognitive development is equilibration. By equilibration, Piaget means balancing assimilation and accommodation to adapt to the demands of the environment. He believes that for people to learn, they must assimilate and accommodate. Piaget also opined that at each stage of development, people use a distinctive underlying logic or structure of reasoning to guide their thinking. Piaget identified four stages of cognitive development – sensorimotor, pre-operational, concrete

operational and formal operational to explain cognitive development from infancy to adolescence. However, we should be concerned with the ‘formal operational stage’

Jerome Bruner’s Learning Theory

Bruner introduced the concept of learning by discovery. Bruner is of the view that learning is effectively engaged in if the learner is given the opportunity to discover facts by him/herself. Bruner argued that mere presentation of information will not enhance effective solution of a problem. The theory stresses cognitive effectiveness. Because of this, some referred to Bruner’s theory of learning as Bruner’s theory of cognitive development. Bruner believed that learning by discovery begins when science teacher purposefully (i.e. intentionally) create (present) a problem and present it to the students by introducing some inconsistencies (i.e. contradictions) among source of information which are given in the process of instruction. According to Bruner, such inconsistencies lead to intellectual discomfort that will stimulate (i.e. motivate) the students to initiate individual discoveries through cognitive restructuring (i.e. internal reorganization).

The intellectual discomfort created by the inconsistencies makes the learner to attempt to bring order out of this confusion by engaging in mental processes i.e. discovery activities which involve observation, hypothesizing, measuring, stating problem, data collection, classifying, inferring, etc. Through mental processes, the student can generate facts from his/her desperate experiences. Experiences gained during the mental processes enable the students to sense the disparity.

According to Bruner (2017) there are two forms of discovery processes which are:

Assimilation: This occurs when a student recognizes a new situation that is familiar to one of the elements in the existing structure of knowledge (i.e. cognitive structure) and he/she easily assimilates it.

Accommodation: This occurs when a new situation (i.e. a new knowledge) is incompatible to the existing structure of knowledge (i.e. cognitive structure) the learner first restructures (i.e. reorganizes) his/her cognitive framework (i.e. cognitive structure) in order to be able to accommodate the new knowledge.

Bruner believes that the students should find out information on their own using mental processes. Discovery learning, when encouraged in science instruction also aids problem solving because learning by discovery starts with problem solving (Aknmoyewa2016). Discovery learning also stimulates creativity in the student, which is one of the major objectives of science teaching/learning.

Application of Jerome Bruner's Theory of Learning to Science Teaching/Learning: The science teacher should intentionally create or present problems to students either in form of apparent contradiction or inconsistency among sources of information which are giving in the process of instruction. Encouraging discovery learning in science class by science teachers will result into aiding problem solving. One of the major objectives of science teaching is creativity. Therefore, discovery learning encourages creativity. Students should be taught concepts in such a way that they have applicability beyond the situation in which they were learned. Retention of science concepts are aided by knowledge acquired through discovery learning. Bruner advocated the fundamental structure of curriculum to begin with simple contents and later graduated to complex contents. That means that learning should proceed from simple to complex, from concrete to abstract, and from specific to general. Teaching should be inductive.

2.2. Concept of Instructional Materials

Instructional materials have borne several nomenclatures from the colonial concepts of apparatus to teaching aids, teaching aid to educational media, educational media to instructional technology, instructional technology to curriculum materials, curriculum

materials to its modern nomenclature-instructional materials. Each of these conception stages depicts the scope of its usage and application in the classroom. But according to Eya (2015), the general acceptable nomenclature by professionals of education is the term “Instructional materials.”

Effiong and Igiri (2015) described instructional materials as print and non-print items that are rested to impact information to students in the educational process. Instructional materials include items such as: kits, textbooks, magazines, newspapers, pictures, recording videos etc. Instructional materials play a very important role in the teaching and learning process. It enhances the memory level of the students. At this time that education has spread wide and entirely, oral teaching cannot be the key to successful pedagogy; therefore, the teacher has to use instructional materials to make teaching and learning process interesting, Abdullahi (2015). According to Olawale (2016) instructional materials include materials used to facilitate learning for better results. In the same vein, Uzuegbu, Mbadiwe&Anulobi (2016) refer to instructional materials as any device used to assist the instructor in the preparation of a lesson, teaching of the lesson and facilitate students’ learning of the subject matter. They include those objects that are commercially acquired or improvised by the teacher to make conceptual abstraction more concrete and practical to the learner (Iwu, Ijioma, Onoja&Nzewuihe, 2017) According to Abdullahi (2017), instructional materials are tools locally made or imported that help to facilitate the teaching/learning process. Instructional materials are indispensable in the teaching and learning process at all levels of educational system. They are referred to as a veritable channel through which instructions can be impacted in the classroom

Scanlan (2017) indicates that “instructional materials” encompasses all the materials and physical means an instructor might use to implement instruction and facilitate students’ achievement of instructional objectives. This may include traditional materials such as

chalkboards, handouts, charts, slides, overheads, real objects, and videotape or film, as well newer materials and methods such as computers, DVDs, CD-ROMs, the Internet and interactive video conferencing.

According to Azikiwe (2017), instructional materials cover whatever the teacher uses to involve all the five senses of sight, hearing touch, smell and taste while presenting his lessons. In a similar vein, Adegun (2018) says that instructional material are things which are intended to help to teachers to teach more effectively and enable the students to learn more readily. Talabi (2018) asserts that instructional materials are generally designed to provide realistic images and substitute experience to reach curriculum experiences. The materials are considered the most efficient facilitators in the education set up. They are not substitutes for the teacher. Their use however, calls for an imaginative approach by the teacher who needs to constantly be on the alert for new ideas and techniques to make the lessons presented with different instructional materials achieve effective outcomes.

Nkuuhe (2018) holds the view that instructional materials are all devices and materials used in the teaching and learning process. According to Adekola (2019), instructional materials are all available human and material resources which appeal to the learner's sense of seeing, hearing, smelling, tasting, touching or feeling and which assist to facilitate teaching and learning. Instructional materials with its various types affect different senses and act as an integral part of teaching and learning process and thus helping to bring about meaningful experiences. An instructional material refers to models, real objects and other materials in addition to the chalkboard and textbooks that are brought to the teaching and learning process to induce understanding.

2.2.1 Technical Colleges and Electrical Installation and Maintenance Work

Vocational education or vocational education and training is an education that prepares trainees for jobs that are based on manual or practical activities, traditionally non-academic,

and totally related to a specific trade, occupation, or vocation. It is sometimes referred to as technical education as the trainee directly develops expertise in a particular group of techniques (One Economy Corporation, 2015). Federal Government of Nigeria (2015) emphasized that the aim of technical education is to give training and impart the necessary skills leading to the production of craftsmen, technicians and other skilled personnel who shall be enterprising and self-reliant. Abassah (2017) opined that technical education contends with training that borders on acquisition of knowledge and skills in woodworks metalwork, electrical/electronics, welding and fabrication, building, auto mechanics etc. including workshop organization and management. There are five technical institutions in Nigeria outside the universities namely; Prevocational and Vocational schools at post primary level, the Technical Colleges, the Polytechnics and the Colleges of Education (Technical) at the post-secondary level established to provide a base for technological take off in Nigeria.

Technical colleges offer practical education for the acquisition of skills as well as basic scientific knowledge. Students interested in technical education either leave for the technical school after the primary School education, after the JSS level or after the SSS level of secondary education. The government has the responsibility of taking care of technical education; every state is required to have at least one institution running advanced crafts courses with an emphasis on the training of technical teachers. Technical teachers have to provide quality technical training that keeps pace with quality control in technical education (Odu, 2016). This means that the electrical teachers have to plan their lessons based on good instructional objectives as well as see the learners through practically.

Electrical Installation and Maintenance work trades offer adequate theoretical background to students as well as acquainting them with practical skills in the laboratories and workshops of the department. Students who specialize in electrical Installation and Maintenance work trades study in details various types, characteristics, operation, maintenance, and testing of

these machines (including all types of AC and DC machines). Students also study in details electrical device used to control these machines at the electrical laboratory.

2.2.2 Impact of Instructional Materials on Teaching Electrical Installation and Maintenance Work

Many educationists agree that instructional materials bring about improvement in the teaching/learning process as well as permit teachers and students to interact as human beings in a climate where people control their environment for their own best purposes (Aniayewu,2016). Also, most educators generally and equally agree that the creative use of variety of instructional materials will increase the probability that student would learn more, return better and bring about the skills they are expected to perform (Adewoyin,2015).

Apart from their ability to process meaningful sources of information, instructional materials help the teacher with the means of extending his horizon of experience as well as providing the teacher with rich sources of procuring communicative materials which could be produced jointly by the teacher and the students (Osalusi,2015). Furthermore, several students have been conducted to test the value of instructional materials and other sensory devices. These researches here proved that instructional materials when properly used in teaching learning situations can accomplish a lot of complex tasks (Lowenstein, 2016). The instructional materials also offer real experiences in giving the teacher basis for thinking and understanding. They supply concrete basis for conceptual thinking and therefore reduce meaningless responses of students (Ismail & Aleem,2017). At the same time, they overcome the limitations of time, space and size by helping the students to understand things that are too small or too big, or too slow or too fast (Adeniyi,2017).

Therefore, instructional materials can provide members of a group with a common or joint experience. The break language barriers and ease difficulties and in the end make the lesson more meaningful. They save time and thus enable students grasp ideals more

effectively and faster. Likewise, they help to simplify and emphasis facts and clarify difficulties.

They reinforce other teaching methods and materials. They improve the efficiency of other method and effectiveness of teaching process.

However, before a teacher selects his instructional materials, he should consider the following which will serve as his criteria for selection.

- (a) **Relevance:** As much as possible, teachers should make sure that the Instructional Materials so selected can be used to achieve the objective of the particular lesson. It is wrong for a teacher teaching metal work tools to come into the class with a wood required to teach driving tools. In this case, the instructional materials cannot be relied upon to achieve the objective of the lesson.

Care must be taken to ensure that only instructional materials that relate to the topic are used while teaching.

- (b) **Cost:** The instructional materials should be within the reach of the teacher or the school. The cost of the instructional materials will determine whether it can be bought and used or not; otherwise the teacher selects only that instructional material that costs less. In an event of the inability of the school and age limit. It is wrong to bring into the class instructional materials that cannot be easily used to convey meaning of facts, ideas and concept to the students because of the limit of the learner. A primary one school child may not be interested in a lesson in which telescope is used to present facts. This means teaching instructional materials are not just selected on the basis of their attractiveness but on the basis of certain criteria that will ensure their effectiveness in the teaching and learning processes.

2.2.3 Importance and Uses of Instructional Materials

According to Bajah, (2017) the followings are some of the reasons for using instructional materials:

- i. A good instructional material can supplement spoken or written words.
- ii. It can bring teaching to life in a way which word cannot.
- iii. Words can describe people, places and objects but a picture immediately brings reality.
- iv. A teaching aid can simplify and clarify what is complex and difficult to express in words. Instructional materials have motivational value for them to develop the interest of the student.
- vi. Instructional materials can also promote retention as we can understand from the Chinese proverb that says “what I hear I forget, what I see I remember, what I do I understand”.
- vii. They save time, and energy what you will explain in ten minutes, will be possible in less time with the use of instructional materials.

Aids implies to help in teaching of Electrical Installation and Maintenance work trade (EIMW), not to be substitutes for teaching the subject, nor for teaching, rather, it should be used to supplement oral explanation and descriptions. Adeyemo (2016) stated that basic technology involves a lot of simple tests and activities while the students must involve in, at the secondary school level so as to acquire the necessary skills and experiences. This can only be enhanced with the aid of instructional material. Bakare (2017) said, “instructional material” include self-supporting materials which are used by the teacher to present a complete body of instruction”. They make a lesson to become more explicit and interesting. Teaching aids are prime importance of both dull and bright students. Ogundele (2017) considered teaching aids as an essential part of teaching methods which helps the teacher to express its subject concept to the learners thus promoting students’ performance. That, such

aids or materials, should be the responsibility of the basic technology teachers. Olaitan (2018) stated that instructional materials are normally used during instruction to enhance proper or effective learning and to encourage retention. They reduce the workload of the Electrical Installation and Maintenance work trade (EIMW) teacher in the classroom, reinforce and add clarity to learning. Ozorehe, (2018) said that instructional material aids teachers' competence and effectiveness of instruction and class control. It makes the learning environment more attractive, appreciable, conducive, bearable and realistic. The learner's attention is better controlled and sustained. Section ten in the National Policy in Education stated that objectives of learning materials are to:

- i. Enhance teaching and improve the competence of teachers.
- ii. Make learning more meaningful for students
- iii. Develop and promote the effective use of innovative materials in schools.

In the same line, Ajayi (2018) outlined the following reasons for using teaching aids in teaching and learning process in our educational settings. They aid learning by aiding the sense of seeing, hearing and touching. They direct teachings to its goals, makes lesson become interesting, arouse students' interest and motivate them to learn. Teaching aids are valuable in the following situation:

- a. When the object of instruction is either too big or too small to too spread out to be seen effectively by the students
- b. When an object is inaccessible to students, such should be displayed to the class with models.
- c. When a process being studied is very slow, the Electrical installation and maintenance work teacher may use pictures or diagram or circuit to illustrate the various stages involved.

When using teaching aids, it is important for Electrical installation and maintenance work teachers to consider the following suggestions.

- i. Ensure that the material is accurate and acceptable to the students.
 - ii. Preview such materials before using them in the class
 - iii. Arrange the materials in such a way that the students will see it from the place they are sitting.
 - iv. Use the materials in the appropriate time in the lesson and after that remove them.
 - v. Do not use only one type of teaching aid to the exclusion of others.
 - vi. Always remember that students are different in age/maturity, interest and experience.
- It is always an advantage to combine the aids to meet the need of various students. The class needs showed determination of the types of aids to be used. Do not cause confusion by presenting too much information (Ajayi, 2019).

Ajayi, (2019) further observed that instructional materials are versatile tools that used in different ways for effective teaching and learning of Electrical installation and maintenance work. These aids convey facts and ideas in all forms of communication. They offer quite an easy way of presenting information.

Students' poor performance at the senior secondary level, as indicated in the last paragraph, points to one thing; everything was not well with the education received by the students at the junior secondary school, the level that is of interest of us. That they performed poorly in subjects like physics and mathematics could only mean that they had not been properly groomed in subject like Electrical installation and maintenance work at the SS1, SS2 and SS3.

Ajayi (2019) further outlined some of the importance of instructional materials if the materials or resources are carefully selected, they should:

1. Help to give correct initial concept.

2. Help students to learn more
3. Speed learning processes
4. Provide experiences which are not known before
5. Arouse interest by attracting attention
6. Clarity and give definite meaning to words and the combat verbalism.
7. Intensity expressions
8. Supplement other learning and serves as reminder.
9. Save time of basic technology teachers and students.
10. Motivate, develop and change attitudes
11. Vitalize instruction and provide variety in teaching
12. Build and sustain interest

Ibrahim (2018) stated that instructional material assists basic technology teachers in the achievement of stated objectives and also help the teachers to make lesson explicit to the students. Fakomogbom (2019) also reported that instructional materials possess the quality of influencing the physiological, motivational and structural position of the learners. It aids the achievement of any one of the following in the teaching learning process: Attention and motivation, orderliness in the classroom, lesson presentation, recall and remembering, guidance, active participation and response, feedback, assessment of performance and evaluation.

Oladipo (2018) asserted that instructional materials are important tools for enriching, visualizing, simplifying, transmitting and accelerating the teaching and learning processes, thus enhance students' academic performance in Electrical installation and maintenance work.

2.2.4 Factors that affect the use of Instructional Material

Teachers have been found to have difficulties in selecting and using instructional materials for teaching. Part of the difficulties has been that teachers tend to teach the way they were taught in their training (NERCD, 2017). Consequently, teachers use the materials they were exposed to during their training. This habit is often difficult for teachers to change. Other reasons advanced for the inability of teachers to use instructional resources effectively include:

Inability to identify/ locate resources;

Inability to develop appropriate materials from local resources;

Lack of school- based resource Centre.

For instructional materials development, selection and utilization and Lack of short term training to update teachers' knowledge and skill for instructional materials development, selection and utilization (NERDC, 2017).

Bakare (2018) outlined the following factors:

- (a.) Nature of the subject matter and the objectives to be attained: If the subject matter is such that is diversified, it may involve the use of more than one type of instructional material to achieve its objective.
- (b.) Number of learners/students involved: If the numbers of learners to be taught are up to one hundred (100), it would be more logical and efficient to use microphone for the presentation of information.
- (c.) The space of time available: Time is always limited and has its effect upon the kind of instructional materials used. If there is ample time, the Electrical Installation and Maintenance work trade (EIMW) teacher is more likely to use the chalkboard and

other techniques that encourage maximum participation. But when time becomes a limiting factor, the chalk and talk would be preferred.

- (d.) Facilities and materials available: The kind and extent of physical facilities and the instructional material available, including community resources, affect the choice of instructional materials that can be used.
- (e.) Facilities and Resources (materials) available: The kind and extent of physical facilities and the instructional material available, including community resources, affect the choice of instructional material that can be used.
- (f.) Interest and ability of Electrical teacher: Most teachers have personal preferences and more security conscious in using selected instructional materials. Other things being equal, the teacher should use the methods that he/she likes or uses best. This does not mean that he/she should not be sensitive to other development that supplement or improve upon the instructional materials he/she frequently uses.

2.2.5 Strategies for Enhancing Teachers' Use of Instructional Materials for Teaching Electrical Installation and Maintenance Work Trade

Instructional materials are derived from various sources; they can be purchased, locally made, imported or even improvised when necessary for effective instructional delivery (Iwu, Ijioma, Onoja&Nzewuihe, 2018). The professional electronics teacher needs to note that every instructional material has its definite unique strength in teaching-learning situation. Furthermore, better teaching and faster learning of electronics principles can be facilitated by careful selection, development and skilful utilization of appropriate instructional materials by the competent teachers. Based on the foregoing, the following strategies are suggested to enhance the teachers' competence in the selection, development and utilization of instructional materials for effective instruction delivery:

- i. Develop positive attitude towards the development and use of instructional materials in instructional delivery in schools.
- ii. The instructional objectives, content learning activities and evaluation instruments should be taken into consideration by the teacher in the selection, development and utilization of instructional materials. In other words, maintain appropriateness of the materials to instructional objectives.
- iii. The content for which the instructional materials are being selected, where in doubt, the teacher should consult. The aphorism that two good heads are better than one good head becomes more relevant in the field of education particularly in teaching.
- iv. Reflect individual differences of learners' characteristics in the use of instructional materials. This is because the age, level, interest, socio-economic background, learning style, physical skills of the learner often varies and hence materials to be selected, developed and used should relate to the individual differences of the learner. This is necessary because learners as human beings learn through various senses and hence the resources/materials that appeal to more than one sense should essentially be utilized.
- v. Economic factor should be considered in selecting instructional materials for use in lesson delivery. Finance is one of the major problems facing schools. Therefore, the teacher must consider the cost of financial implications of the resource to be selected for classroom utilization. There are a lot of resources in the local neighbourhood which innovative teacher can exploit for the benefit of their students.
- vi. Before selecting or developing any resource, consideration should be given on the number of teaching/learning situations to which the resource can be applied. This is because it is more economical to buy or develop a material which has dual usage than

one that can be applied in a single learning situation. Therefore, acquisition of instructional materials having a wide range of practicability is essential.

- vii. The teachers should realize the need for improvisation if the cost of purchasing is high. Such improvisation is a way of increasing inquiry, curiosity, creativity and productive application of intellect.
- viii. Development or improvisation of instructional materials could also be done concurrently with the students such as projects or group assignments in designing and manufacturing some gadgets of learning. This also promotes creativity among students.
- ix. Some dynamic variables such as the size of the target audience, the classroom social climate, sitting, viewing and listening arrangement, available time space, the desired level of learners' response and participation are to be seriously considered in the decision, selection and development of instructional materials for use in lesson delivery.
- x. Once an instructional material has been selected and developed, the teacher should preview the material before they are brought to the class to determine the operational state of the intended material, especially the manipulative aids, before the actual presentation.
- xi. Multidimensional presentations should be encouraged as the use of variety of the materials will increase curiosity and may appeal to more than one sense of the learner.
- xii. At the end presentation with the instructional materials, outcomes should be measured in order to evaluate the effectiveness of instructional delivery.

2.2.6 Factors Guiding the Selection of Instructional Materials

The teacher who wants to use instructional materials should consider the following variables to guide him in the selection of the types to be used in the teaching learning exercise:

1. **Availability:** The teacher should ensure that the instructional materials to be used are easily available for use before the date of use. It means that the materials should be in store and the teachers should look at it and test it before the day of the lesson. If the teacher has to prepare it himself, he should do so at least a day before the lesson. No instructional materials that are not available or not easy to prepare should be noted by the teacher in his lesson plan.
2. **Accessibility:** It is the duty of the teacher to ensure that the materials to be used as instructional materials are not only available but also accessible to him. If they are already made materials, they should be within reach of the teacher on the date and time of use. There should be no excuse that the materials are readily available but locked up in the store because the store-keeper is nowhere to be found or the keys to the store have been misplaced.
3. **Affordability:** The instructional materials to be used should not be expensive the cost should be such that either the teacher or the school can afford. It is no use to say that something is available but not affordable due to high cost. There should be a budget for instructional materials and when this is done the cost should not be outrageous it should be within the budget of the school.
4. **Suitability:** The teacher using the instructional materials should ensure the appropriateness of the materials for his intended learners. The materials should be suitable for their age, experience and intelligence. The legal, safety and ethical aspects of the materials to be used should equally be considered. The materials should not portray any anti-social attitude. They should also be free from any bias, distortion or

prejudice. If the materials would need electric power, then an alternative should be sought to avoid disappointment from Electricity.

5. **Simplicity:** The instructional materials to be used should be simple to operate or manipulate. The teacher should test the materials and ensure their workability before the actual date of use. There should not be any technical problem and where electricity is to be used provision should be made for an alternative power. No teacher should use electric failure as an excuse for non-performance. In a situation where an instrument demands the hands of a technician, he (the technician) should be on hand and the teacher should have an insight into the operation of the instructional materials.
6. **Qualitative:** The instructional materials selected for teaching by the teacher should be of good quality. Teachers should avoid the idea of “managing” with poor quality materials because he might not achieve the desired aim.

The rapid growth of electrical technology offers a formidable challenge to the electrical teacher, who may be almost paralyzed by the mass of details. However, the use of practical instructional materials can simplify the learning process to a great extent. In order to ensure an effective teaching learning process, it is important for the teacher to be thoroughly acquainted with the teaching resources and services available to him. Instructional materials for Electrical Installation and Maintenance Work trade subjects’ instruction at Government Science and Technical colleges are not adequately available more so, how to make the best instructional use of those available with the modern innovation are grossly lacking and faced with a lot of problems in its use by electrical teachers (Bello & Shuaibu, 2018; Medugu, 2018; Umunadi, 2019; Taale & Mustapha, 2019). Some of the revealing problems as highlighted by these researchers include:

- a. Poor teachers' professional knowledge and technical know-how to teach practical skill content areas of Electrical Installation and Maintenance Work Trade (EIMW).

- b. Low teacher competence in the area of effective instructional resource utilization
Failure to appreciate the importance of using instructional materials in promoting and understanding of electronics principles.
- c. Insufficient awareness of types of instructional materials for use in teaching different electrical Installation contents.
- d. Insufficient time allocation to accommodate effective instructional materials utilization in electrical installation and maintenance trade work (EIMW) instruction.
- e. Lack of finance to acquire or improvise needed instructional materials.
- f. Environmental factors such as little or non-availability of equipped library, laboratories, workshops, water supply, electricity and personnel also affects effective utilization of instructional materials.
- g. Poor maintenance culture of existing instructional materials especially projected and manipulative types
- h. Lack of opportunities for in-service training/refresher course for serving electrical installation and maintenance work trade teachers to update their knowledge periodically in the light of new research findings and resource development

2.2.7 Types of instructional materials

Instructional materials can be classified in several ways. For instance, one can distinguish between auditory, visual and reading materials. However, for the purpose of classification, learning materials for teaching Business Studies according to Yusuf (2018) can be classified as follows: -

- i. Printed and reference materials: Textbooks, newspapers, magazines, government documents, teachers' guide, duplicated materials, journals, hand book, bulletins, pictures, work books, pamphlets, and leaflets.
- ii. Graphic materials: Graphs, charts, diagram, maps, globes.
- iii. Display materials: Chalkboard, bulletin boards, flat pictures, magnet boards and flannel board.
- iv. Projected materials: Television, video tape, overhead projector, slides and slide projector and transparencies.
- v. Audio and other visual materials: Radio, model, computer, tape recording etc.

According to Blankenship (2017), Economics teaching aids can be classified into two classes. They are:

- i. Visual aids.
- ii. Audio-visual aids.

The visual aids are those teaching aids that can be clearly seen with our eyes vividly. Examples of visual aids are: chalkboard, Business Studies textbooks, charts, model. While audio-visual aids are those that we can hear and see, by producing sound that the sound are expressed in thought. They appeal to our senses of hear and eyes. Audio visual aids include: tape video, television, projectors and motion pictures

2.3.Review of Related Empirical Studies

Okpalaoka (2018) conducted a study on, management of instructional materials for effective implementation of the Universal Basic Education (UBE) programme in Enugu Metropolis. Four research questions were posed and two null hypotheses were formulated to guide the study. A 23-item research questionnaire was developed and administered to 114, 340 and 546

primary school teachers in Enugu-East, Enugu-North and Enugu-South respectively in Enugu metropolis. The analysis of the data shows that teachers (administrators and classroom teachers) procure instructional materials majorly by improvisation. Other sources include, donation, gifts, from philanthropists, spirited people and international organizations. Teachers utilize instructional material to demonstrate learning concepts in the classroom. The findings of the study have some educational implications on the current study among which are, the availability of these instructional materials in schools does not really mean that these materials are effectively managed and cared for to bring about effective implementation of UBE programme; some classroom teachers were not using instructional materials to bring about effective learning in the classroom because of fear of damaging them. This simply proves that these teachers still adopt the traditional system of teaching. The school administrators divert funds meant for acquisition and maintenance of instructional materials revealed certain level of inadequacy and low maintenance of instructional materials for teaching and learning process in State owned primary schools.

Igrublia, (2018) carried out a research titled “Availability of instructional materials in teaching and learning of technical subjects in technical colleges in Rivers State”. The main purpose of this study was to examine the availability of instructional materials in teaching and learning of technical subjects in technical colleges in Rivers State. Four research questions were developed and four hypotheses also formulated in consonance with what the study sought to find out. A total of 651 questionnaires were administered and properly completed, retrieved and this was used for data analysis. The questionnaire was validated by three experts and the instrument was pilot tested for reliability using the Cronbach Alpha (α) which yielded 0.88. With 3 mean rating on 5-point scale, influences drawn on the respondents’ score were based on the following decision rule: 4.50-5.00 = very high extent; 3.50-4.49 – high extent; 2.50-3.49 = moderate extent, 1.50-2.49 – low extent, and 1.00 – 1.49

– very low extent. Any groups' score that fell within any category or range adopted the respective extent of participation. The analysis of gathered data with group mean, standard deviation and z-ratio statistics led to the following findings; that availability of instructional materials, availability of personnel in the use of instructional materials and level of safety for availability, instructional materials affects students at low extent while maintenance schedule for available instructional material affect students at moderate extent with no significant differences in the groups perceptions. Consequent upon the findings, recommendations were made as follows: Government should regularly supply instructional materials to meet the students' projected enrolment figure, post primary schools' Board should urgently recruit technical teachers and workshop attendance to fill the gap created by shortage of qualified personnel, principals of technical colleges should design clerical maintenance schedules and enforce compliance by both staff and student's salaries of technical teachers should be at the same rate with their counterparts in the industries, government should also motivate the teachers through in-service training as the will enhance the performance of technical college students.

Unumadu (2019) also carried out a research study titled "the use of instructional materials in the teaching and learning of physics in secondary schools in Port Harcourt". The purpose of this study is to determine the availability and effectiveness of the application of instructional materials in teaching and learning of physics. Questionnaire was conducted and administered to twenty teachers and two hundred and ten students from ten secondary schools in the state. Physics teachers and students formed the respondents. The questions were to determine if instructional materials were available and used in the, schools, their effects on student's academic achievement/ the importance to the teaching and learning process. Simple percentage method was used for the calculations. The findings are instructional materials are available in secondary school, teachers make use of the available instructional materials,

instructional materials make teaching and learning process more effective and easier student's performance is enhanced through the use of instructional materials.

Matthew (2018) carried out a research titled: effects of use of Instructional Materials on students' cognitive achievement in Agricultural Science. The study to find out the effects of use of instructional materials on student's cognitive achievement in agricultural science in Secondary Schools of Orumba South Local Government Area. Quasi experimental design was used. The sample comprised of 256 JS II students randomly sampled from 5 schools drawn from 5 towns in the local government area. The students were divided into two groups (experimental and control, group). An Agricultural Achievement Test (AAT) of reliability 0.82 was used for the study. The experimental group was taught using instructional materials while the control group was taught without instructional materials while the control group was taught without instructional materials. Data collected was analysed using mean, standard deviation and z-test statistics. The findings revealed that students taught with instructional materials performed better than those taught without instructional materials. Also there is no significant difference in the mean achievement scores of male and female students. The null hypothesis tested at 0.05 level of significance indicated that there is significant difference between the achievement scores of those taught with instructional materials. It was therefore recommended that instructional materials be used in teaching in secondary schools because it has positive impact on student's performance.

Nwafor. & Eze, (2018) researched on, Availability and utilization of instructional materials in teaching basic science in selected secondary schools in Abakaliki education zone of Ebonyistate, Nigeria. This study focused on the availability and utilization of instructional material in teaching and learning of Basic Science in selected junior secondary school in Abakaliki education zone of Ebonyi State-Nigeria. The survey research design was used for

the study; population of the study was 92,414. The sample for this study comprised of one hundred students from ten selected junior secondary schools. Structured questionnaire was the instrument used for data collection, and the instrument was face validated by three experts. Three research questions guided the study. The data were analysed using percentages. The result revealed that only two dimensional instructional materials are available in schools. Other instructional materials e.g. Audio materials, Audio-visual materials are lacking in most schools. The study also revealed that teachers do not improvise instructional materials to facilitate their teaching. The researchers therefore recommend that teachers should be given orientations/workshops from time to time on the improvisation and utilization of instructional materials and that the government should also assist in the provision and supply of these instructional materials for use in schools.

Nnadi (2018) carried out his study on, Availability and utilization of instructional materials for the implementation of the new biology curriculum in senior secondary schools in Lagos, Nigeria. According to him, the curriculum innovation is a welcome development, but the major issue is whether the curriculum content will be implemented as planned bearing in mind that adequate instructional materials may either be unavailable or underutilized. This research work seeks to determine whether the available instructional materials and their level of utilization for the teaching of Biology in Senior Secondary Schools in Lagos State, Nigeria, are adequate for effective implementation of the new Biology curriculum. Survey research design, proportionate random sampling, and research instrument like Teachers' Assessment Questionnaire were used. For data analysis, mean, frequency count, chart, and percentages were used. The study revealed that Biology curriculum was not implemented as envisaged.

2.4 Summary of Literature Reviewed

In this chapter, the concepts of instructional materials and competence were highlighted. Also the importance of instructional materials together with Electrical Installation and Maintenance Work Trade as a subject were reviewed. It was established from the literature reviewed that instructional materials are essential and significant tools needed for teaching and learning of Technical Colleges subjects to promote teachers' efficiency and improve students' performance. They make learning more interesting, practical, realistic and appealing. They also enable both the teachers and students to participate actively and effectively in lesson sessions. They give room for acquisition of skills and knowledge and development of self-confidence and self-actualization. The findings of this research tend to bring solution to the assessment of the Teachers competency in the use of instructional materials for teaching Electrical Installation and Maintenance Trade Work (EIMW)

The study therefore deemed it necessary to look specifically into the contributions of instructional materials for teaching Electrical Installation and Maintenance work trade in Technical Colleges in Niger State.

Teaching facilities will therefore, include all forms of information that can be used to promote and encourage effective teaching learning activities. From the above literature review, there is little or no work had been carried out on the Strategies for Enhancing Teachers use of Instructional Materials for Teaching Electrical Installation and Maintenance work (EIMW) in Technical Colleges in Niger State, based on the literature reviewed, therefore this study intent to fill the gap of dearth of literature.

CHAPTER THREE

3.0 METHODOLOGY

This chapter presents a description of the study procedure, in the following order; design, area, population, validation of instrument, data analysis, instrument for data collection, method of data collection and method of data analysis.

3.1 Design of the Study

The study adopted simple survey research design. Best (2017) survey design is used in a situation where the study employs questionnaire to determine opinions, preference, attitude and perception of people about an issue. The design was considered appropriate for this study since it seek the opinions of Electrical Installation and Maintenance Work Trade (EIMW) teachers

in technical colleges in Niger state.

3.2 Area of the Study

The study was carried out in all the technical colleges in Niger state. Niger state is located in the central region of north-central Nigeria, which has a boundary with Abuja, Kogi, Benue, Kwara and Kaduna, Kebbi in northern west part of the country. It laid between the latitude $15^{\circ} 09$ North and longitude $10^{\circ} 5$ central of Nigeria, in Niger state most of the occupational area are: Trading, Farming, Fishing and few Civil Servants. National population census, (2006).

3.3 Population of the Study

The targeted population for this study comprised of 85 respondents from the Electrical Installation and Maintenance Work teachers and students in some selected Technical colleges

S/N	Schools	Number of EIMW Trade Teachers	No of Students
1.	GTC Minna	35	15
2.	GTC Eyagi-Bida	710	
3.	FSTC Kuta	15	3

in Niger state.

3.4. Sample and Sampling Techniques

The sample of the study consist of twenty-eight (28) Trade-Teachers and fifteen (15) students selected by stratified random sampling techniques from the selected three area of study that consisted of three technical colleges in Niger state.

S/N	Schools	Number of EIMW Trade Teachers	No of Students
1.	GTC Minna	10	7
2.	GTC Eyagi, Bida	8	3
3.	FSTC Kuta	10	5
	Total	28	15

Table1: Distribution of the Population

3.5 Instrument for Data Collection

Data collected for this study was structure questionnaire that is designed by the researcher and administered to respondent from technical colleges. The questionnaire contain 21 items in which item 1-8 were associated with, What are the competency need in the use of Instructional Materials for teaching Electrical Installation and Maintenance Work trade (EIMW) in Technical colleges in Niger state, item 9- 16 is on What are the impact of Instructional Materials on teaching Electrical Installation and Maintenance Work trade

(EIMW) in Technical colleges in Niger state, and items 17- 21 is on What are the use of Instructional materials for assessing students of Electrical Installation and Maintenance Work trade (EIMW) in Technical colleges in Niger state, the respondent are require to indicate their opinion in a four-point scale.

Strongly agree(SA) = 4 point

Agree (A) = 3 point

Disagree (D) = 2 point

Stronglydisagree (SD) = 1 point

These are prepared in such a way to enable the respondents tick (√) from the response options relevant to the research questions.

3.6. Validation of Instrument

A draft of the instrument for data collection of this study was validated by three Lecturers from Industrial and Technology Education, Department of Electrical and Electronics Technology Education of Federal University of Technology Minna (FUT Minna) the experts were requested to scrutinize each item of the questionnaire for clarity of statement. They also examined the appropriateness and suitability of all items on the instrument. The suggestions and corrections of the experts were used in modifying the instrument. The validated instrument will then be used for data collection.

3.7Method for Data Collection

The questionnaire was administered to the respondents with the help of three research assistants one from each of the Technical Colleges. The research assistants were given instructions on how to administer the questionnaire. The copies of the questionnaire were collected by the research assistants and the researcher as soon as the respondents finished responding to the questionnaire.

3.8 Method of Data Analysis

The data collected was analysed based on the questionnaire as the research questions was analysed using the frequencies of the answered question from the respondents, which afterwards will be translated into simple mean in a tabular form for an easy interpretation.

Thus, the mean was obtained using the following formula:

$$X = \frac{\sum FX}{N}$$

Where

X = Mean

F = Frequency

X = Normal value of option

N = Number of respondents

$$\frac{4+3+2+1}{4} = \frac{10}{4} = 2.50$$

3.9 Decision Rule

A cut off point of 2.50 was used to determine the mean which was obtained thus: any score equal to or greater than 2.50 was considered as agreed responses while any score less than (<) 2.49 was considered as disagreed response.

CHAPTER FOUR

4.0 DATA ANALYSIS AND PRESENTATION OF RESULTS

This chapter is concern with the presentation analysis and interpretation of collected data which are presented according to each question with cumulative mean score and standard deviation

4.1. Presentation of Results

Research Question 1: What are the Importance of Instructional Materials uses for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state?

Table 1: Mean Score on the Importance of Instructional Materials uses for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state

S/N	Items	\bar{X}	SD	Remark
1	Instructional materials save time, what you will explain in ten minutes, will be possible in less time with the use of instructional materials.	3.46	0.99	Agreed
2	Instructional materials Enhance teaching and learning Electrical Installation and Maintenance work	3.82	0.61	Agreed
3	Make learning more meaningful for students	3.71	0.71	Agreed
4	Instructional materials Help students to learn more	3.57	0.79	Agreed
5	Vitalize instruction and provide variety in teaching	3.46	0.96	Agreed

Table 1 shows the result of the analysis to answer the research questions 1 presented in the table. The result of the data presented above show's that all this items have grand mean value ranging from 3.46 - 3.82, this indicates that the grand mean of each items was above 2.50 which

was the mean cut off point on the four-point rating scale for the importance using instructional materials in teaching. Therefore, this shows that using instructional materials is important in teaching Electrical Installation and Maintenance Work (EIMW)

4.2 Research Question 2: What are the types of Instructional Materials use for teaching Electrical Installation and Maintenance Work trade (EIMW) in Technical colleges in Niger state?

Table 2, Mean Score on types of Instructional Materials use for teaching Electrical Installation and Maintenance Work trade (EIMW) in Technical colleges in Niger state

S/N	Items	\bar{X}	SD	Remark
	Audio and other visual materials: Radio, model, computer, tape recording etc.	3.03	1.23	Agreed
1	Display materials: Chalkboard, bulletin boards, flat pictures, magnet boards and flannel board.	3.5	0.92	Agreed
2	Projected materials: Television, video tape, overhead projector, slides and slide projector and transparencies	3.60	0.95	Agreed
3	Graphic materials: Graphs, charts, diagram, maps, globes.	3.5	0.74	Agreed
4	Printed and reference materials: Textbooks, newspapers, magazines, government documents, teachers' guide, duplicated materials, journals, hand book, bulletins, pictures, work books, pamphlets, and leaflets	3.53	0.92	Agreed

Table 2 shows the result of the analysis to answer the research questions 2 presented in the table. The result of the data presented above show's that all this items have grand mean value

ranging from 3.03 - 3.60, this indicates that the grand mean of each items was above 2.50 which was the mean cut off point on the four-point rating scale for the types of instructional materials use for teaching Electrical Installation and Maintenance Work (EIMW).

4.3 Research Question 3:

What are the Strategies for Enhancing Teachers use of Instructional Materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state?

Table 3, Mean Score on the Strategies for Enhancing Teachers use of Instructional Materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical Colleges in Niger state

S/N	Items	\bar{X}	SD	Remark
1	Before selecting or developing any instructional materials, Electrical Installation and Maintenance work teachers consideration number of teaching/learning situations to which the instructional materials will be applied	3.25	1.10	Agreed
2	The Electrical Installation and Maintenance work content for which the instructional materials are being selected, where in doubt, the teacher should consult	3.25	0.96	Agreed
3	The Electrical Installation and Maintenance work instructional objectives, content learning activities and evaluation instruments should be taken into consideration by the teacher in the utilization of instructional materials	3.03	1.13	Agreed

4	The Electrical Installation and Maintenance work	3.42	0.99	Agreed
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teachers should realize the need for improvisation when the cost of purchasing the instructional materials is high.

5	The teacher should preview the instructional material	3.0	1.18	Agreed
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before they are brought to the class to determine the operational state of the intended instructional material,

Table 3 shows the result of the analysis to answer the research questions 3 presented in the table. The result of the data presented above show's that all this items have grand mean value ranging from 3.0 - 3.42, this indicates that the grand mean of each items was above 2.50 which was the mean cut off point on the four-point rating scale for the strategies for enhancing teachers use of instructional materials in teaching Electrical Installation and Maintenance work (EIMW).

4.4 Research Question 4: What are the Factors Affecting Teachers uses of Instructional materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state?

Table 4, Mean Score on the Factors Affecting Teachers uses of Instructional materials for teaching Electrical Installation and Maintenance Work (EIMW) in Government

S/N	Items	\bar{X}	SD	Remark
Science and Technical colleges in Niger state				
1	Finance is one of the major factors affecting teachers use of instructional materials	3.92	0.26	Agreed
2	Over population of student in the classroom. (Number of learners/students involved)	3.75	0.58	Agreed
3	Community resources, affect the choice of instructional material that can be used. (Facilities and Resources available)	3.10	1.19	Agreed
4	If the school environment is not conducive, it's affecting teachers use of instructional materials	3.28	1.08	Agreed
5	Poor maintenance culture of existing instructional materials especially projected and manipulative types.	3.17	1.02	Agreed

Table 4 shows the result of the analysis to answer the research questions 4 presented in the table. The result of the data presented above show's that all this items have grand mean value ranging from 3.10 - 3.92, this indicates that the grand mean of each items was above 2.50 which was the mean cut off point on the four-point rating scale for the factors affecting Teachers uses of instructional materials for teaching Electrical Installation and Maintenance

work (EIMW). Therefore, this shows that Finance is the major factors affecting teachers uses of instructional materials for teaching Electrical Installation and Maintenance Work (EIMW)

4.5 Research Question 5:

What are the Guide lines for the Selection of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state?

Table 5, Mean Score on the Guide lines for the Selection of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state

S/N	Items	\bar{X}	SD	Remark
1	The teacher should ensure that the instructional materials to be used are easily available	3.60	0.87	Agreed
2	Teacher to ensure that the materials to be used as instructional materials are accessible to him.	3.0	1.08	Agreed
3	The teacher using the instructional materials should ensure the appropriateness of the instructional materials for his intended learners.	3.28	1.01	Agreed
4	The teacher should test the materials and ensure their workability before the actual date of use	3.32	1.05	Agreed
5	The instructional materials selected for teaching by the teacher should be of good quality	2.89	1.13	Disagreed
6	The Electrical Installation teachers should select the instructional materials to the age of the learners	3.46	0.92	Agreed

Table 5 shows the result of the analysis to answer the research questions 5 presented in the table. The result of the data presented above show's that all this items have grand mean value

ranging from 3.0 - 3.89, this indicates that the grand mean of each items was above 2.50 which was the mean cut off point on the four-point rating scale for the Guide line for the selection of instructional materials in teaching Electrical Installation and Maintenance work (EIMW)

4.6 Hypotheses 1

There is no significant difference between the responses of teachers and students with regards to the Importance of Instructional Materials uses for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state.

Table1: T-test analyses regarding the Importance of Instructional Materials uses for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state.

S/N	Items	\overline{SD}	t-test	Remark
1	Instructional materials save time, what you will explain in ten minutes, will be possible in less time with the use of instructional materials.	0.53	0.93	Accepted
2	Instructional materials Enhance teaching and learning Electrical Installation and Maintenance work	0.56	1.43	Accepted
3	Make learning more meaningful for students	0.85	0.93	Accepted
4	Instructional materials Help students to learn more	0.70	0.97	Accepted
5	Vitalize instruction and provide variety in teaching	0.65	0.76	Accepted

The analysis in table reveals that the items 1,2,3,4 and 5 had their calculated t-values range from 0.76 to 1.43. Since calculated t-ratio is below the t-value of 1.69 at 0.05 level of significance. This indicate that there was no significance difference between the mean responses of trade teachers and students with regards to the Importance of Instructional

Materials uses for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state Therefore, this indicates that the null hypothesis is accepted at 0.05 level of significance.

4.7 Hypotheses 2

There is no significant difference between the responses of trade teachers and students with regards to the types of Instructional Materials use for teaching Electrical Installation and Maintenance Work trade (EIMW) in Technical colleges in Niger state.

Table 2: T-test analyses regarding the types of Instructional Materials use for teaching Electrical Installation and Maintenance Work trade (EIMW) in Technical colleges in Niger state

S/N	Items	SD	t-test	Remark
1	Audio and other visual materials: Radio, model, computer, tape recording etc.	1.23	0.28	Accepted
2	Display materials: Chalkboard, bulletin boards, flat pictures, magnet boards and flannel board.	0.92	0.92	Accepted
3	Projected materials: Television, video tape, overhead projector, slides and slide projector and transparencies	0.95	-1.36	Accepted
4	Graphic materials: Graphs, charts, diagram, maps, globes.	0.74	-0.48	Accepted
5	Printed and reference materials: Textbooks, newspapers, magazines, government documents, teachers' guide, duplicated materials, journals, hand book, bulletins, pictures, work books, pamphlets, and leaflets	0.92	-1.34	Accepted

The analysis in table reveals that the items 1,2,3,4 and 5 had their calculated t-values ranges from -0.48 to 0.92. Since calculated t-ratio is below the t-value of 1.69 at 0.05 level of significance. This indicates that there was no significant difference between the mean responses of trade teacher and students with regards to the types of Instructional Materials use for teaching Electrical Installation and Maintenance Work trade (EIMW) in Technical colleges in Niger state. Therefore, the null hypothesis is accepted at 0.05 level of significance.

4.8 Hypotheses 3

There is no significant difference between the responses of trade teachers and students with regards to the Strategies for Enhancing Teachers use of Instructional Materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical Colleges in Niger state

Table 3: T-test analyses regarding the Strategies for Enhancing Teachers use of Instructional Materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical Colleges in Niger state

S/N	Items	SD	t-test	Remark
1	Before selecting or developing any instructional materials, Electrical Installation and Maintenance work teachers consideration number of teaching/learning situations to which the instructional materials will be applied	0.78	1.19	Accepted
2	The Electrical Installation and Maintenance work content for which the instructional materials are being selected, where in doubt, the teacher should consult	0.48	0.87	Accepted
3	The Electrical Installation and Maintenance work	0.74	1.11	Accepted

instructional objectives, content learning activities and evaluation instruments should be taken into consideration by the teacher in the utilization of instructional materials

- | | | | | |
|---|---|------|------|----------|
| 4 | The Electrical Installation and Maintenance work | 0.60 | 0.58 | Accepted |
| teachers should realize the need for improvisation when the cost of purchasing the instructional materials is high. | | | | |
| 5 | The teacher should preview the instructional material | 0.78 | 0.50 | Accepted |
| before they are brought to the class to determine the operational state of the intended instructional material, | | | | |

The analysis in table reveals that the items 1,2,3,4 and 5 had their calculated t-values ranges from 0.50 to 1.19 Since calculated t-ratio is below the t-value of 1.69 at 0.05 level of significance. This indicate that there was no significance difference between the mean responses of trade teachers and students with regards to the Strategies for Enhancing Teachers use of Instructional Materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical Colleges in Niger state.

Therefore, the null hypothesis is accepted at 0.05 level of significance.

4.9 Hypotheses 4

There is no significant difference between the responses of trade teachers and students with regards to the Factors Affecting Teachers uses of Instructional materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state.

Table 4: T-test analyses regarding the Factors Affecting Teachers uses of Instructional materials for teaching Electrical Installation and Maintenance Work (EIMW) in Government Science and Technical colleges in Niger state.

S/N	Items	SD	t-test	Remark
1	Finance is one of the major factors affecting teachers use of instructional materials	0.92	0.46	Accepted
2	Over population of student in the classroom. (Number of learners/students involved)	0.75	0.58	Accepted
3	Community resources, affect the choice of instructional material that can be used. (Facilities and Resources available)	0.50	1.09	Accepted
4	If the school environment is not conducive, it's affecting teachers use of instructional materials	0.48	1.08	Accepted
5	Poor maintenance culture of existing instructional materials especially projected and manipulative types.	0.57	1.02	Accepted

The analysis in table reveals that the items 1,2,3,4 and 5 had their calculated t-values ranges from 0.46 to 1.09. Since calculated t-ratio is below the t-value of 1.69 at 0.05 level of significance. This indicates there was no significant difference between the mean responses of trade teachers and students with regards to the Factors Affecting Teachers uses of Instructional materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state. Therefore, the null hypothesis is accepted at 0.05 level of significance.

4.9.1 Hypotheses 5

There is no significant difference between the responses of trade teachers and students with regards to the Guide lines for the Selection of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state

Table 5: T-test analyses regarding the Guide lines for the Selection of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state

S/N	Items	<i>SD</i>	t-test	Remark
1	The teacher should ensure that the instructional materials to be used are easily available	0.60	0.87	Accepted
2	Teacher to ensure that the materials to be used as instructional materials are accessible to him.	0.58	1.08	Accepted
3	The teacher using the instructional materials should ensure the appropriateness of the instructional materials for his intended learners.	0.48	1.01	Accepted
4	The teacher should test the materials and ensure their workability before the actual date of use	0.32	1.05	Accepted
5	The instructional materials selected for teaching by the teacher should be of good quality	0.89	1.13	Accepted
6	The Electrical Installation teachers should select the instructional materials to the age of the learners	0.46	0.92	Accepted

The analysis in table reveals that the items 1,2,3,4,5 and 6 had their calculated t-values ranges from 0.87 to 1.13 Since calculated t-ratio is below the t-value of 1.69 at 0.05 level of significance. This indicate that there was no significance difference between the mean responses of trade teachers and students with regards to the Guide line for the selection of instructional materials in teaching Electrical Installation and Maintenance work (EIMW). Therefore, the null hypothesis is accepted at 0.05 level of significance.

4.9.2 Findings of the Study

The following are the findings of the study presented based on the Purpose:

1. Importance of Instructional Materials being use for teaching Electrical Installation
 - i. Instructional materials Enhance teaching and learning Electrical Installation and Maintenance work
 - ii. Make learning more meaningful for students
 - iii. Instructional materials Help students to learn more and Maintenance work (EIMW) in Technical Colleges in Niger State.
2. Types of Instructional Materials use for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state
 - i. Audio and other visual materials: Radio, model, computer, tape recording etc.
 - ii. Display materials: Chalkboard, bulletin boards, flat pictures, magnet boards and flannel board.
 - iii. Projected materials: Television, video tape, overhead projector, slides and slide projector and transparencies
3. Strategies for Enhancing Teachers use of Instructional Materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state.
 - i. Before selecting or developing any instructional materials, Electrical Installation and Maintenance work teachers' consideration number of teaching/learning situations to which the instructional materials will be applied
 - ii. The Electrical Installation and Maintenance work content for which the instructional materials are being selected, where in doubt, the teacher should consult.
 - iii. The Electrical Installation and Maintenance work instructional objectives, content learning activities and evaluation instruments should be taken into consideration by the teacher in the utilization of instructional materials

4. Factors Affecting Teachers use of Instructional materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state.
 - i. Finance is one of the major factors affecting teachers use of instructional materials
 - ii. Over population of student in the classroom. (Number of learners/students involved)
 - iii. Community resources, affect the choice of instructional material that can be used.
(Facilities and Resources available)

5. Factors Guiding the Selection of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state
 - i. The teacher should ensure that the instructional materials to be used are easily available
 - ii. Teacher to ensure that the materials to be used as instructional materials are accessible to him.
 - iii. The teacher using the instructional materials should ensure the appropriateness of the instructional materials for his intended learners.

4.9.3 Discussion of Finding

The study examines the Strategies for Enhancing Teachers use of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical Colleges in Niger state. The study revealed the Importance of Instructional Materials uses for Teaching Electrical Installation and Maintenance Work (EIMW) the instructional material it is very important for teaching, Bajah, (2015) pointed out the important of instructional materials include; Instructional materials save time, what you will explain in ten minutes, will be possible in less time with the use of instructional materials, Instructional materials Enhance

teaching and learning Electrical Installation and Maintenance work, and Make learning more meaningful for students,

Table 2 of the study revealed the types of Instructional Materials use for teaching Electrical Installation and Maintenance Work. Yusuf (2015) classified types of instructional material as follows: -Printed and reference materials: Textbooks, newspapers, magazines, government documents, teachers' guide, duplicated materials, journals, hand book, bulletins, pictures, work books, pamphlets, and leaflets, Graphic materials: Graphs, charts, diagram, maps, globes. Display materials: Chalkboard, bulletin boards, flat pictures, magnet boards and flannel board. Projected materials: Television, video tape, overhead projector, slides and slide projector and transparencies. Audio and other visual materials: Radio, model, computer, tape recording.

The study reveal that the professional electronics teacher needs to note that every instructional material has its definite unique strength in teaching-learning situation. Furthermore, better teaching and faster learning of electronics principles can be facilitated by careful selection, development and skilful utilization of appropriate instructional materials by the competent teachers. Based on the foregoing, the following strategies are suggested to enhance the teachers' competence in the selection, development and utilization of instructional materials for effective instruction delivery: i. Develop positive attitude towards the development and use of instructional materials in instructional delivery in schools. ii. The instructional objectives, content learning activities and evaluation instruments should be taken into consideration by the teacher in the selection, development and utilization of instructional materials. In other words, maintain appropriateness of the materials to instructional objectives.

The finding of the study shows the factors that Affecting Teachers uses of Instructional materials for teaching Electrical Installation and Maintenance Work (EIMW), Bakare (2016) outlined the following factors:

Nature of the subject matter and the objectives to be attained, Number of learners/students involved, the space of time available, Facilities and materials available. Teachers have been found to have difficulties in selecting and using instructional materials for teaching. Part of the difficulties has been that teachers tend to teach the way they were taught in their training (NERCD, 2017). Consequently, teachers use the materials they were exposed to during their training. This habit is often difficult for teachers to change. Other reasons advanced for the inability of teachers to use instructional resources effectively include: Inability to identify/locate resources, Inability to develop appropriate materials from local resources; Lack of school- based resource Centre.

The finding shows that the teacher who wants to use instructional materials should consider the following variables to guide him in the selection of the types to be used in the teaching learning exercise:

Availability: The teacher should ensure that the instructional materials to be used are easily available for use before the date of use.

Affordability: The instructional materials to be used should not be expensive the cost should be such that either the teacher or the school can afford. **Qualitative:** The instructional materials selected for teaching by the teacher should be of good quality. **Simplicity:** The instructional materials to be used should be simple to operate or manipulate. **Suitability:** The teacher using the instructional materials should ensure the appropriateness of the materials for his intended learners.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter deals with Summary, conclusion, recommendation and suggestion for further studies

5.1. Summary

The study was carried out on the Study on Strategies for Enhancing Teachers use of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical Colleges in Niger state. The study comprises of five chapters. Chapter one consists of Background of the study, Statement of the problem, purpose of the study, Research Questions, Significance of the study as well as Scope of the study. The chapter two aspect of the research work deals with the review of related literature. The chapter three deals with the aspect of the research work consists of Research Design, Area of the study, population of the study, sample and Sampling Techniques, Instrument for Data Collection, Validation of Research Instrument, Method of Data Collection as well as Method of Data Analysis. The chapter four of the study deals with data analysis and presentation of the result and the data collected was analysed and presented in tabular form based on research questions. Finally, the chapter five deals with the summary, discussion of findings, conclusion, and recommendations, suggestions for further studies.

5.2 Conclusion

Instructional materials are wide varieties of equipment and materials use for teaching and learning by teachers to stimulate self-activity on the part of the students. The teaching of Electrical Installation without instructional materials may certainly result in poor academic achievement. It is on this note that the essay explore/studies.

5.3 Implication of the Study

The aim of this study was to examine the study on Strategies for Enhancing Teachers use of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical Colleges in Niger state. It can be seen that students taught with instructional materials performed better than those taught without. This shows that students learn and

perform better when they are taught with instructional materials because the use of instructional materials gives the students the opportunity to see, feel and touch the materials during teaching. The government and school authorities should encourage the Technical teachers to improvise those instructional materials that are not available in their workshops by providing the teachers with money to buy some of the tools and equipment’

5.4 Contribution to knowledge

In the course of carried out this research study, the search work has immensely help or contributed the researcher knowledge on how to carry out a research work in order to determine a possible solution. Another area in which contributed to the knowledge of the researcher and the technical colleges in Niger state, trade teachers teaching electrical installation and maintenance work (EIMW) in technical colleges in Niger state. It also revealed the strategies for enhancing teachers used instructional materials in teaching electrical installation and maintenance work in technical colleges in Niger state and nation at large. The research helped the teachers as they have identified their own weakness in teaching and learning of Electrical installation and maintenance work (EIMW) technology and improve in such areas. Another area in which contributed to the knowledge of the researcher and the technical colleges is that it has help the curriculum planners in National Board for Technical Education to integrate identified reliability centred maintenance work skills into the curriculum of electrical installation maintenance work in Technical Colleges.

5.5 Recommendations

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

1. Trainings should be organized for teachers so they could update their skills for effective use of instructional facilities in Electrical Installation and Maintenance work in Government Science and Technical College in Niger State

2. Workshops and seminars should be organized on the importance and benefits of using instructional facilities for Teaching Electrical Installation and Maintenance Work.
3. Heads of Trade should carryout regular supervision during practical hours to ensure the effective utilization of instructional facilities for Teaching Electrical Installation.
4. Government should provide instructional materials in Technical College's to enhance effective teaching and learning
5. Teachers and students should be encouraged to form the habit of improvising instructional materials to make up the shortfall in supply.

5.6.Suggestions for Further Study

It is suggested that further studies be carried out on strategies of maintaining Electrical/Electronic facilities, tools and equipments in technical colleges in Niger state.

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APPENDIX I

QUESTIONNAIRE

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION

QUESTIONNAIRE ON THE

EXPOSE STRATEGIES FOR ENCHANCING TEACHERS USE OF INSTRUCTIONAL MATERIALS FOR TEACHING ELECTRICAL AND MAINTENANCE WORK IN TECHNICAL COLLEGES IN NIGER STATE.

Instruction

These questionnaires consist of section A and B. Section A deals with personal data, and section B deals with questionnaire items all are structured in form of close ended questions. Read each question carefully and answer by ticking (√) response that best suits your opinion

Keys:

Strongly Agree (SA) Agree (A) Strongly Disagree = (SD) Disagree = (D)

Section “I” Personal Data

Gender: Male [] Female []

Working Experience: 0 – 5years [], 6 – 10years [], 11 – 15years [], 16 – 20years []
21 – 30years []

Section “II” Questionnaires Items

SECTION A:

Research Question 1: What are the Importance of Instructional Materials uses for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state?

S/N	Items	SA	A	SD	D
1	Instructional materials save time, what you will explain in ten minutes, will be possible in less time with the use of instructional materials.				
2	Instructional materials Enhance teaching and learning Electrical Installation and Maintenance work				
3	Make learning more meaningful for students				
4	Instructional materials Help students to learn more				
5	Vitalize instruction and provide variety in teaching				

SECTION B:

Research Question 2: What are the types of Instructional Materials use for teaching Electrical Installation and Maintenance Work trade (EIMW) in Technical colleges in Niger state?

S/N	Items	S	A	SD	D
1	Audio and other visual materials: Radio, model, computer, tape recording etc.				
2	Display materials: Chalkboard, bulletin boards, flat pictures, magnet boards and flannel board.				
3	Projected materials: Television, video tape, overhead projector, slides and slide projector and transparencies				
4	Graphic materials: Graphs, charts, diagram, maps, globes.				
5	Printed and reference materials: Textbooks, newspapers, magazines, government documents, teachers" guide, duplicated materials, journals, hand book, bulletins, pictures, work books, pamphlets, and leaflets				

SECTION C:

Research Question 3: What are the Strategies for Enhancing Teachers use of Instructional Materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state?

S/N	Items	S	A	SD	D
1	Before selecting or developing any instructional materials, Electrical Installation and Maintenance work teachers consideration number of teaching/learning situations to which the instructional materials will be applied				
2	The Electrical Installation and Maintenance work content for which the instructional materials are being selected, where in doubt, the teacher should consult				
3	The Electrical Installation and Maintenance work instructional objectives, content learning activities and evaluation instruments should be taken into consideration by the teacher in the utilization of instructional materials				
4	The Electrical Installation and Maintenance work teachers should realize the need for improvisation when the cost of purchasing the instructional materials is high.				

5	The teacher should preview the instructional material before they are brought to the class to determine the operational state of the intended instructional material,				
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SECTION D:

Research Question 4: What are the Factors Affecting Teachers uses of Instructional materials for teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state?

S/N	Items	S A	A	SD	D
1	Finance is one of the major factors affecting teachers use of instructional materials				
2	Over population of student in the classroom. (Number of learners/students involved)				
3	Community resources, affect the choice of instructional material that can be used. (Facilities and Resources available)				
4	If the school environment is not conducive, it affecting teachers use of instructional materials				
5	Poor maintenance culture of existing instructional materials especially projected and manipulative types.				

SECTION E:

Research Question 5: What are the Guide lines for the Selection of Instructional Materials for Teaching Electrical Installation and Maintenance Work (EIMW) in Technical colleges in Niger state?

S/N	Items	S A	A	SD	D
1	The teacher should ensure that the instructional materials to be used are easily available				
2	teacher to ensure that the materials to be used as instructional materials are accessible to him.				
3	The teacher using the instructional materials should ensure the appropriateness of the instructional materials for his intended learners.				
4	The teacher should test the materials and ensure their workability before the actual date of use				
5	The instructional materials selected for teaching by the teacher should be of good quality				
6	The Electrical Installation teachers should select the instructional materials to the age of the learners				