COMPETENCY SKILLS LEVEL POSSESSED BY BLOCK/BRICKLAYING AND CONCRETING STUDENTS IN TECHNICAL COLLEGES IN NIGER STATE

BY

HARUNA, Usman Kawo
2014/1/50096TI

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

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A RESEARCH PROJECT SUBMITTED TO THE
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DECLARATION

I, **HARUNA, Usman Kawo** with matric number 2014/1/50096TI an undergraduate student of the Department of Industrial and Technology Education certify that the work embodied in this project is original and has not been submitted in part or full for any other diploma or degree of this or any other university.

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HARUNA, Usman Kawo **Date**
2014/1/50096TI

CERTIFICATION

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

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Dr. A.M. Hassan **Date**
Project Supervisor

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Dr. I.Y. Umar **Date**
Head of Department

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External Supervisor **Date**

DEDICATION

Alhamdullilah, this project work is dedicated to my late father **Alhaji Haruna Abdu Kawo**, and my mother **Hajiya Fatimah Haruna Kawo**for their words of guidance and encouragement made me to achieve lots of success in life..

Secondly I would also like to dedicate the entire work to my one and only partner in crime, my confider and my most treasured gift from the most high, my daughter **RuqayyahKawo Usman (Raeesah),** and to my late son **Abubakar Kawo Usman (Babba).**

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ABSTRACT

This study aim to assess competency in practical skills required bybuilding technology students of block/bricklaying and concreting students in technical colleges in Niger State. Descriptive survey research method was used. The study was carried out in Niger State. The population for the study comprises of Block/Bricklaying and Concreting teachers and students of block/bricklaying and concreting in six (6) technical collegesin Niger State. Stratified random sampling was used. 70 persons were sampled out from the entire population consisting of 60 students and 10 teachers of block/bricklaying and concreting. The instrument for data collection was structured questionnaire developed by the researcher. The instrument for data collection was validated by three lecturers from the Department of Industrial Technology and Education. The questionnaire was the main instrument used by the researcher for this study. The research questions was answered using mean and standard deviation while t-test will be used to test the null hypotheses at 0.05 level of significance. From the findings, it revealed that the competency skills level possessed in blocklaying bricklaying work students of bricklaying department have most of the facilities in their workshop, and classes which includes, Instructional material , such as drawing board, Drawing paper, Pencil, Set square , Ruler, Eraser, T-square, protractors also revealed that the students were not expose to field trip, project method. Based on the findings of the study: It was discovered that students of Blocklaying Bricklaying and Concreting skills required in their trade, and teachers of building technology employ various teaching methods to inculcate practical skills students in their trade. The following recommendationswere proffered; the job related tasks determined should be integrated to the curriculum of buildingtechnology of technical colleges in Nigeria and Qualified and well-grounded teachers of block/bricklaying and concreting should be employedfor teaching in technical colleges among others

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

The survival of any industry is largely dependent on the caliber of its available craftsmen and technicians. For any building industry to perform its duties and remain in production, it would require the services of building technology craftsmen. Building technology craftsmen are expected to execute the jobs/tasks involved in the building construction industry. However, studies have shown that graduates of blocklayng/bricklaying and concreting trade (BBC) at the technical college level who are meant to serve as manpower in applied science and technology have failed society.

Block laying/Bricklaying and Concreting trade according to the Federal Government of Nigeria's National Policy on Education (2012) is one of the industrial technical courses offered in technical colleges, it equips individuals with the knowledge and skills required for technological advancement. BBC widens the intellectual horizon of the individual in the field of construction as well as equips them with skills that are necessary for their enterprising. Block laying, Bricklaying, and Concreting involve skill acquisition in building drawing, site organization, and layout, clearing, leveling and setting out, excavation, foundations, walls, roofs, ceilings, services, drainage, finishes, external works among others (Anaele, 2009). The importance of BBC cannot be over-emphasized since this field of study represents core indices of national development. Odu (2011) stated that the major distinction between an advanced country and a developing one is to a large measure the differences between their levels of scientific and technical education, building technology inclusive. Due to the importance, the Federal Government of Nigeria (2010)

included it into the technical college curriculum as a course. Technical colleges provide students through training with the relevant and adequate knowledge, skills, and attitudes for employment under the guidelines of a teacher in related occupations. Technical colleges according to Okoro (2013) are the principal vocational institutions in Nigeria that give full training that prepares students for entry into various occupations. The primary objective of technical colleges is to produce graduates who will either take up job opportunities or be self-employed (FRN, 2014). It is further stated in the National Policy on Education that technical colleges train students in carpentry and joinery, upholstery, furniture making, welding and fabrication, air conditioning and refrigeration, foundry, mechanical engineering craft practice, plumbing and pipefitting, radio, television, and electrical work, electrical installation and block laying/ bricklaying and concreting.

Block/bricklaying and concreting are offered at both intermediate and advanced levels in technical colleges. The curriculum of intermediate block/bricklaying and concrete in addition to general education subjects such as Mathematics, English Language, Physics, Chemistry, and Social Studies has the core trade subjects to include Introduction to Building Construction, Block laying, Bricklaying, Concreting, Land Surveying, Quantity Surveying, Technical Drawing, Building Drawing, and Construction Management. Block/Bricklaying and Concreting is concerned with developing positive attitudes required to perform effectively in the industry or workplace and emphasizing the importance of quality and quantity concerning performing the duties of the occupation (National Board for Technical Education, 2010).

According to the Federal Republic of Nigeria (FRN 2011), the objectives of vocational and technical education are to provide trained manpower in the applied science and technology, commerce particularly at sub-professional craft advance, craft and technical levels provide the

technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development and to give training and impart the necessary skills leading to the production of craftsmen or technician who shall be enterprising and self-reliant economically.

Technician education has part of the total experience whereby he/she learns successfully, how to carry on a gainful occupation which involves the development of skills, knowledge, and attitudes which is required for success in the occupation. Vocational technical education training is practice under the following sub-section, pro-vocational, Vocational, Technical College, College of Education (Technical), Polytechnics, and Universities. Technical colleges are concerned with the teaching of the subject that leads to the acquisition of practical as well as basic scientific knowledge, the colleges are established for satisfying community, state, and the country's needs in terms of training and educating the younger ones in various trade and to make them self-reliant. Technical colleges provide technical and vocational training for quite a several occupations including building technology, woodwork, auto-mechanical, metalwork agriculture mechanizes, radio and television servicing, electrical installation work, telecommunication technician, printing, and others. They offer subjects like electrical/electronics, technical drawing, woodwork, auto mechanics, block laying and concreting, in their trade course. The general subject they offered is mathematics, English language, physics, chemistry, economics, computer technology, technical drawing.

National Policy on Education (2009) made the production of craftsmen, artisans, and other sub-professionals skilled personnel the trainees completing technical college programs shall have three options, secured employment either at the end of the whole course or after completing one or more modules of employable skill, set up their own business and become self-employed and be able to employ other and pursue further education in advance craft/technical program and a

post-secondary (tertiary) technical institution such as science and technical colleges, polytechnics or colleges of education (technical) and universities. According to Okorie (2012), a technical college in Nigeria is established to prepare an individual to acquire practical skills and basic scientific knowledge. It is charged with the production of skilled personnel in the area of mechanical technology, metalwork, electrical/electronic technology, woodwork and block laying, bricklaying, and concreting for the needs of society.

Trades in technical colleges are grouped into four areas indicating their relationship. The four major groupings are Engineering Craft, Communication Craft, Miscellaneous Craft, and Business Studies (NABTEB, 2009, Oranu 2010). The construction craft was further sub-divided into building technology which includes, Brick/Block laying and Concreting (BBC), Carpentry/Joinery (C/J), Plumbing and Pipe Fitting (PPF), and Painting/Decorating (PID). Others are Woodwork trades which include, Furniture making and Machine woodworking. The new curriculum was also designed to bridge the gap between theory and practical skills. The previous curriculum emphasized theory to the detriment of practical in the trades (Aina, 2000). This probably led to the production at the craft level of technical college graduates who are extremely weak in the practice of their trades (Oranu, 2010). Following the adoption of the NABTEB curriculum for technical college's programs, new concepts and distinct trade-related and component subjects were introduced in Brick/block laying and concreting trade.

In Block/Brick Laying and Concreting, there are topics in the trade subjects aimed at studying technical competencies, students are also expected to pass all the trade-related and component subjects before they are awarded the National Technical Certificate (NTC) (NABTEB, 2008). It is therefore important that students are taught these subjects to enable them to progress academically or be self-reliant after graduation.

Block laying/bricklaying and concreting are some of the vocational programs offered in technical colleges. To give training and impart the necessary knowledge and skills leading to the production of craftsmen, technicians, and other skilled personnel who will be enterprising and self-reliant. Entry qualification candidate must not be less than 14 years of age and should have completed three years of Junior Secondary education or its equivalent. Special consideration may be given to sponsored candidates with lower academic qualifications who hold trade test certificates and are capable of benefiting from the program, curriculum table (NTC) for program National Technical Certificate in block laying/bricklaying and concreting. It is designed to produce building technicians among others for the construction/building industry will use tools, equipment, and machines to mold blocks, carry out preliminary site operations, concreting, block wall construction, and finishing in the building industry. In building technology according to Odu (2007) students learn building construction, block/bricklaying, and technical drawing, for building, construction management, surveying, and quantity surveying.

The curriculum of block laying/bricklaying and concreting according to the National Board for Technical Education (NBTEB). This initiative aims to increase the technological growth of the country and to allow students to acquire more practical skills. Despite the Federal Government's emphasis on improving technology, building technology students in technical colleges still find it difficult to acquire building skills that make them functional in society after graduation. Students of building technology graduate with little or no building skills at all to enable them to work in building industries or firms or to be self-employed. These students need necessary building practical skills to take up a job in building industries that are now springing up here and there (Okoro, 2006).

Skills are needed to service the sophisticated technical equipment that is now being improved in the country (Aliozor, 2004). The acquisition of saleable skills is the answer to unemployment among the youths. Erewani (2004) explained that the level of unemployment in a state is indicative of the quality and quantity of manpower available. Nzeagu (2007) also stated that the main cause of unemployment among school levers is lack of training and skill. To reduce unemployment among building students of technical colleges after graduation and for them to contribute their quota to the development of the state. Building practical skills need to be taught by technical teachers, modern building technology tools and equipment for teaching relevant skills in the building must be readily available, also good teaching strategies must be used to teach building subject to the students, and correct evaluation strategies are to be applied to evaluate students' performance both with and outside school. Without acquiring building practice skills, students of building technology can never be functional in society. Building skills are teachable skills. They can only be acquired when relevant materials, tools, and equipment are available for teaching. Relevant tools and equipment enhance the practice teaching and learning process. The quality of instructions offered to the students depends on the teaching strategies employed. The process of offering quality instruction to students involves the use of necessary and modern tools, equipment and machines, material, and complex methods of work. This now demands skilled graduates to be involved in building technology practice in the state. Hence, it is imperative to determine strategies for improving skills acquisition of block laying, bricklaying, and concreting students in technical colleges that will enable them to function effectively in Niger State.

1.2 Statement of the Problem

The Federal Government of Nigeria in the National Policy on Education (2004) enlisted Block/Bricklaying and Concreting as one of the building trades offered in technical colleges. Block/Bricklaying and Concreting is aimed at imparting skills leading to the production of craftsmen, technicians, and other skilled personnel who will be enterprising and self-reliant. The craftsmen should either take up job opportunities in industries or be self-employed (NBTE, 2008). The job opportunities in building industries are not filled up because the graduates are not competent enough to take up the available skilled jobs. In other words block/bricklaying and concreting, graduates are weak in the practice of their trades.

Technical colleges are mainly established for the training of students to acquire practical skills, knowledge, and attitudes essential for employment in a given occupation. Aina (2011) reported the problem of inadequate buildings, tools, and equipment in block laying/bricklaying and concreting in technical colleges, which has resulted in the inability to acquire practical skills in block laying, bricklaying, and concreting students as designed by Technical Education in Nigeria.

Mashegu (2012) opined that the product of brick/block laying and concreting from Nigeria technical college is not like his counterparts elsewhere. If the situation is left as it is, more unqualified competent block laying/ bricklaying and concreting graduates will be produced year in year out. However, If the situation is addressed it will lead to the production of competent skilled graduates that will contribute to the economic and technological development of the nation. It is upon this background the researcher assessed, practical skills of block laying/bricklaying and concreting students in a technical college in Niger State.

1.3 Purpose of the Study

The major purpose of the study is to assess competency in practical skills required by building technology students of block/bricklaying and concreting in technical colleges in Niger State. Specifically, the study sought to determine

1. The competency skills level possessed in brick/block laying work during practical classes in technical colleges in Niger State.
2. The competency skills level possessed in concreting work during practical classes in technical colleges Niger State.
3. The competency skills level possessed in the use of hand tools during practical classes in technical colleges in Niger State.

1.4 Significance of the Study

The findings of the study will be of benefit to building industries, curriculum planners, teachers, students, ministries of education, and society. Building industries where Block/Bricklaying and Concreting graduates seek employment upon graduation will benefit from the findings of this study. If the findings of the study is been incorporated into the curriculum, the graduates will be better equipped with practical skills to perform more effectively in their various jobs and assignments in the industries. This will also help the industry minimize the huge financial expenditure in retraining technical college graduates upon employment.

The findings of this study will be beneficial to curriculum planners. It would highlight the job-related tasks required by Block/Bricklaying and Concreting students, such tasks will be if incorporated into the technical college curriculum to provide the kind of manpower needed for the technological, industrial, and economic development of the country. The identified tasks can be used to train block/bricklaying and concreting teachers. When teachers lay hands on the materials, the findings can be used for personal improvement and to teach his/her students.

Students will benefit from the findings of this study when on-site job-related tasks are incorporated into the curriculum, the tasks will be used to train the students. These competencies will enable students to equip themselves with saleable skills after graduation. They can either pick up a job in building industries or be self-reliant. The findings of this study will be beneficial to ministries of education. They can use the result of the study to devise means of assisting both teachers and students by providing facilities for effective teaching of Block laying/Bricklaying and Concreting to improve practical skills. The findings of the study will serve as a source of information on teacher training needs. The ministries can then help in training the teachers.

The study will benefit teachers of building technology in the following ways. It will help to build technology teachers to teach those saleable building technology skills that may enhance the student's performance after graduation. The teachers will use the identified strategies for improving skill acquisition of building technology students to teach the students thereby reducing unnecessary stress. The teachers of building technology in collaboration with school administrators will use the evaluation strategies determined by this study to evaluate the student's performance both within and outside school. These findings will benefit teachers of technology to give appropriate instruction, knowledge skills to the student of a technical college to be able to do the study mastery and utilization of systematic application of knowledge to practical tasks in

industries. This will be gainful for self-reliance and competence in industries and technological growth and development with a better approach. The finding of this research study will enable teachers of technology to obtain training to acquire the necessary skills and competence to deliver the correct impartation of knowledge to building technology students of technical colleges. The findings of this study will be of benefit to the students of building technology. If the findings of this study are properly implemented, the students of building technology will graduate with enough saleable skills that make them be self-employed or work in the building industries. Building technology tools and equipment to establish their own business will be known to them, thereby reducing unemployment among students after graduation.

Communities will also benefit from the findings of the study in the following ways: if the findings are properly implemented, the result will be that students of building technology will begin to establish building outfits for themselves and thereby developing the area. As the business grows they create job opportunities for others to be employed. The finding of this study if properly implemented will benefit building industries. Building industries will have enough skilled personnel who possess relevant building skills that can make them excel and face challenges in their workplace. The study will also help to build industries to have enough skilled technicians to take care of their work needs.

The findings of this study will provide useful information to the government, the school management board, especially, National Board for Technical Education, curriculum planners on the strategies for improving skill acquisition. The identified strategies will be integrated into the building technology's curriculum to teach students. The findings of this study will also serve as a source of information to research.

1.5 Scope of the Study

The research work on the assessment of competency skills level possessed for (block laying, bricklaying, and concreting) BBC students in technical colleges. The scope of the study is delimited to identify the competency skills level possessed by the block laying, bricklaying, and concreting students, method of teaching and learning BBC practical skills, and the facilities used in teaching and learning BBC practical skills in technical colleges of Niger State. Other institutions offering similar courses will not be covered because of financial constraints and time factors.

1.6 Research Questions

The following research questions guided the study to seek the answers;

1. What are the competency skills level possessed in block laying /bricklaying work during practical classes in technical colleges in Niger State?
2. What are the competency skills level possessed in concreting work during practical classes in technical colleges in Niger State?
3. What are the competency skills level possessed in the use of hand tools during practical classes in technical colleges in Niger State?

1.7 Hypotheses

The following null hypotheses were formulated to guide the study and were tested at a 0.05 level of significance:

HO1: There will be no significant difference between the mean response of BBC teachers and students on the competency skills level possessed by students on block laying/bricklaying work during practical classes in technical colleges in Niger State.

HO2: There will be no significant difference in the mean responses of BBC teachers and students on competency skills level possessed by students on concreting work during practical class in technical colleges in Niger State.

HO3: There will be no significant difference in the mean responses of BBC teachers and students on competency skills level possessed by students on the uses of hand tools during practical classes in technical colleges in Niger State.

CHAPTER TWO

2.1 Theoretical Framework

This study was based on the theoretical framework of competency theory which deals with the transposition of competency and learning.

2.1.1 Competency Theory

Competency theory propounded by Azemikhah (2005) states that "At the point of transposition, the learner can apply performance criteria to new problems or cases independently'. The learner is now able to examine new cases, identify, and study new concepts, if any, and using his/her acquired skills to solve the problem independently. At that point, the learner is deemed competent and the relationship of 'learning to competency' is transposed into 'competency to learning'. When competency and learning are transposed, the learner moves from the 'Not yet Competent' position to the 'Competent' position. The learner's level of competency and professionalism elevates to a point where it can take care of his/her learning.

At the point of transposition of the competency and learning, the learner becomes self-sufficient to learn independently of the facilitator when confronted with new cases or concepts within the precincts or boundaries of the unit of competency. At the point of transposition, the learner

enters into the new stage or cycle of learning where the learning depends entirely on the learner's competency and thus learning becomes the function of the competency itself." (Azemikhah, 2005b). This is also related to the theory of competence propounded by Gilbert (1996).

Gilbert's theory of competence states that 'Knowledge must come through action'. There are two elements in performance: the behavior/activity and the outcome or accomplishment. For example, the delivery of training has an activity component (presenting or facilitating) and an outcome (participant learning). For training to support improvements in learner performance, it needs to connect with the learner's experiences and current activities in a way that promotes the transfer of learning. It is related to competence in that competency-based training is a structured approach to training and assessment that is directed toward achieving specific outcomes. It is about assisting individuals to acquire skills and knowledge so they can perform a task to a specified standard under certain conditions.

Also, the theory explains the gradual process of mastering competencies which are in form of transposition of competence to another one which is what this study is all about. The teachers continue to teach electronics devices, electronic circuits, radio communication, and television system until the students master the competencies and use them to pass the NABTEB examination, proceed to higher education, or become employed or employ others as a result of the mastery of the acquired skills and knowledge.

2.1.2 Theory of Needs

The theory of needs was propounded by Good and Brophy (2007). The theory stated that "A need develops and motivates behaviors only if an individual is exposed to a certain pressure

which needs to be assessed; the desire to satisfy or gratify these needs directs or dictates human behavior". Some individual theorists have made greater inputs with their conceptual scheme motivation which implies classroom teachers. Reisebry (2009) has noted that personality development can be described as a combination of skill and a need. According to Reisebery, each theme in individual life is characterized by the existence of a need concerning a particular press, a stimulus situation that has a potential influence upon the life of the organism.

Abraham Maslow developed the hierarchy of needs in 1940 and the hierarchy of need theory remains valid today for understanding human motivation, management training, and personal development. Indeed, Maslow's ideas surrounding the hierarchy of needs concerning the responsibility of employers to provide a workplace environment that enables employees to fulfill their unique potential (self-actualization) are today more relevant than ever.

In his view, Cannon (2000) saw need gratification as the basis for human behaviors. He commended that needs are arranged in a hierarchy of their existence or importance. These needs include aesthetic needs, desire to know, self-actualization needs, esteem needs, love, and belonging needs, safety needs, and psychological needs. Thus as one general type of need is satisfied, another higher order of needs will emerge and become operative in life. These levels of needs are also classified into "being need" and "deficiency needs". The deficiency needs can be satisfied only by others. This shows that an individual can depend on others as a source of need gratification. That of self-actualization desire to know and aesthetic needs are the being needs.

Kaufman (2008) said that needs assessment is the formal process of identifying needs as gaps between current and desired results planning those needs in priority order based on the cost to meet each need versus the cost of ignoring it, and selecting the most important needs (problems or opportunities (for reduction or elimination). This definition emphasizes that needs are gaps in the result rather than the gap of deficiencies in processor resources. It asks the user to assess the discrepancy between what is and what should be in terms of results, and to compare the magnitude of these gaps in results against the cost to close or ignore them. These definitions and related approach to need assessment couples productivity with effectiveness. Therefore, nearly all the approaches see the usefulness of need assessment for obtaining and allocating resources for projects.

This theory is related to this study because Onwuka (2002) emphasized that the fact that before any in-service education program can be established, the felt need of teachers who will participate in such a program must be ascertained. Therefore, the perceived needs of teachers must be considered, and also in-service education training should be structured to permit their active involvement to improve their practical skills. Moreover, the furniture craft technology teachers should concern themselves with the efforts to find out how best to structure their workshops activities so that students will be opportune and encouraged to satisfy their individual needs. Thus, the occasional and appropriate involvement of students and their needs in the planning of curriculum and instruction and also systematic exposure to environmental processes will lead to some reasonably strong interest in the students, especially in furniture craft practical projects.

2.1.3 Theory of Skill Development

Newell (1999) propounded skill development theory which states that "as a learner acquire skills, changes may be observed that reflect strategies that an individual uses to achieve specific movement outcomes". He further observed that skill development is a process in which a performer learns to control and integrate posture, locomotion and muscle activations that allows the individual to engage in a variety of motor behaviors that are constrained by a range of task requirement. A learner may show a change in the special orientation of body limbs as well as exhibit a change in the timing and sequencing of movement. This implies that motor skill acquisition follows a pattern in which learning accumulates with practice.

Newell's theory is related to this study as it emphasized that skill development occurs through the acquisition of skill which will result in changes that may be observed and reflect strategies that an individual uses to achieve specific movement outcomes. One common feature of all the components is that the skills deal with the acquisition of performance ability which enables a skilled individual to perform at the most economic level. The ability to act, think or behave in a particular way, particularly in a way, which has become part and parcel of the individual is the main aim of the acquisition of skills development especially in furniture craft technology practical projects. In support of the above assertion, Ezewu (2003) remarked that in learning a skill, about 65 percent of the time should be spent in practice, to obtain functional technology in technical colleges. He recommended that well-equipped furniture craft workshops and functional machines must be provided, this will enable the individual to marry theory with practice.

2.1.4 Need Assessment Models

The use of need assessment models for identifying and justifying gaps in the result and placing the gap in prioritized order for attention is of great importance in improving the pre-service skills need of woodwork technology graduates of technical colleges. Witkin in Bello (2004) defined needs assessment as any systematic approach to setting priorities for future action.

According to Kaufman (1985) need assessment involves identifying and justifying gaps in results, and placing the gap in prioritized order for attention?

Concerning pre-service skills needs of woodwork technology graduates of technical colleges, learning is more likely to lead to change in practice when needs assessment has been conducted. This will help to identify practices in need of improvement and ensure that educational and organizational interventions were made to address these needs. Grant (2002) classified methods of needs assessment into seven main types, each of which can take many different forms in practice.

Gap or discrepancy analysis: this method involves comparing performance with stated intended competencies by self-assessment, peer assessment, or objectives testing and planning education accordingly.

Reflection on action and reflection in Action: Reflection on action is an aspect of experiential learning and involves thinking back to some performance, with or without triggering (such as videotape or audiotape), and identifying what was done well and what could have been done better. The latter category indicated learning needs. Reflection in action refers to thinking about actual performance at the time that it occurs and demand some means of recording identified strengths and weaknesses at the time.

Self-assessment by diaries journals, logbooks, and weekly reviews: this is an extension of reflections that involves keeping a diary or other account of experiences.

Peer Review: This involves teachers assessing each other practice and giving feedback and perhaps advice about possible education, training, or organizational strategies to improve performance.

Observation: In more formal settings teacher can be observed performing specific tasks that can be rated by an observer. The results are discussed and skills needs are identified. The observer can be school inspectors, a senior teacher, or a disinterested person if the rating is sufficiently objective or overlap with the observers' areas of expertise.

Critical incident review and significant event auditing: this method involves individual identifying and recording of the event. This will enable the individuals to know where better performance is needed, analyzing the incident by its setting exactly what occurred, and the outcome, and why it was ineffective.

Practice review: A routine review of notes, charts prescribing, and letters request, etc. can identify skills needs, especially if the format of looking at what is satisfactory or not for improvement is followed. In addition, Grant (2002) stated that "needs" can be classified into felt needs (What people say they need) expressed needs (expressed in action) normative needs (define by experts), and comparative needs (group comparison).

There is no one model or conceptual framework for a needs assessment that has been universally accepted and there is little empirical evidence of the superiority of one approach over another. Moreover, existing models are so numerous and diverse that criteria for selecting an appropriate approach have been developed. Witkin in Bello (2004) has developed a guideline for the selection of an educational needs assessment approach. The following questions are still useful for evaluating needs assessment models and structuring procedures.

- Who wants a needs assessment?
- Why is a need assessment wanted?
- What should be the scope of assessment?
- On whose needs will you focus and at what level?
- What kinds and amounts of data should be collected for your purpose?
- What sources and methods might you use for data collection?
- What are your constraints on data collection?
- What needs assessment products meet your purposes, constraints, and resources?

Grant (2002) Stressed that need assessment might be to help curriculum planning, diagnose individual problems, assess student learning, demonstrate accountability, improve practice and safety or offer individual feedback educational intervention.

Three basic survey methods for the collection of needs assessment data include questionnaires, interviews, and critical incident techniques. Of these, the written questionnaires are the most common method of collecting needs assessment data (Witkin and Attschuld, (1995) for this study survey method was used for collecting assessment data.

2.1.5 Repetitive Training Theory

Vocational education is in its pedagogy based squarely upon habits psychology. The habits formed are not of value until they have become firmly fixed. Therefore, it is necessary for vocational education that the habit-forming experience should be repeated sufficiently to form permanent habits. Prosser and Quigley in Okorie (2001) propounded repetitive training theory which states that vocational training will be effective in proportion as the specific training experiences for forming the right habits of doing and thinking are repeated to the point that these habits become fixed to the degree necessary for gainful employment.

Special workers of every kind gain by repetitive practice a degree of skill in the performance of activities repeated so often that they become automatic or semiautomatic. In the above theory, it was discovered that as teachers engage in continuous training in vocational education, their competencies in knowledge and skills consequently improve.

2.1.6 Theory of Job Training

Job training may be defined as training in an operation where the entire purpose is to develop skills and allowed the application of technical knowledge. Prosser, et al (1994) also propounded the theory that effective establishment of process habits in any learner will be secured in proportion as the training is given on actual jobs and not exercise or pseudo jobs. Vocational education is oriented towards the acquisition of practical skills; therefore, training should be given on real jobs and not on pseudo jobs. A pseudo job may be defined as an actual production

job that is carried on in actual ways so far as knowledge and skills are concerned, but whose product is in no way utilized and whose working conditions are not those of the occupation.

2.1.7 Theory of Experienced Instructor

Prosser, et al (1994) further propounded the third theory as ‘experience instructor’. In vocational education, the only person who is competent to instruct and train is the individual who is himself a master of his craft and acquired his equipment habits by going through the mill. This theory state that, vocational education will be effective in proportion as the instructor has had successful experience in the application of skills and knowledge to the operations and processes that he undertakes to teach.

The aforementioned theory shows a significant relationship with this study because repetitive training in vocational education will lead to improvement incompetency as a result of the gathered or acquired experiences. Consequently, training in a particular field of specialization in vocational education is of paramount importance. Introductory technology teachers are trained in a vocational institution such as Colleges of Education (Technical) to teach the subject. These same teachers are now required to be teaching Basic Technology in the Universal Basic Education/Junior Secondary Schools (UBE/JSS) with its curriculum course content added with some topics such as information communication technology (ICT) and career prospects and opportunity in technology. Therefore, improvement in knowledge, skills, and attitudes can only be enhanced through training which the base of the theories was.

2.2 Conceptual Framework

2.2.1 Competency Needs Analysis

More often than not, training, re-training, and development programs are adopted in public and private organizations simply because the programs were well advertised and marketed or because other organizations, institutions are using them. It makes little sense for any institution to accept an expensive and time-consuming training program just because other institutions are doing so (ITF, 1992). Schools as a matter of policy should adopt a systematic approach to the identification of training, re-training, and development needs of students. This can be achieved through a good plan staff development program.

According to Mama (2010), the process of identification of training/re-training needs of students is called NEED ASSESSMENT SKILLS. This is a systematic way of identifying educational deficiencies or problems. Unlike traditional program planning, it focuses not only on solutions for a specific problem or away to solve a problem, but also to identify educational problem areas. Caffarchin (2006) classified these needs analyses as prescriptive and motivational models.

A prescriptive model is usually organizational. It is seen as a condition or deficiency relative to a socially accepted standard or norms. On the other hand, the motivational model need is a deficiency relative to the specific individually desired goal. Mocker and Spear (2004), also described two models of need analysis as prescriptive and descriptive. Their prescriptive model is the same as that described by Caffarchin. Prescriptive need analysis occurs when a person or group of persons decide what someone should learn. On the other hand, descriptive need analysis is a process in which the individual or group of persons is involved in identifying their personal needs or determining what is to be learned.

The need analysis for technical students involves the breaking down of the learning into its parts. That is skill knowledge, abilities, and responsibilities required of the technical students for successful performance and which differentiate the job from all others (I.T.F., 1992).

There are three basic parts of the analysis:

(a) A complete and accurate identification of the competency skills level possessed.

(b) A complete and accurate description of the competency skills level possessed.

(c) A complete and accurate description of the requirements skills places on an individual for successful performance.

In carrying out skills analysis, several sources of relevant information must be tapped, to ensure that a complete picture has been obtained. BlumandNaylon (2004) listed nine different methods:

1. The questionnaire method - A worker (in the case of BlockIaying/Bricklaying and Concreting trade students) is asked to respond to questions about the skills in writing.
2. The check-list method - The worker is given a list of tools and asked to check off those that are part of the job.
3. Observational interview - An individual interview is conducted at the workplace.
4. Individual interview - A person currently holding the work is interviewed relative to the work duties.
5. Group interview - Many workers are interviewed together about the work.

6. Technical conference method - Interviews are conducted with experts such as those supervising workers on the work of interest.
7. Diary method - Teachers record their daily activities in a log.
8. Work participation method - The job analysis performs the work.
9. Critical incident method - Workers or supervisors are asked to remember elements of the works that they feel are crucial to success or failure.

2.2.2 Block laying/Bricklaying and Concreting Skills in Technical College

Block/Bricklaying and Concreting is one of the skills offered in technical colleges as enlisted by the Federal Government of Nigeria (2004). Block/ Bricklaying and Concreting module is intended to give the students an insight into the work of a bricklayer or concrete worker, improve their attitudes towards concrete works in buildings and enable them to appreciate the relationship between science and technology. According to NABTEB (2005)

Block/Bricklaying and Concreting are designed to introduce the trainee: (a) to the basic construction principles, materials and methods *so* that they may be able to appreciate the roles of the various trades in the building industry, (b) With the essential knowledge and skill that will enable him to perform completely all aspects of brickwork in the construction industry, (c) with the essential knowledge and skill that will enable him to perform proficiently all aspects of block layers work in the construction industry, (d) with the basic knowledge of the properties and application of concrete as well as the skill in the production of sound concrete structures, (e) and with the basic knowledge of finishing materials related to the buildings work and to enable him to apply such finishes proficiently.

To achieve the above general objectives, the content of (Introduction to Building Construction module include, Hygiene and safety in the workshop and building sites, shop tools used in Block/Bricklaying and Concreting, Basic processes in Block/Bricklaying and Concreting, Site Preparation, Setting Out, Foundations, Floors, Walls, Fixing of Openings, Roofs, Stairs, Finishes and Services. Mama **(2003)** determined the service needs of students in the production of BBC.

The study was designed to:

1. Identify the technical competency skills level possessed in the production of block laying/bricklaying and concreting by building students.
2. Determine the extent to which the students possessed competency skills in block laying bricklaying and concreting.
3. Identify the technical competencies in which the respective groups of students based on education qualification needed in-service education.
4. Ascertain students' educational qualification, learning experience and interactions between qualification and experience significantly influenced students' perception of their skills.

The block/bricklaying and concreting curriculum of the technical college consists of four components; (a) general education, which accounts for 30% of the total hours required for the program (b) trade theory, trade practice and related studies which account for 65% and (c) supervised industrial training/work experience, which accounts for about 5% of the total hours required for the program. (e) The component of the course which may be taken in the industry or

college production unit is compulsory for the full-time students (NBTE, 2009). It is expected that after completion of the modules that student either secure employment in industry, set up their own business and become self-employed, and be able to employ others or pursue further education in advanced technical program and tertiary institutions such as polytechnics, colleges of education (technical) and universities. A course or module which enables individuals to be more functional can be defined as a body of knowledge and skills capable of being utilized on its own or as foundation prerequisite knowledge for more advanced work in the same or other fields. Each trade when completed can be used for employment purposes NBTE (2004).

The following subject is taught as an integral part of Block/Bricklaying and Concreting before an individual can be qualified to sit for National Technical Certificate (NTC) conducted by the National Business and Technical Education Board (NBTE).

- Basic construction management
- Introduction to building construction
- Building drawing and design
- Bricklaying
- Block laying
- Concreting
- Wall, floor, and ceiling finishing

General education is another essential component of building a trade program in Nigeria. Osuala (2004) stated that general education seeks to meet the common needs of youth for competence as a person and as a citizen. He further stated that general education involves those values, attitudes, understanding, and skills that each citizen should possess if he or she is to plan work and act in

consent with others. He added that it is generally because it is for everyone and it is concerned with the total personality. General education is core areas and is required of all technical college students, these include English language, economics, physics, chemistry, biology, entrepreneurial studies, and mathematics and to enhance understanding of machine tools and materials of their trades and their application as a foundation for post-secondary technical education for the trainees (NBTE, 2001). The social studies component is designed to broaden the trainee's social skills and understanding of his environment. Both general and vocational education is part of the total education process. A functional vocational education is usually based on a solid foundation of general education. Vocational and general education complement each other. Both are important in the total process of producing an efficient and effective workforce (Okorie, 2001).

Vocational technical education is effective to the extent that the individual is trained directly and specifically in the thinking and manipulative habits required in the desired occupation". To a great extent, this philosophy is realizable in the technical colleges where the modular approach of curriculum is practiced. The students are trained on the various tasks comprising the operations of the job. For instance, students of building construction in technical colleges can choose block-laying as a module. They will be trained in the thinking and manipulative habits required in block-laying. The duration of the program could be three months, six months, or even a year. After the program they are awarded a certificate in block laying, unfortunately, this modular or competency curriculum has not been implemented as it is supposed to be.

The block laying/bricklaying module include: tools and equipment are in block laying, bricklaying and concreting, cement, brick manufacture, properties, and application, aggregates, and mortars, basic principles of leveling, site preparation, setting out, substructure construction, solid ground floor construction, brick wall construction, arches, scaffolds, fireplace and chimneys for cooking range, rubble walling, drainage, pavement and surface drainage.

The concreting module includes tools and equipment, properties of aggregates, properties of cement, concrete as construction materials, proportioning and mixing, handling, curing and testing, joints in concrete formwork, reinforced concrete basic principles, structural detailing, reinforced concrete production, and pre-stressed concrete.

The wall, floor, and ceiling finishing module include: finishing tools and types of equipment, properties and uses of finishes, principles, and techniques of laying the precast floor, principles and techniques of laying synthetic floor tiles, external and internal rendering, wall rendering, sub soffit, wall tiles and mosaics, claddings and premixed renderings.

The building drawing module includes graphic symbols, lettering, scale, draughting, materials and equipment, designing. Principles like form, function, preliminary sketch, design of site plan, production of component detail drawings of floors, beams, lintels, septic tanks, and soak-away and interior elevations, drawing detail plan of electrical services, meaning and preparation of schedules and reproduction of working drawing. The takeover of the technical college's examination by (NABTEB) has not only changed the curriculum but has also specified the topics/objectives, contents, and both students and teachers activities. The clear specification enables the teacher to plan the instructional strategies. These strategies help the teacher to break

the topic into learnable instruction and other meaningful activities towards achieving the needed tasks in block laying/ bricklaying and concreting trades. Block laying/Bricklaying and Concreting trade modules according to NABTEB (2012) are designed to introduce the trainee:

1. To the basic construction principles, materials, and methods so that they may be able to appreciate the roles of the various trades in the building industry.
2. With the essential knowledge and skill that will enable him to perform completely all aspects of brickwork in the construction industry.
3. With the essential knowledge and skill that will enable him to perform proficiently all aspects of block layers work in the construction industry.
4. With the basic knowledge of the properties and application of concrete as well as the skill in the production of sound concrete structures.
5. With the basic knowledge of finishing materials related to building works and to enable him to apply such finishes proficiently.

2.2.3 Tasks in Block/Bricklaying Work

In every occupation, just like block/bricklaying and concrete, there are tasks that the workers are expected to perform to be effective on the job. A task is a unit of work activities that form a significant part of a duty. Task according to Olaitan (2012) is a logically related set of actions required for the completion of a job. Osuala (2010) stated that task is one of the distinct major activities that constitute logical and necessary steps in the work performed by the worker. Tasks deal with the methods, procedures, and techniques by which parts of a job are carried out. Block/bricklaying and concreting curriculum did not emphasize the skill-related tasks needed to carry out operations in construction sites. This is one of the reasons why students upon

graduation cannot meet up with the expectations of industries because the training environment is not a replica of the world of work. For every occupation, there is a minimum level of preparation needed to enable the trainees to obtain and retain employment in that occupation and if the preparation is not attained up to that level, the occupation will neither benefit the trainee nor the society (Odu, 2013). Block/bricklaying students can only possess saleable skills and contribute their quota to the development of the state and the nation at large when on-site related tasks in block/bricklaying and concreting trade are emphasized in classrooms. The BBC-related tasks include setting out, foundation laying, wall sets, flooring, and plastering/rendering. The objectives of block/bricklaying and concrete cannot be achieved without exposing students to site tasks in relevant areas of block/bricklaying and concreting by the teachers. A teacher is an individual that has been trained pedagogically and in subject matter to equip him with competencies that will enable him to teach learners effectively. A teacher in the opinion of Obanlewa (2004) is someone who has undergone the necessary and recommended training in a teacher preparatory program and is charged with the full responsibility of managing the classroom in such a way as to advance the learning behavior of the students. Regarding the study, a teacher is a person that has acquired special skills required to effectively impart knowledge, skills, abilities, and attitudes in block laying/ bricklaying and concreting to a group of learners. A block/bricklaying and concreting student in the technical college must possess one of these qualifications: Nigeria Certificate in Education (Technical); Bachelor of Education; and Bachelor of Technology; Bachelor of Science; Bachelor of Science and Education; Ordinary National Diploma/ Higher National Diploma; Ordinary National Diploma/ Higher National Diploma and Education (Federal Ministry of Education, 2009).

Teachers are included in this study because they hold trust for implementing the curriculum of formal education to the learners, and are at the center of the education proc Nigeria Certificate in Education (Technical), Bachelor of Education, and Bachelor of Technology; these learners upon graduation are referred to as graduates.

A graduate is an individual who has received training in block/bricklaying and concreting for either 3 or 6 years. Graduates of block/bricklaying and concreting concerning the objectives of technical colleges as stated in the National Policy on Education (2012) are meant to be employed in industries or self-employed. It was observed by Odu (2012) that graduates of block/bricklaying and concreting posse's inadequate skills that will make them self-reliant and sufficiently competent to meet the demands in the world of work in Niger State. Block/bricklaying and concreting graduates as related to this study are students that have passed through technical college education without the basic skills required to function effectively in building industries.

The poor skills possessed by these graduates have led to their unemployment and the few that are employed perform inefficiently in the work field leading to building failure and collapse. Task needed by the graduates for effective participation in the world of work.

Block/Bricklaying must be well cured before being used, the use of young blocks often results in cracking of the wall due to drying shrinkage. It can also cause the erosion of external angles of walls, leaving ugly finishes when the walls are not plastered. The time taken for blocks to cure properly and dry ranges from twenty days to one month, depending upon the method adopted in

curing. After the concrete foundation has been set reasonably well, usually after twenty-four hours of casting, the first course of a wall can be set out. Lines are strained from the wall marks on the profiles. Starting from the external corners of the building, the lines are transferred to the foundation using either a plumb bob or plumb levels. Mortar is laid to the mark and the corner block bedded. After these operations are complete for all the corners, the walls at the corners are then raised, using a gauge rod or water level to obtain a common level. Not much attention is paid to the finishing giving the walls below the ground level, but it is necessary to keep the level of the courses throughout as this affects the neat work (i.e. the work above ground level). The raised corners are toothed or racked back to facilitate the joining of the courses to the corner and ensure strength and maintenance of the original bond. When racking back corner courses, it is necessary to ensure that blocks in the off-sets in each course are in the perfect alignment when checked diagonally with a straight edge.

2.2.4 Tasks in Concreting Work

Concrete according to Dr. A.B. Kagara (2016) is produced by mixing Portland cement, aggregate, and water, and additives may be added to improve the workability or other properties of the concrete mix. The construction operations involved in the production of concrete include batching, mixing, transporting, placing, consolidating, finishing, and curing. Also, Seeley (2012) outlined the concreting operations as comprising batching, mixing, transporting, placing, compacting, and curing the concrete. Batching according to Nunnally (2011) is the process of proportioning cement, water, aggregates, and additives before mixing concrete. Since concrete specifications commonly require a batching accuracy of 1-3% depending on the mix component, materials should be carefully proportioned by weight. Concretes are mixed manually or with the

use of mechanical plants, concrete is transported by carrying on the head if mixed manually. Concrete transported by powered barrows, Lorries, and cranes are ready to mix concrete. If the concrete is to be placed in a foundation trench it will be leveled from peg to peg. Or if it is to be used as an over-site concrete bed, the external walls could act as a leveling guide. The leveling is carried out by tamping with a straight edge board; this tamping serves the dual purpose of compacting and bringing the excess water to the surface so that it can evaporate. Concrete must not be over-tamped as this will not only bring the water to the surface but also the cement paste which is required to act as the matrix. Placing concrete according to Nunnally (2011) is a process of moving plastic concrete into its final position. Before placing the concrete, the underlying surface and the interior of all concrete forms must be clean and tight and their interior surfaces coated with form oil or a parting agent to allow removal of the form from the hardened concrete without damaging the surface of the concrete. He added that concrete may be placed by spraying it into a surface and placed underwater by pumping.

When concrete is placed in deep forms, it should be allowed to drop regardless of height. Their suit of this practice is segregation, damage to form, and embedded fixtures. Reinforcements and forms above the level of placement become coated with mortar which may dry before the concrete comes to that level. The best practice is to drop the concrete into an outside pocket and allowing it to flow over into the form without segregation. For horizontal layers, concrete should be deposited close to its final location. In the case of placing concrete in a slab, it should be dumped into the face of previously placed concrete not away from it. When placing concrete on a slight slope, placing should begin at the lower end of the slope, permitting consolidation of the layer by vibration or any other suitable means. If placement is started at the top of the slope, vibration tends to shift it down the slope.

Concrete should be placed as soon as possible after mixing to ensure that the setting action had not commenced. Concrete that dries out too quickly will not develop its full strength there for new concrete should be protected from the drying winds and sun by being covered with canvas, straw, polythene sheeting, or damp sawdust. This protection should be continued for at least three days since concrete takes about twenty-eight days to obtain its working strength. Compacting is carried out after placing, compacting according to Seeley (2007) must be carried out adequately to secure maximum density, it is done manually or with the use of vibrators.

Concrete should be well compacted against forms, corners, and junctions. The purpose of compaction according to Obande (2002) is to make the concrete as dense as possible by eliminating voids within it. Finishing according to Nunnally (2011) is the process of bringing the surface of the concrete to its final position and imparting the desired surface texture. Finishing operations in concreting include screeding, floating, trowelling, and brooming. The completion of cement hydration requires that adequate moisture be maintained after the concrete is placed. The process of providing the required water and maintaining a favorable temperature for a while after placing concrete is referred to as curing Nunnaly (2011).

Curing according to Obande (2004) is the process of keeping the newly laid concrete under uniform conditions of temperature and moisture during the hydration of the cement compounds. Curing according to him makes concrete stronger, more durable, denser, and more resistant to abrasion. Curing of concrete is the process of maintaining satisfactory moisture content and a favorable temperature in concrete during the period immediately after the placement of concrete

so that hydration of cement may continue till the desired properties are developed sufficiently to meet the requirements of service.

The reasons for curing concrete are to keep the concrete saturated or as nearly saturated as possible, until the originally water-filled space in the fresh cement paste has been filled to the desired extent by the product of hydration of cement, to prevent the loss of water by evaporation and to maintain the process of hydration, to reduce the shrinkage of concrete and to preserve the properties of concrete. The necessity of curing arises from the fact that the hydration of cement can take place only in water-filled capillaries. For this reason, a loss of water by evaporation from the capillaries must be prevented. Further water lost internally by self-desiccation has to be replaced by water from outside. Water required for chemical reaction with cement i.e. for hydration is about 25 – 30% of water added to the cement; the rest of the water is used for providing workability and help to continue hydration.

Types of concrete

1 Paint

2 Reinforced

3 Precast

4 Prestress

- Paint concrete is the combination of cement, graded aggregates, and water of quality proportion. It is stronger in compression and water in tensile strength.
- Reinforced concrete (Oyenuga 2004) stated that is a combination of two dissimilar but complementary materials,

- Precast concrete: it consists of a mixture of cement, aggregate admixtures, and water, cast into a specific shape.
- Prestress concrete: can be defined as the imposition of internal stresses into a structure that is opposite to those that will be caused by the services.

2.2.5 Tools/Equipment Manipulative Skills

Tools: According to (Nunnally 2011) are the instruments or devices that can be handled easily while carrying out special operation as well as instructional and learning activities. Tools are commonly utilized in transmitting knowledge in the workshop or on the field, laboratory to the learners.

Equipment: These according to (Olaitan 2008), are all portable or heavy instrument or mechanical devices for performing a special operation in a Vocational Technical teaching and learning situation. Example of this equipment in the building trade are concrete mixer machine, block molder machine, portable vibrator machine, plate compactor machine, tamping rammer machine, walk-behind roller machine.

Tools can be grouped in Building trade into:

- Measuring tools
- Hand tools
- Cutting tools
- Driving tools
- Protective devices

1. **Measuring tools:** These are tools that are used to measure materials while work and measure ground for excavation it used transfer measure from drawing to ground. Some measuring tools include steel rules, steel tape, rubber tape, chine tape.
2. **Hand tools:** these are tools that are used to do a certain function, such as picking, pressing, throwing, such as hand trowel, sucking board and range pole, spirit level, etc.
3. **Cutting tools:** These tools are used to cut or reduce material by practically removing chips or swarfs from them. Some of them are knives, axes, cutlass, chisels, etc.
4. **Driving tools:** These are Harmers – (ball or straight edge, sled, rubber mallets, mallets,), etc.
5. **Protective devices:** These are devices that are used to protect and guard the body against external hazards that may be harmful to individuals at work in the workshop. Some of these devices include leather gloves, insulated rubber gloves, protective shields, goggles, fixtures, protective tool fixtures, overwear/ lab coat, rubber boot, etc.
6. **Packing, scaffolding, clamp tools** are devices that are used to move or carry material from one place to another such as, Head pan, shovel, spread, wheelbarrow sack bags ladders, folding steel/aluminum scaffolding etc.

The National Board for technical education and national vocation certificate (NVC) suggested a list of equipment and item for block laying/ bricklaying and concreting.

Tool/Equipment

1. Brick Trowel
2. Pointing Trowel
3. Plastering Trowel

4. Spirit Level
5. Plumb Bulb
6. Builder's/Iron Square
7. Chisels
8. Chip Hammers
9. Sledge Hammer/Club Hammer
10. Lines
11. Corner Blocks
12. Floats (Wooden)
13. Hawks
14. Straight Edges
15. Spot Boards
16. Head Pans
17. Shovels
18. Spades
19. Pick Axes
20. Tape Measure *(30m&25m)*
21. Rules
22. Tilting Mixer23 Brick and Block Molds
23. Leveling Instrument (Dumpy Level)
24. Leveling Staff
25. Ranging Poles
26. Block-Making Machine

27. Brick-Making Machine

28. Slump Test Apparatus

29. B.S Sieves *(Different Sizes)*

30. Buckets

31. Wheel Barrows

32. Diggers

33. Mechanical Vibrator *(Optional)*

34. Watering Can

35. Brick/Block Saws

2.3 Review of Related Empirical Studies

Mele *et al.* (2020) carried a study on 'Tracer Study on Skills Possessed by Graduate of Mechanical Engineering Craft Practice Trade (MECPT) of Government Technical Colleges in Adamawa and Borno States of Nigeria. It was carried out to identify the levels of skills possessed by technical college graduates. Relevant literature related to the study was reviewed. A descriptive survey design was used to guide the study. The population was 223, and the sample size was 171 which comprised 120 MECPT graduates from five government technical colleges, 15 industrial managers, 30 supervisors, and 6 ministries of works officials. The sample size was purposively drawn. A structured questionnaire that had 77 items divided into 4 sections A, B, C, and D was used to collect data. The data were analyzed using mean and standard deviation to answer the research questions. Analysis of variance (ANOVA) was used to test the null hypotheses at a 0.05 level of significance. The findings indicated, among others that, the graduates possessed 90% of the skills required of them. While 10% were completely not

possessed by the MECPT graduates. It was recommended, among others that, graduates of MECPT trade should possess the other machine safety and machine operational skills that were not for employment and self-reliance.

Labani *et al.* (2019). Competence-based education and training (CBET) is a functional approach to education as it emphasizes that learners need to gain the necessary knowledge, skills, understanding, and attitudes or values to work successfully in their profession or occupation. It is regarded as a holistic approach to education. This study aimed at finding out how technical college trainers implement the CBET curriculum in Arusha city, Tanzania. The study adopted a qualitative approach through the use of a case study design to get an in-depth understanding of the CBET implementation process. A total of 24 trainers were selected through purposive sampling from three (3) Science and Allied Technology (SAT) technical colleges in Arusha city, Tanzania in which in-depth interviews and open-ended questionnaires were used to collect information. The findings indicated that, though the majority of the trainers got in-service training, more than half had limited awareness and understanding about the meaning and aim of the CBET curriculum. Also, trainers showed little knowledge and skills for employing CBET teaching and learning methods as well as conducting students assessment and evaluations. Lastly, it became apparent that technical colleges in Arusha city have inadequate human and material resources for the effective implementation of the CBET curriculum. It is concluded from the findings that, CBET was introduced without relevant and necessary preparations.

Sarimah and Dahiru (2014) investigate the employability skills in TVET Curriculum in Nigeria Federal Universities of Technology. In the 21st century, employability skill is the most required

skill besides technical knowledge in an attempt to compete for employment and sustain a job in the industrial global market. However, Nigerian TVET graduates are not equipped with the employability skills needed by the industries and as a result, they are not ready to enter the workforce. This concept paper is written to discuss how the curriculum of one of the TVET programs at the Federal Universities of Technology in Nigeria, which is Electrical Technology Education has contributed to this issue. Analytical review on Electrical Technology Education program curriculum showed that the curriculum gave less attention to practice-based courses that provide skills of the program than theory-based courses and no course in the program curriculum that directly teaches good attitudes and traits. As a result, there is a lack of incorporation of employability skills such as Problem-solving and decision making, Lifelong learning, and Competencies amongst the graduates. Other issues discussed are the need for employability skills in the TVET curriculum of Nigeria, employability skills, Electrical Technology Education in Nigeria, and the analysis of Electrical Technology Education curriculum in Nigeria The last part of this paper is a recommendation for the curriculum of Electrical Technology Education to be designed with an equal number of theory and practice courses by giving emphasize on all eleven generic skills, good traits, and attitudes.

Oluseyi *et al.* (2020). Investigate Competency needs of business educators in Osun state secondary schools, Nigeria. Competency is one of the essential elements in teaching. It also determines the effectiveness of teachers during the teaching and learning process and the performance of students. The study, therefore, investigated the competency needs of business educators in Osun State intending to know those competencies that are needed but not possessed. A descriptive research design of survey type was adopted for the study. The population was 613

business educators out of which 300 were sampled using simple and stratified random sampling techniques. A self-design 20-item questionnaire titled "Teachers' Competency Assessment Questionnaire (TCAQ)" was used to collect data for the study. The instrument was constructed on a 4-point scale. The instrument was validated by two experts. The reliability of the instrument was established using Cronbach alpha and this yielded a reliability coefficient of 0.78. The research questions raised were answered using the means scores. Any item with a mean score greater than or equal to 2.50 suggests moderate possession, an item with a mean score ranging from 1.50 to 2.49 suggests fairly possession while an item with a mean score of 1.49 or below suggests not possession. Findings of the study revealed that out of four competencies assessed, two were moderately possessed (planning of instruction and classroom instruction skills) one was fairly possessed (practical demonstration skills) while the remaining one was not possessed (ICT skills). It was recommended among others that government and relevant agencies need to organize series of training for business educators to acquire the needed skills.

Okoro (2015). Assessed the management competencies possessed by postgraduate university business education students to handle entrepreneurship business challenges in Nigeria University Business Education graduates, by the nature of their program, ought to possess relevant management competencies for successful entrepreneurship but casual observation and empirical reports indicate that they are not doing well in this aspect. Therefore, this study assessed the management competencies possessed by the university postgraduate Business Education students to handle entrepreneurship business challenges in Nigeria. One research question and five hypotheses guided the study. A descriptive survey design was adopted for the study. The population, also used as the sample, consisted of 388 Business Education graduates who are currently running their postgraduate program in universities in the south-south and southeast

geopolitical zones in Nigeria. The questionnaire was adequately validated by experts in Business Education and measurement and evaluation. The internal consistency of the instrument was determined using Cronbach alpha with a reliability coefficient of 0.93 was used for data collection. The mean and standard deviation were used to answer the research questions while Z-test was used to test the hypotheses at a 0.05 level of significance. The result revealed that Business Education graduates are competent inability to plan for small or medium scale business, ability to organize small scale business, ability to source funds for the running of a small scale business among others. It was recommended that Business Education graduates should undergo conferences and workshops on how to manage small scale businesses.

2.4 Summary of Reviewed Literature

The literature review for the study assesses the skill level possessed in block laying/bricklaying and concreting students in technical colleges. The concept of practical skills and various technical skills in block laying/bricklaying and concreting were reviewed in the study.

A logical strategy for increasing the efficiency of teacher education to determine the various skills and knowledge needed by all vocational-technical students, which of these skills and knowledge are truly common across several service areas and cluster them together. Then a training program (s) could be designed relative to pre-service and future retraining priority of teaching skills and knowledge. While empirical work of Nigerian vocational-technical education

students' shows a high need for training of Nigeria Certificate of Education (NCE) students. Technical and Bachelor of Education (Ed. Tech) in technical skills in all fields of Vocational and Industrial Education. There are many similarities between this study on technical competency need in block laying/bricklaying and concreting in technical colleges and those cited in the literature review. The present investigation is related to those presented in the review.

The major purpose includes the determination of competency requirements for effective skills performance and the identification of general competency skills in block laying/bricklaying and concreting students. Self-reporting inventories were designed to obtain workers' or employers perceived level of importance and level of possession or performance incompetence.

However, most of the competencies identified by these researchers, although appeared useful for this study cannot be claimed to be completely needed as well as possessed by building trade students in technical colleges.

The literature reviewed on approaches to identification of tasks helped to direct the researcher in identifying the competency skills level possessed in block/bricklaying and concreting and so facilitated the arrangement of tasks in a cluster for simpler and easier discussion and understanding. The Concreting in Niger State are not employed because they lack saleable skills, the literature reviewed on competency required in block laying/bricklaying and concreting helped the researcher to develop questionnaire items for collecting data to identify the competency required ineffective practice of the trade. It was observed that few technical college

graduates of Block laying/Bricklaying few that are employed do not perform quality work which therefore leads to building failures and collapse.

Block/bricklaying and concreting as a program in technical colleges in Nigeria have not been able to achieve the aims of introducing it. The literature review has shown that the program needs to be reviewed by National Board for Technical Education (NBTE) and should be made to involve more and varied tasks that will be needed in the field of work. Students in technical colleges (bricklaying, block laying, and concreting) have not properly channeled the use of task analysis to their learning process. In this way, the development of workplace and saleable skills level possessed by building technology graduates cannot be achieved.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This chapter presents and explains the research methodology which includes research design, area of the study, population, instrument for data collection, validation of the instrument, reliability of the instrument, method of data collection, and method of data analysis

3.1 Design of the Study

This study was a descriptive survey research method because it involves the use of a questionnaire to determine the option and response of Block/Bricklaying and Concreting

students and teachers in Technical Colleges. Okoro (2009) stated that a questionnaire is most suitable for data collection where the respondents are literate.

3.2 Area of the Study

The research study covered out in Niger State. Niger State was created out of the defunct North Western State in 1976. Niger State shares its borders with the Republic of Benin (West), Zamfara State (North), Kebbi State (North-West), Kogi (South), Kwara (South-West), Kaduna (North-East), and the Federal Capital Territory. The State comprises 25 local government areas grouped into seven education zones namely; Minna, Suleja, Bida, Kutigi, New Bussa, Rijau, and Kontagora. The State is the largest state in Nigeria in terms of landmass. It covers about 86,000 sqkm² (8.6million hectares) representing about 9.3% of the land area of the Country.

Niger State has six owned Technical Colleges; Technical Colleges include Government Technical College Kontagora; Government Technical College, New Bussa; SulemanBarau Technical College Suleja, Government Technical College Pandogari, Government Technical College Eyagi-Bida, Government Technical College Minna.

3.3 Population for the Study

The population for the study comprises of Block/Bricklaying and Concreting teachers and students of block/bricklaying and concreting in six (6) technical colleges in Niger State. A total of 10 teachers and 60 students of block/bricklaying and concreting will be used for the study. There was no sampling because the population is of manageable size.

3.4 Sample and Sampling Techniques

The population of the teachers was relatively small in number, therefore; the entire population of the teachers was used and the population of students was sampled based on their population. Stratified random sampling was used. 70 persons were sampled out from the entire population consisting of 60 students and 10 teachers of block/bricklaying and concreting.

3.5 Instrument for Data Collection

The instrument for data collection was a structured questionnaire developed by the researcher. The questionnaire contains two sections (A and B). Section A consist of respondents personal data, while section B consist of respondents view on items of the questionnaire which has a section I, II, and, III. Section I contained 14 items that deal with competency skills level possessed in Block laying, Bricklaying, and Concreting students in technical colleges, Niger State. Section II contained 14 items that deal with the competency skills level possessed in concreting work during practical classes in technical colleges in Niger State. Section III contained 22 items that deal with the competency skills level possessed in the uses of hand tools during practical classes in technical colleges in Niger State.

The response option of the questionnaire is structured on a four-point rating scale as follows; Highly Competent, Competent, Moderately Competent, Not Competent with values of 4, 3, 2, and 1 respectively. This is illustrated below:

Response categories		**Points**	**Limited**
Highly Competent	(HC)	4	4.50 – 5.00
Competent	(C)	3	3.50 – 4.49

Moderately Competent	(MC)	2	1.50 – 2.49
Not Competent	(NC)	1	1.00 – 0.49

3.6 Validation of the Instrument

The instrument for data collection was validated by three lecturers from the Department of Industrial Technology and Education. (Building Technology option) of Federal University of Technology Minna, Niger State. The experts were requested to make necessary observations, adjustments, corrections, and suggestions which were effected before the production of the final copy of the questionnaire.

3.7 Reliability of the Instrument

The instrument for data collection was administered to the respondent by visiting the school, 10 questionnaires administered to teachers 60 questionnaires were administered to students and return to prevent instrument mortality, and the percentage return rate is hundred (100)%

3.8 Method of Data Collection

The questionnaire was the main instrument used by the researcher for this study. The questionnaire designed was administered by the researcher personally by visiting the Government Technical Colleges in Niger State included in the study with a copy of the introduction letter from the project coordinator. 70 questionnaires were distributed to respondents.

3.9 Method of Data Analysis

The research questions were answered using mean and standard deviation while a t-test will be used to test the null hypotheses at a 0.05 level of significance. For answering research questions, any item with a mean response of 3.50 and above will be considered as competency while any item with a mean below 1.00 will be regarded as not competency. For testing the null hypotheses, if the calculated t- value is equal or greater than the t- table (t – critical), the null hypotheses will be rejected. If the calculated t-value is less than the t-table (t-critical), the null hypotheses were accepted. The numerical value assigned to the rating shown below

Highly Competent	(HC)	=	4
Competent	(C)	=	3
Moderately Competent	(MC)	=	2
Not Competent	(NC)	=	1

Mathematically the mean value.

$X = \sum fx/\mu$

Where X = mean

$\sum$ = summation

X = normal value of option

μ = number of items

f = frequency

Therefore, $\bar{X} = \sum fx/\mu$

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

$$= \frac{10}{4}$$

$$\bar{X} = 2.50$$

Mathematically, the standard deviation

$$S.D = \sqrt{\sum X^2} \div N$$

Where $\sum$ = summation

X = squared deviation from mean

N = total numbers of items

Mathematically, the t-test

T=X2-X4/√s2/n2+s4/n4

Where S = standard deviation of the values

N = total numbers of values

X = mean of values

CHAPTER FOUR

4.0 Presentation and Analysis of Data

This chapter presented the data collected and analyzed for the study. The analyzed data were used for answering the research questions drawn from the study.

4.1 Research Question I

What are the competency skills level possessed in Blocklaying/Bricklaying work during practical classes in technical colleges in Niger State?

Table 1: **Mean responses of the respondents on the competency skills level possessed in Blocklaying/Bricklaying work during practical classes in technical colleges Niger State**.

S/NO.	ITEM	X_1	X_2	X_t	REMARKS
1.	Mixing cement and sand with correct ratio mortar	3.45	3.40	3.43	Competent
2.	Laying of bed with mortar	3.41	3.48	3.45	Competent
3.	Ability to set out Flemish bond	3.35	3.48	3.42	Competent
4.	Ability to set out English bong	3.34	3.37	3.36	Competent
5.	Ability to set out Header bond	3.36	3.25	3.31	Competent
6.	Ability to set out Stretcher Bond	3.37	3.40	3.39	Competent
7.	Ability to set out building accurately	3.32	3.25	3.29	Competent
8.	Laying block from the foundation level to the lintel level	3.22	3.40	3.31	Competent
9.	Laying block from lintel level to completion level	3.47	3.34	3.41	Competent
10.	Competency in horizontal and vertical mortar joint	3.21	3.42	3.33	Competent
11.	Ability to interpret building plan	3.44	3.45	3.33	Competent
12.	Ability to align block/bricks on a course	3.08	3.28	3.18	Competent
13.	Mixing mortar for building practical	3.19	3.40	3.30	Competent
14.	Ability to demolish practical building class structure	3.21	3.25	3.26	Competent

***Key*:**

X_1 = mean of Blocklaying Bricklaying and Concreting Teachers

X_2 = mean of Blocklaying Bricklaying and Concreting Students

Xt = $\frac{X1 + X2}{2}$

The data in Table 1 revealed that all the 14 items have their mean values ranged from 3.18 to 3.45.This showed that the mean value of each item was above the cut-off point of 2.50, indicating that all are competency in BBC students in technical colleges in Niger State.

4.2 Research Question 2

What are the competency skills level possessed in concreting work during practical classes in technical colleges in Niger State?

Table 2: **Mean responses of the respondent on the competency skills level possessed in concreting work during practical classes in technical colleges in Niger State.**

S/N	Items	X_1	X_2	Xt	Remarks
1	Selection of concrete materials	3.54	3.51	3.53	Competent
2	Identify concrete materials during practical classes	3.09	3.14	3.12	Competent
3	Ability to carrying out slump test	2.98	3.05	3.02	Competent
4	Ability to carry out cube test	3.48	3.40	3.44	Competent
5	Competency in crushing of cube	3.19	3.43	3.27	Competent
6	Measuring the required mixing proportion	3.54	3.17	3.36	Competent
7	Carry out compacting factor test	3.40	3.31	3.36	Competent
8	Batching of concrete	3.46	3.37	3.42	Competent
9	Competency in mixing concrete	3.32	3.25	3.29	Competent
10	Transporting concrete mixing	3.41	3.25	3.33	Competent
11.	Pouring of concrete mixing	3.43	2.91	3.17	Competent
12	Placing of concrete mixing from its source	3.47	3.45	3.46	Competent
13.	Compacting concrete	3.35	3.42	3.39	Competent
14.	Curing of concrete mixing	3.31	3/34	3.33	competent

***Key*:**

X_1 = mean of Blocklaying Bricklaying and Concreting Teachers

X_2 = mean of Blocklaying Bricklaying and Concreting Students

$$Xt = \frac{X1 + X2}{2}$$

The data in Table 2 revealed that all the 14 items have their mean values ranged from 3.05 to 3.53.This showed that the mean value of each item was above the cut-off point of 2.50, indicating that all are competency in BBC students in technical colleges in Niger State.

4.3 Research Question 3

What are the competency skills level possessed in the uses of hand tools during practical classes in technical colleges in Niger State?

Table 3: **Mean responses of the respondent on the competency skills level possessed in the uses of hand tools during practical classes in technical colleges in Niger State**.

S/N	Items	X_1	X_2	Xt	Remarks
1	Using brick trowel	0.29	3.20	1.75	Competent
2	Use of plastering trowel	3.35	3.37	3.36	Competent
3	Using pointing trowel	3.34	3.25	3.30	Competent
4	Ability to use spirit level	3.34	3.31	3.33	Competent
5	Ability to use ranging poles	3.23	3.40	3.32	Competent
6	Ability to use float (wooden)	3.26	3.22	3.24	Competent
7	Competency in using builder square	3.40	3.31	3.36	Competent
8	Use of hark straight	3.33	3.31	3.32	Competent
9	Competency in using line and pins	3.35	3.14	3.25	Competent
10	Using leveling instrument (Dump Level)	3.32	3.54	3.43	Competent

11	Ability to use internal and external angle tools	3.25	3.17	3.21	Competent
12	Competency in using tape measure	3.30	3.08	3.19	Competent
13	Using of head pans	3.36	3.34	3.35	Competent
14	Using of shovel	3.38	3.40	3.39	Competent
15	Ability to use foam and duster	3.29	3.42	3.36	Competent
16	Use spot boards	3.32	3.31	3.32	Competent
17	Ability to use straight edges	3.31	3.22	3.27	Competent
18	Ability use block asks	3.43	3.34	3.39	Competent
19	Using of steel hawk	3.46	3.28	3.37	Competent
20	Using of chip hammer	3.39	3.28	3.34	Competent
21	Ability to use buckets	3.25	3.34	3.30	Competent
22	Ability to use digger	3.30	3.31	3.31	Competent

***Key*:**

X_1 = mean of Blocklaying Bricklaying and Concreting Teachers

X_2 = mean of Blocklaying Bricklaying and Concreting Students

Xt = $\frac{X1 + X2}{2}$

The data in Table 3 revealed that all the 22 items have their mean values ranged from 3.19 to 3.43.This showed that the mean value of each item was above the cut-off point of 2.50, indicating that all are competency in BBC students in technical colleges in Niger State.

4.4.0 Hypothesis I

Table 4: There is no significant difference in the mean responses between Bricklaying Blocklaying teachers and Bricklaying /Blocklaying work students with regards to the competency skills level possessed during practical classes in technical colleges in Niger State.

Table 4: Mean, standard deviation and t-test analysis of respondents regarding the competency skills level possessed by Bricklaying, Blocklaying work students during practical classes in technical colleges in Niger State. N1 = 10 N2 = 60

S/N	Items	X_1	SD_1	X_2	SD_2	t-cal	Remarks
1	Mixing cement and sand with correct ratio mortar	3.45	0.63	3.40	0.65	0.40	NS
2	Laying of bed with mortar	3.41	0.66	3.48	0.50	0.53	NS
3	Ability to set out Flemish bond	3.35	0.68	3.48	0.70	0.95	NS
4	Ability to set out English bond	3.34	0.68	3.37	0.54	0.21	NS
5	Ability to set out header bond	3.36	0.60	3.25	0.70	0.86	NS
6	Ability to set out stretcher bond	3.37	0.69	3.40	0.69	0.17	NS
7	Ability to set out building accurately	3.32	0.66	3.25	0.61	0.50	NS
8	Laying block from the foundation level to the lintel level	3.22	0.69	3.40	0.60	1.31	S
9	Laying of block from the lintel level to completion level	3.47	0.58	3.34	0.63	1.09	S
10	Competency in horizontal and vertical mortar joint	3.21	0.95	3.42	0.77	1.18	S
11	Ability to interpret building plan	3.44	0.59	3.45	0.56	0.14	NS
12	Ability to align blocks/bricks on a course	3.08	0.76	3.28	0.71	1.34	S

13	Mixing mortar for building practical	3.19	0.67	3.40	0.65	1.54	S
14	Ability to demolishing practical building class structure	3.21	0.58	3.25	0.74	0.33	NS

Data presented in Table 4revealed that each of the 14 items had their calculated t- values ranged from 0.14 to 0.95 which were less than t-table value of 1.54 at 0.05 level of significance and at70 degree of freedom (df). This indicated that there was no significant difference in the mean responses of students and teachers of brick/blocklaying work required by technical colleges in foundation laying. Therefore, the null hypothesis of no significant difference between the mean responses of students and teachers of block/bricklaying work required by technical college graduates in foundation laying was upheld.

4.4.1 Hypothesis II

Table 5: There is no significant difference in the mean responses between BBC teachers and BBC students with regards to the competency skills level possessed in concreting during practical classes in technical colleges in Niger State.

Table 5: Shows the mean, standard deviation and t-test analysis of respondents regarding on the competency skills level possessed in concreting work during the practical classes in technical colleges in Niger State.

S/N	Items	X_1	SD_1	X_2	SD_2	t-cal	Remarks
1	Selection of materials	3.54	0.61	3.51	0.56	0.28	NS
2	Identify concrete material	3.09	0.72	3.14	0.60	0.33	NS

3	Ability to carrying out slump test	2.98	0.65	3.05	0.76	0.50	NS
4	Ability to carrying out cube test	3.48	0.74	3.40	0.60	0.59	NS
5	Competency in crushing test	3.19	0.78	3.34	0.53	1.03	NS
6	Measuring the required mixing proportion	3.54	0.61	3.17	0.78	0.85	NS
7	Carry out compaction factor test	3.40	0.64	3.31	0.67	0.72	NS
8	Batching of concrete	3.46	0.66	3.37	0.73	0.66	NS
9	Competency in mixing	3.32	0.51	3.25	0.50	0.64	NS
10	Transporting concrete mixing	3.41	0.49	3.25	0.74	1.42	NS
11	Pouring of concrete mixing	3.43	0.63	2.91	0.61	0.14	NS
12	Placing of concrete mixing from its source	3.47	0.66	3.45	0.56	0.12	NS
13	Compacting concrete mixing	3.35	0.73	3.42	0.50	0.54	NS
14	Curing of concrete mixing	3.31	0.68	3.34	0.69	1.20	NS

The data presented in Table 5 revealed that each of the 14 items had their calculated t- values ranged from 0.12 to 0.85 which were less than t-table value of 1.20 at 0.05 level of significance and at70 degree of freedom (df). This indicated that there was no significant difference in the mean responses of students and teachers of concrete work by technical colleges in wall setting. Therefore, the null hypothesis of no significant difference in the mean responses of students and teachers of concreting work in technical colleges in wall setting was upheld.

4.4.2 Hypothesis III

Table 6: There is no significant difference in the mean responses between BBC teachers and BBC students with regards to the competency skills level possessed in the uses of hand tools during practical classes in technical colleges in Niger State.

Table 6: Shows the mean, standard deviation and t-test analysis of respondents regarding on the competency skills level possessed in the uses hand tools during the practical classes in technical colleges in Niger State.

S/N	Items	X_1	SD_1	X_2	SD_2	t-cal	Remarks
1	Using brick trowel	0.29	0.73	3.20	0.63	0.64	NS
2	Use plastering trowel	3.35	0.65	3.37	0.59	0.13	NS
3	Using pointing trowel	3.34	0.68	3.25	0.61	0.66	NS
4	Ability to use spirit level	3.34	0.65	3.31	0.67	0.22	NS
5	Ability to use ranging poles	3.23	0.71	3.40	0.65	1.18	NS
6	Ability to use float (wooden)	3.26	0.69	3.22	0.77	0.28	NS
7	Competency in using builder square	3.40	0.59	3.31	0.58	0.80	NS
8	Use of hark straight	3.33	0.63	3.31	0.83	0.13	NS
9	Competency in using line and pins	3.35	0.61	3.14	0.60	1.74	NS
10	Using of leveling instrument (Dump Level)	3.32	0.66	3.54	0.70	1.65	NS
11	Ability to use internal and external angles tools	3.25	0.65	3.17	0.78	0.62	NS
12	Competency in using tape measure	3.30	0.67	3.08	0.70	1.59	NS
13	Using of head pans	3.36	0.60	3.34	0.72	0.17	NS
14	Using of shovel	3.38	0.57	3.40	0.77	0.10	NS
15	Ability to use foam and duster	3.29	0.70	3.42	0.60	1.03	NS
16	Use spot boards	3.32	0.70	3.31	0.71	0.05	NS

17	Ability to use straight edges	3.31	0.69	3.22	0.68	0.60	NS
18	Ability to use block ass	3.43	0.55	3.34	0.72	0.72	NS
19	Using of steel hawk	3.46	0.56	3.28	0.62	1.53	NS
20	Using of chip hammer	3.39	0.61	3.28	0.62	0.92	NS
21	Ability to use buckets	3.25	0.67	3.34	0.63	0.64	NS
22	Ability to use digger	3.30	0.77	3.31	0.63	0.09	NS

***Key*:**

NS = Not Significant

S = Significant

The data presented in Table 6 revealed that each of the 22 items had their calculated t- values ranged from 0.05 to 0.92 which were less than t-table value of 1.74 at 0.05 level of significance and at70 degree of freedom (df). This indicated that there was no significant difference in the mean responses of students plastering/Rendering. Therefore, the null hypothesis of no significant difference in the mean responses of students and teachers by the uses of hand tools in plastering/Rendering was upheld.

4.5 Findings of the Study

The following are the findings of the Study: The finding related to the competency skills level possessed in Bricklaying/Blocklaying work during practical classes in technical colleges in Niger State.

1. Mixing cement and sand with correct ratio mortar

2. Laying of bed with mortar
3. Ability to set out Flemish bond
4. Ability to set out English bond
5. Ability to set out header bond
6. Ability to set out stretcher bond
7. Ability to set out buildings accurately
8. Laying of blocks from foundation level to lintel level

The finding related to the competency skills level possessed in concreting work during practical classes in technical colleges in Niger State.

1. Selection of concrete materials
2. Identify concrete materials during practical classes
3. Ability to carry out slump test
4. Ability to carry out cube test
5. Competency in crushing test
6. Measuring the required mixing proportion
7. Carrying out compacting concrete
8. Batching of concrete

The finding related to the competency skills level possessed in the uses of hand tools during practical classes in technical colleges in Niger State.

1. Using brick trowel
2. Use of plastering trowel
3. Using pointing trowel
4. Ability to use spirit level
5. Ability to use float (Wooden)l
6. Ability to use ranging poles
7. Competency in using builder square
8. Use of hark straight
9. Competency in using line and pins
10. Use leveling instrument (Dump Level)

4.6 Discussion of the Finding

The discussion of the findings of the study was discussed in lined with the research question and hypotheses.

The finding as indicated in table 1 revealed that the students have acquire the practical on mixing of aggregate with water, casting of concrete for foundation, among others. These make the student perform below average in schools and industries. This finding was in line with the view of Benson 2015, who stated that lack of adequate skills by the students may make the student not to be employable in construction industry. This is because technical, students graduate are more theoretical, in which the industries spent money in retraining such skills men if given a job. Research question two dealt the competency skills used in blocklaying/bricklaying students during practical work in technical colleges in Niger State.

The finding as indicated in table 2 reveals that the competency skills level possessed in blocklaying bricklaying work students of bricklaying department have most of the facilities in their workshop, and classes which includes, Instructional material , such as drawing board, Drawing paper, Pencil, Set square , Ruler, Eraser, T-square, protractors. Hand tools including: shovel, head pans, brick trowel, and plaster trowel float wood, builder square, hark straight, spirit level. Safety wear such as, lab coat, safety boot, hand goof, goggle, and helmet and among others. This was in line with Robert 1981, who noted that there is need to of using facilities in carrying out practical to develop the skill required as a builder. Industry that has skills men will be able to produce more efficiently/produce.

Research question three dealt the method in teaching and learning blocklaying bricklaying and concreting practical skill in technical colleges in Niger State.

The finding as indicated in table 3 revealed that the students were not expose to field trip, project method. They spent more time on theory than practical due to that fact they lack of skills of acquiring facilities and laboratory.

Discussion of the Findings

The technical competency skills level possessed by Blocklaying/Bricklaying and concreting students in Government Technical Colleges were analyzed and ascertained as they were found relevant. This finding is an indication that those technical competency skills are complementary for effective job motivation performance and satisfaction of any worker. This is in line with Reisbery (2010) who stated that personality development can be described as a combination of a

press and skills. Hence, the desire to satisfy or gratify these skills directs or –dictates human behavior.

The above concepts of skills have implication, among other things, to teachers in general and Blocklaying/Bricklaying and concreting students in particular.

The BBC students by virtue of the job requirements, needs proper training program to equip him/herself properly to face the job.

The result from the analysis of research question one show that the competency skills of students of Blocklaying/Bricklaying and Concreting are on practical aspects of introduction to building construction. This is in agreement with Olaitan (2010), Onwu (2012) and Onwu (2014) which emphasized the fact that before any training program is established, the felt needs of students who will participate in such a program must be ascertained. The identified competency skills on introduction to BBC as competent by the respondents should be the basis for any in-service training. This is to support Hughes and Doughery (2013) who suggested that the perceived skills of students must be considered, and also in-service education program should be based on the identified needs of the students which should be structured to permit their active involvement.

The analysis of research question two presented in table 3 provided such finding as indicated by the mean rating of students, Competencies skills by students of Blocklaying/Bricklaying and concreting were all competent by the respondents who believed it should be in both theoretical and more of practical in-service training program. This supports the opinion of Akubue (2011) and Anyakoha (2012) which states that skills for in-service training should be based on

competencies in which the respondents found themselves deficient and so need re-training in an in-service education program.

According to research question three as analyzed in table 4, the finding of this table shows that there are some competencies that are needed in BlockIaying/Bricklayinig work students which could be acquired through theoretical program. Though most of the respondents competent that the acquisition of the desired competencies will be more through practical training program. According to Green (2000), a comprehensive knowledge of the competencies skills in BlockIaying/Bricklaying work is essential for students of Blocklaying/Bricklaying and Concreting in higher education level.

Green explained that a competent BlockIaying/Bricklaying work students must be skilled in the selection of appropriate materials in guiding the students to carryout successful projects using the selected materials through a planned practical activity.

In the analysis of research question four, presented in table 5, the findings revealed that the competencies skills in Concreting work by students should be organized through practical training program as indicated by the mean rating of the respondents' responses. This supports Ani (2013) proposal that teaching effectiveness is a function of what to teach, how to teach, to whom it will be taught and the condition under which it will be taught. In line with this, Cannon (2011) also focused on the personal and professional qualities of the teacher for effective teaching and learning.

The analysis of research question five presented in table 6 has the following findings. The finding shows that there were some competencies skills in the uses of hand tools in Blocklaying/Bricklaying and concreting students which could be acquired through theoretical program. Though, some respondents agreed that the acquisition of the desired competencies will be more through practical training program. This agreed with Green (2001) who explained that professional teachers must be skilled in the selection of appropriate materials in guiding the students to carry successful projects.

The findings of this research, more so as it affects research question six, showed that the perception of graduate and non-graduate students by the uses of hand tools on the theoretical competency skills for Brick/Blocklaying and concreting trades are similar. Showing that competency skills by the graduate and non-graduate are the same. Nwachukwu (2014) pointed out that the knowledge of these teaching components will so much bear on the ability of the teacher to acquire skills or competencies in the methodology of teaching, the psychology of teaching, teaching communication skills and evaluation skills. Agwu (2015) supported by saying that quality education presupposes quality teaching which can only be achieved through mastery of the various skills in the teaching components.

CHAPTER FIVE

5.0 Conclusion and Recommendations

This chapter presented the summary of the study, the conclusion, and implications of the finding, recommendations and the suggestions for further study.

5.1 Summary of the Study

Three research questions were developed and answered by the study; and three hypotheses were formulated and tested. Relevant literature were reviewed for the development of the instrument for data collection. The study adopted survey research design. The population for the study was 70 persons consisting of 10 teachers of block/bricklaying and concreting and 60 students. A set of structured questionnaire (On competency skills level possessed by Blocklaying/Bricklaying and Concrete students in technical colleges) consisting of 70 items was developed and used for data collection. The questionnaire was face validated by three experts from Department of industrial technology of education in Federal University of Technology Minna Niger State Nigeria. The experts were asked to identify ambiguities and give suggestions for improving the instrument towards meeting the objectives of the study. They also assessed the instrument and ensured that the items were clearly stated and appropriate for the stated research questions and hypotheses. Their inputs were used to reconstruct and update the instrument before the administration. Cronbach alpha coefficient method was used to determine the internal Consistency of the instrument. A total of 70 copies of the competency skills level possessed BBC related tasks required by Building Technology students. Questionnaire were administered to the respondents by the researcher and with the help of two research assistants. The completed

questionnaire were collected after the interval of a week. The data collected were analyzed using mean for answering the three research questions while t-test statistic was used to test all the null hypotheses at 0.05 level of significance.

5.2 Implications of the Findings

The findings of this study have implications for the Government and the teachers of building technology. The government will provide necessary training facilities required for effective teaching of on students in technical colleges. The government will also package the tasks determined and integrate it into the curriculum of technical colleges for the training of individuals. The Government will also employ capable hands for teaching building technology in technical colleges across the state. The findings of this study have implication for building technology teachers in technical colleges. These teachers will see it important to acquire competency skills for effective teaching of building technology in technical colleges. The findings also have implication for building technology lecturers in tertiary institutions. It is their responsibility to write books on various types on competency skills level possessed in BBC for teaching and learning in schools and colleges.

5.3 Contribution to Knowledge

The study helps improve the competency skills level possessed by block/bricklaying and concreting students in order to be self-reliance. Therefore, the competency skills identified could be used to train building technology students in order to be self-reliance. The stated objectives of building technology education will now be achievable ones.

5.4 Conclusion

Based on the findings of the study: It was discovered that students of Blocklaying Bricklaying and Concreting skills required in their trade, and teachers of building technology employ various teaching methods to inculcate practical skills students in their trade. From the study also, it was understood that the teaching facilities and instructional materials are not enough for proper psychomotor skills development for Blocklaying, Bricklaying and Concreting students in Government Technical Colleges in Niger State, and students require some requisite skills improvement in blocklaying bricklaying and concreting in technical colleges in Niger State

5.5 Recommendations

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

1 The job related tasks determined should be integrated to the curriculum of building technology of technical colleges in Nigeria.

2 Material resources such as technical textbooks, equipment, hand tools and teaching aids should be provided by government for teaching on competency skills level possessed by Blocklaying/Bricklaying and Concrete students in technical colleges.

3 Qualified and well-grounded teachers of block/bricklaying and concreting should be employed for teaching in technical colleges.

4 Workshop, seminars and short time training should be organized for block/bricklaying and concreting in technical colleges by school administrators and government.

5 Practical should be packaged and use for retraining building technology students at skills acquisition centre.

5.6 Suggestions for Further Research

The following related areas have been suggested for further research.

1 Work skills needed by building technology students of technical colleges for sustainable employment after graduation

2 Competency improvement needs of students for effective performance in building technology trades in Niger State.

3 Competency improvement needs of teachers for effective teaching of building technology trades to students 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:
ASSESSMENT OF COMPETENCY SKILLS LEVEL POSSESSED BY BLOCKLAYING, BRICKLAYING AND CONCRETING STUDENTS IN TECHNICAL COLLEGE, NIGER STATE, NIGERIA

PERSONAL DATA

INSTRUCTION: Please complete this questionnaire by sincerely ticking [√] the column that best represent your opinion on the statement.

The questionnaire is for research purpose and your view be treated confidentially

Respondent
BBC TEACHER [ ] BBC STUDENT [ ]

School……..……..……..……

Respond option:

HIGHLY COMPETENT (HC) = 4 points

COMPETENT (C) = 3 points

MODERATELY COMPETENT (MC) = 2 points

NOT COMPETENT (NC) =1 point

PART II

SECTION A

Research Question 1

What are the competency skills level possessed in Blocklaying/Bricklaying work during practical classes in technical colleges in Niger State?

S/N	Competency skills level possessed in block/brick work	HC	C	MC	NC
1	Mixing cement and sand with current ratio mortar				
2	Laying of bed with mortar				
3	Ability to set out Flemish bond				
4	Ability to set out English bond				
5	Ability to set out header bond				
6	Ability to set out stretcher bond				
7	Ability to set out building accurately				
8	Laying of blocks from foundation level to lintel level				
9	Laying of blocs from lintel level to completion				
10	Competency in horizontal and vertical mortar joint				
11	Ability to Interpreting building plan				
12	Ability to align blocks/bricks on a course				
13	Mixing mortar for building practical				
14	Ability to demolishing practical building class structure				

SECTION B

Research Question 2

What are the competency skills level possessed in concreting work during practical classes in technical colleges in Niger State?

S/N	**Competency skills level possessed in concrete work**	**HR**	**R**	**MR**	**NR**
1	Selection of concrete materials				
2	Identify concrete materials during practical classes				
3	Ability to carrying out slump test				
4	Ability to carrying out cube test				
5	Competency in crushing of cube				
6	Measuring the required mixing proportion				
7	Carrying out compacting concrete				
8	Batching of concrete				
9	Competency in mixing concrete				
10	Transporting concrete mixing				
11	Pouring of concrete mixing				
12	Placing of concrete mixing from its source				
13	Compacting concrete				
14	Curing of concrete mixing				

SECTION C

Research Question 3

What are the competency skills level possessed in the uses of hand tools during practical classes in technical college in Niger State?

S/N	Competency skills level possessed in the use of tools	HC	C	MC	NC
1	Using brick trowel				
2	Use of plastering trowel				
3	Using pointing trowel				
4	Ability to use sprit level				
5	Ability to use float (wooden)				
6	Ability to use ranging poles				
7	Competency in using builder square				
8	Use of hark straight				
9	Competency in using line and pins				
10	Use leveling instrument (Dump Level)				
11	Ability to use internal and external angle tools				
12	Competency in using tape measure				
13	Using of head pans				
14	Using of shovel				
15	Ability to use foam and duster				
16	Use spot boards				
17	Ability to use straight edges				
18	Ability to use block asks				
19	Using of steel hawk				
20	Using of chip hammer				
21	Ability to use buckets				
22	Ability to use digger				

FORMULA

Mathematically the mean value.

$X = \sum fx/\mu$

Where X = mean

$\sum$ = summation

$\overline{X}$ = normal value of option

μ = number of items

f = frequency

Therefore, $\overline{X} = \sum fx/\mu$

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

$$= \frac{10}{4}$$

$\overline{X} = 2.50$

Mathematically, the standard deviation

$S.D = \sqrt{\sum x^2 \div N}$

Where $\sum$=summation

X=squared deviation from mean

N=total numbers of items

Mathematically, the t-test

$T = X2\text{-}X4/\sqrt{s2/n2+s4/n4}$

Where S=standard deviation of the values

N=total numbers of values

X=mean of values