ASSESSMENT OF HUMAN AND MATERIAL RESOURCES FOR THE TEACHING AND LEARNING OF WOODWORK IN DELTA STATE TECHNICAL COLLEGES

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DELTA STATE UNIVERSITY,

ABRAKA

SEPTEMBER, 2015.

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SEPTEMBER, 2015.

CERTIFICATION

The undersigned certify that this dissertation was carried out by IGBERADJA, Serumu with Matriculation Number PG/11/12/206128 in the Department of Technical and Business Education, Faculty of Education, Delta State University, Abraka.

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(Dean of Education)

DECLARATION

I, **IGBERADJA, Serumu** hereby declare that this dissertation is a record of my original research work and to the best of my knowledge this work has not been presented by any other researcher to any other institution of learning for the award of any degree or certificate.

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IGBERADJA, Serumu **Date**

(PG/11/12/206128)

DEDICATION

This research work is dedicated in memory of my father Late Hon. Kehinde Peter Igberadja Abeke and nephew Late Master Okoro Stephen Ewomazino.

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ABSTRACT

The implementation of woodwork curriculum in technical colleges in Nigeria needs adequate human and material resources for effective teaching and learning of woodwork. However, several researchers have reported inadequate human and material resources in Nigerian technical colleges. Hence, this study was conducted to assess the human and material resources for the teaching and learning of woodwork in Delta State technical colleges. Ten research questions guided the study and five hypotheses were formulated. Survey research design was used. The population of the study was the six technical colleges and twenty eight staff comprising of principals and woodwork personnel. Census population was used, therefore no sampling was done. The instruments for data collection were National Board for Technical Education (NBTE) checklist of woodwork resources and questionnaire. The questionnaire was face validated by three lecturers from Delta State University, Abraka, and to ascertain the reliability of the questionnaire, it was administered to 10 principals and woodwork personnel from technical colleges in Edo State. Data were analysed using Cronbach Alpha technique and a reliability coefficient of 0.66 was obtained. Data were collected by the researcher from woodwork personnel and principals. Also, data collected were analysed using frequency count, mean, and standard deviation for the research questions, while t-test was used to test the hypotheses at 0.05 level of significance using SPSS version 16.0. The study revealed that the human and material resources for the teaching and learning of woodwork in Delta State technical colleges were inadequate when assessed based on NBTE woodwork resources benchmark and ratings from principals and woodwork personnel. Based on the findings, it was recommended amongst others that adequate human and material resources such as qualified woodwork teachers/instructors, woodwork technicians, workshop attendants, infrastructural facilities, power tools, hand tools, machines and consumable materials ,should be adequately provided in Delta State technical colleges for effective implementation of woodwork curriculum.

CHAPTER ONE

INTRODUCTION

Background to the Study

Wood is a hard, tough substance that forms the trunk of a tree. Technically, the term wood includes other parts of the tree such as the roots and branches. The process of working with wood is called woodwork (Okwori, Adamu, & Odo, 2013). According to Hornby (2000), woodwork is also seen as the activity or skill of making objects from wood by woodwork craftsmen. Woodwork is a field of study referring to the educational process when it involves, in addition to general education, the study of technologies and related sciences and the acquisition of occupational skills and knowledge in the manipulation of woodwork consumable materials, hand tools, and machines to produce finished woodwork products. This type of education contends with training that borders on acquisition of knowledge and skills in woodwork. Woodwork is offered formally at the post junior secondary school level with the aim of producing craftsmen and master craftsmen in woodwork.

According to Moja (2000), the National Board for Technical Education (NTBE), established in 1985, gave recognition to three broad classifications of technical institutions and their different missions in meeting the needs of their society. The three institutions are vocational schools, technical colleges and polytechnics/ colleges of technology/colleges of education (technical). Woodwork has areas of specialization and these include carpentry, joinery, cabinet making and wood machining. Okwori (2012) citing Agbo (2000) opined that, woodwork is that type of training intended to prepare the students to earn a living in an occupation in which success is dependent largely on understanding of technology as applied to modern technology and design in wood. This type of education provides skills, knowledge and attitudes necessary for effective employment in specific occupation (Okoro, 1993). Woodwork, therefore, involves the engagement of both teachers and students in theory and practical (Agbo in Okwori, 2012). Federal Republic of Nigeria (FRN, 2004) identified areas of woodwork as follows: Upholstery, carpentry and Joinery, wood machines and furniture making.

In support, National Board for Technical Education (NBTE, 2007), outlined that the topics in woodwork technology syllabus are basic joinery; hand tools; wood processing; wood work machining 1 (portable powered tools); advanced joinnery; wood work machining 2 (machine tools); formwork; framing work; construction drawing; introduction to building construction 1-3; and introduction to computer aided design. According to NBTE (2007) the goals of woodwork technology education in technical college is to produce competent hands with job knowledge and practical skills for a successful career in carpentry and joinery. As well, product of National Technical Certificate in Carpentry and Joinery should be able to:

i. understand the general and specific techniques in carpentry and joinery.
ii. construct and erect different types of roof model.
iii. draw and interpret constructional drawings.
iv. apply portable hand and machine tools to process wood and wood products.
v. design and construct floor, wall, and stair framings, including ladders and scaffolds.
vi. construct and install doors, windows, partitions and cabinets.
vii. work as a skilled carpenter, either in self-employment or in paid employment.

Also, Okwori, Adamu, and Odo (2013) observed that woodwork graduate of technical college should be capable of independent work; they should interpret technical drawing and perform all the calculations relating to woodwork trade. Woodwork technology students should also have sufficient knowledge of elementary science to understand the materials in which they work with.

In implementing woodwork curriculum, human and material resources are very important in the iprocess. Buttressing this assertion, Federal Republic of Nigeria, FRN, (2004) noted that no educational system can rise above the quality of its resources. For the purpose of this work, woodwork resources for teaching are classified into material and human resources. According to Obomanu and Akporehwe (2011), human resources in woodwork refer to teaching and non teaching staffs, while material resources play an integral role in the teaching and learning process as they serve to stimulate thinking, make learning enjoyable,

interesting, exciting and concrete. Material resources remain useless when there are no qualified woodwork personnel to put them into use. Thus, woodwork personnel are indispensable human resources that utilize the available material resources to implement woodwork curriculum in technical colleges. Resources for teaching woodwork could be human (for example: principals, teachers, cleaners and workshop attendants). On the other hand, material resources for teaching and learning woodwork include infrastructural facilities (such as classroom blocks, workshop, store, library, and staff office), library resources (such as woodwork textbooks, teachers guide, woodwork curriculum), utilities (such as extinguishers (including fire buckets), workbench (compta, and first aid box), hand tools (such as paint brushes (various sizes), marking guage/mortise guage, and marking knives), woodworking power tools (such as circular saw bench, thicknesser , and surface planner) and consumable materials (such as wood, nails of various sizes, and wood glue).

For effective implementation of technical and vocational education (TVE) in Nigeria, the Federal Government of Nigeria established the National Board for Technical Education (NBTE). The NBTE overseas issues regarding the accreditation of TVE programmes for technical colleges, mono-technics, polytechnics, and other vocational institutions. Also, to maintain standard, the NBTE sets minimum standard for human and material resources, and these standard also known as benchmark must be met before any TVE programmes can be run in technical colleges and other vocational institutions.

However, despite these standard set by NBTE, woodwork candidates' performance in National Business and Technical Examination Board (NABTEB) examination is absolutely poor. According to Aina (2000), performance at the National Technical Certificate (NTC)/National Business Certificate (NBC) examinations taken in technical colleges in 1999 revealed very disturbing statistics attributable to utter neglect, poor funding, and inadequacy of resources. Poor management of facilities resulted in failure rates from 14 percent - 48 percent in Electrical and Mechanical trades, 12 percent - 50 percent in Construction trades and 18 percent - 94 percent in Business trades.

One of the causes of high failure rate of woodwork candidates in NABTEB examination was as a result of dearth of woodwork personnel and other resources. From the fore going, the situation of government technical colleges in Delta State regards to the dearth of woodwork personnel and other resources might not be different. The researcher therefore strongly advocated the need to assess the human and material resources for the teaching and learning of woodwork in Delta State technical colleges. The intention was to provide feedback on the position of resources meeting the woodwork resources standards or benchmark of National Board for Technical Education (NBTE) and its examination body NABTEB.

Assessment is a form of evaluation that uses collected data to estimate the worth of a programme (Poripo, 2012 citing Okoro, 1993). Okoro, (2005) posited that, assessment and evaluation are usually carried out in two ways: through the recommendations of teachers and through standards prescribed by government such as NBTE, examination bodies such as NABTEB. The government and examination bodies may have recommended certain levels of resources for teaching and learning of various courses. Such prescribed standards can be the basis for assessment. According to Poripo (2012) citing Wikipedia (2006) assessment is the systematic determination of merit, worth and significance of a programme. This means that, assessment provides objective means of monitoring the progress of an individual in a programme (Poripo, 2012).

More so, assessment is the classification of something with respect to its worth, appraisal, categorization, sorting and classification. It is also the act of judging or evaluating a person, facilities, a situation or an event (Poripo, 2012). In addition, assessment is the process of documenting, usually in measurable terms, knowledge, skill attributes and believes. The researcher further noted that assessment can focus on facilities, or the educational system as a whole. Assessment therefore, implies a process of determining the worth or the effectiveness of school quality indicators like facilities, equipment, and classrooms in the training of graduates.

It is on the premise of assessment result, that the extent of availability and adequacy of woodwork resources can be determined and possibly proffer

improvement strategies. Despite the various types of models adopted by educational assessors, the primary aim is to assess if the programme is of standard. In Delta State, human and material resources constitute essential component of woodwork curriculum implementation which need to be assessed in order to know if woodwork resources meets the standard set by NBTE. Consequently, suggest possible solution for improving the resources for the teaching and learning of woodwork in Delta State technical colleges. Olaitan (1996) asserted that the survival of any programme (woodwork programme inclusive) is achieved by constantly searching for programme improvement through assessment process. This type of regular assessment of resources for teaching and learning woodwork in government technical colleges have not been carried out regularly by the Federal and State Ministry of Education, the National Board of Technical Education (NBTE), Inspectors of Educations, School Administrators, and Technical College Heads' of Department of Woodwork. Also literatures known to the researcher on the assessment of human and material resources for teaching and learning woodwork in government technical colleges in Nigeria and Delta State in particular appears to be scanty. Hence, it is against these backdrops that this study seeks to assess the human and material resources for the teaching and learning of woodwork in Delta State Technical Colleges.

Statement of the Problem

There has been extreme fall in the performance level of woodwork candidates in National Business and Technical Education Board (NABTEB) examination. In support, NABTEB Registrar/Chief Executive during a meeting of the Federal Ministry of Education, and National Stakeholders Consultative Meeting on improving performance in public examination, reported that the performance of woodwork candidates from Delta State technical colleges were extremely poor. In the year 2006, one woodwork candidate was examined and failed which represent one hundred percent failure rate. Also, in the year 2007, three woodwork candidates were examined, and all the three woodwork candidates failed which represent one hundred percent failure rate. However, from the year 2008 to 2010, no woodwork candidate was examined. The causes of the persistent failure rate of woodwork candidates in NABTEB examination from the year 2006 to 2010 as opined by

NABTEB Registrar/ Chief Executive was as a result of dearth of personnel and material resources amongst others.

In addition to high failure rate of woodwork candidates in NABTEB examination, woodwork graduates of technical colleges remained unemployed when these graduates are suppose to be employers of labour. This according to Aring (2012); Audu, Yusri, and Farhad (2013); and Okafor (2011), is because woodwork graduates lack employable and occupational skills. Despite successive government effort to revitalized technical colleges in Delta State, failure rate of woodwork candidates in NABTEB examination have not been reduced. Based on these backdrops, there is need to assess the human and material resources for the teaching and learning of woodwork in Delta State technical colleges.

Research Questions

The following research questions guided the study:

1. What are the human resources available for the teaching and learning of woodwork in Delta State technical colleges?
2. Are the human resources available for the teaching and learning of woodwork in Delta State technical colleges adequate in relation to NBTE benchmark?
3. What are the infrastructural facilities available for the teaching and learning of woodwork in Delta State technical colleges?
4. Are the infrastructural facilities available for the teaching and learning of woodwork in Delta State technical colleges adequate in relation to NBTE benchmark?
5. What are the hand tools available for the teaching and learning of woodwork in Delta State technical colleges?
6. Are the hand tools available for the teaching and learning of woodwork in Delta State technical colleges adequate in relation to NBTE benchmark?
7. What are the power tools available for the teaching and learning of woodwork in Delta State technical colleges?
8. Are the power tools available for the teaching and learning of woodwork in Delta State technical colleges adequate in relation to NBTE benchmark?

9. What are the consumable materials available for the teaching and learning of woodwork in Delta State technical colleges?
10. Are the consumable materials available for the teaching and learning of woodwork in Delta State technical colleges adequate in relation to NBTE benchmark?

Hypotheses

The following hypotheses were tested at 0.05 level of significance.

1. There is no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of human resources for the teaching and learning of woodwork in Delta State technical colleges.
2. There is no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of infrastructural facilities for the teaching and learning of woodwork in Delta State technical colleges.
3. There is no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of hand tools for the teaching and learning of woodwork in Delta State technical colleges.
4. There is no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of power tools for the teaching and learning of woodwork in Delta State technical colleges.
5. There is no significant difference in the mean response of and woodwork personnel from rural and urban areas on the adequacy of consumable materials for the teaching and learning of woodwork in Delta State technical colleges.

Purpose of the Study

The major purpose of this study is to assess the human and material resources for the teaching and learning of woodwork in Delta State technical colleges. Specifically, the study assessed the:

1. Availability of human resources for the teaching and learning of woodwork in Delta State technical colleges.
2. Adequacy of human resources for the teaching and learning of woodwork technology in Delta State technical colleges in relation to NBTE benchmark.
3. Availability of infrastructural facilities for the teaching and learning of woodwork in Delta State technical colleges.
4. Adequacy of infrastructural facilities for the teaching and learning of woodwork in Delta State technical colleges in relation to NBTE benchmark.
5. Availability of hand tools for the teaching and learning of woodwork in Delta State technical colleges.
6. Adequacy of hand tools for the teaching and learning of woodwork in Delta State technical colleges in relation to NBTE benchmark.
7. Availability of power tools for the teaching and learning of woodwork technology in Delta State technical colleges.
8. Adequacy of power tools for the teaching and learning of woodwork in Delta State technical colleges in relation to NBTE benchmark.
9. Availability of consumable materials for the teaching and learning of woodwork in Delta State technical colleges.
10. Adequacy of consumable materials for the teaching and learning of woodwork in Delta State technical colleges in relation to NBTE benchmark.

Significance of the Study

This study will be beneficial to woodwork teachers, school administrators, researchers, and students. Woodwork teachers/instructors of technical colleges will benefit from this study because it will expose the state of resources in all the technical colleges in Delta State which will enable them to ascertain whether the resources are available and adequate for the teaching and learning of woodwork.

Also, the study will enable the school administrators to know the level of availability and adequacy of resources for the teaching and learning of woodwork based on National Board for Technical Education (NBTE) standards for resources and also it will help school administrators to know the resources that are inadequate in the technical colleges in Delta State.

To researchers, the result of this study will be useful when carrying out similar researches and reviewing related literatures.

Students of woodwork will benefit from this study in the sense that the state of availability and adequacy of human and material resources in the technical colleges of Delta State will be exposed.

The study will bridge the gap in knowledge production with specific reference to resource evaluation in technical colleges generally in Nigeria.

Scope and Delimitation of the Study

This study covered the assessment of the human and material resources for the teaching and learning of woodwork in Delta State technical colleges. It covered the six (6) technical colleges in Delta State. This scope was chosen to enable the researcher to perform an in-depth study of the area under coverage.

Operational Definition of Terms

The following terms were used and defined as:

1. **Assessment:** This is the collection of data on the level of available human and material woodwork resources with special reference to NBTE benchmark of woodwork resources in Delta State technical colleges.
2. **Resources:** These refer to woodwork personnel and materials used for the teaching and learning of woodwork in Delta State technical colleges.
3. **Woodwork:** This is one of the technical trade courses in Delta State technical colleges.
4. **Technical College:** This is the six government technical colleges in Delta State
5. **Urban Technical College:** This is the three technical colleges in Agbor, Sapele and Kwale.

6. **Rural Technical College:** This is the three technical colleges in Isselle-uku, Ofagbe and Otor-Ogor.
7. **Available:** This is the state whereby Delta State technical colleges have resources for teaching and learning woodwork.
8. **Adequate:** This is the state whereby Delta State technical colleges have the NBTE required resources for teaching and learning woodwork.
9. **Teaching and Learning:** This process depends on adequate resources for effective result.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

The literatures for this study were reviewed under the following sub-headings:

1. Theoretical Framework
2. John Dewey Theory of Valuation
3. Conceptual Framework
4. Human and Material Resources for Teaching and Learning Assessment Model
5. Concept of Teaching and Learning
6. Concept of Technical Education
7. Historical Development of Technical Education in Nigeria
8. Objectives of Technical College Education
9. Problems of the Technical College Teacher
10. Resources for Teaching and Learning Woodwork Technology in Technical Colleges
11. Expected Standard of Resources for Teaching and Learning Woodwork Technology in Technical Colleges
12. Review of Related Empirical Studies
13. Appraisal of Review of Related Literature

Theoretical Framework

John Dewey Theory of Valuation

In any Intellectual society all professional practices according to Tita (1991), are expected to hinge on vigorous intellectual framework aimed at advancing the attainment of programme goals and objectives. Attempts to arrive at information useful to others in considering the value of educational programmes require some framework in which to think about the valuing process (Cooley and Lohyness, 1976). In view of this, that the theory of valuation proposed by John Dewey in 1938 provides a convincing framework for this evaluation inquiry. The theory proposes that thinking about values is of great importance to educational practice because all

educational practices have undertones of values that are expected at the end of instruction. The theory further contends that, facts have their bearing in the value of things and that value propositions should not be considered to be empirically untestable or else it will be considered to be serving the interest of just a group, and when tested, it should be concluded to have worth to justify its continuous existence (Lere, 1996).

Dewey in Cooley and Lohness (1976), in his theory of valuation states that the value of an object or process depends upon how well it satisfies some needs. This implied that any programme that fails to meet up the intended consequences should be considered valueless and, hence, should be thrown away. The theory further stresses that decision about curriculum worth can only be arrived at through investigation of its consequences and outcomes. Dewey in Cooley and Lohness (1976), believes, therefore, that evaluation is that type of deliberation which has its beginning in troubled activity and its conclusion in the choice of a course of action which straightens it out. In addition to these theories, any evaluative inquiry of this nature also requires a model for organizing and analyzing the probable functional relationships among the different domains of relevant variables (Cooley and Lohness, 1976). Several models exist and these models are useful, mainly in providing suggestions to evaluator in solving their own designed problems. Unfortunately, however, each available model has been devised to meet the needs of a particular situation.

Conceptual Models

Several tactics and strategies have been adapted by assessors in assessing social action, programmes such as welfare, science, health and education. These tactics and strategies are called models. A model according to Bello and Okafor (1997), therefore, is a system or a working mechanism with which programme assessment operates based on the purpose in which assessment is focused. It shows the components and structures of assessment and how these are interrelated in bringing about a specific intent.

An assessment model is the steps or a system of operation which can be utilized by assessors to generate information which can be used by decision makers

in the improvement of educational programmes. Assessment models provide general guide, which can be adopted or modified to suit specific programmes that is being assessed. However, no standard assessment model is used to assess human and material resources for teaching and learning technical trade courses such as woodwork in technical colleges in Nigeria. Therefore the model that was used in this study was developed by the researcher. This model is called Human and Material Resources Assessment Model (HMRAM) and can be used to assess human and material resources for the teaching and learning of technical trade courses such as woodwork in technical colleges in Nigeria.

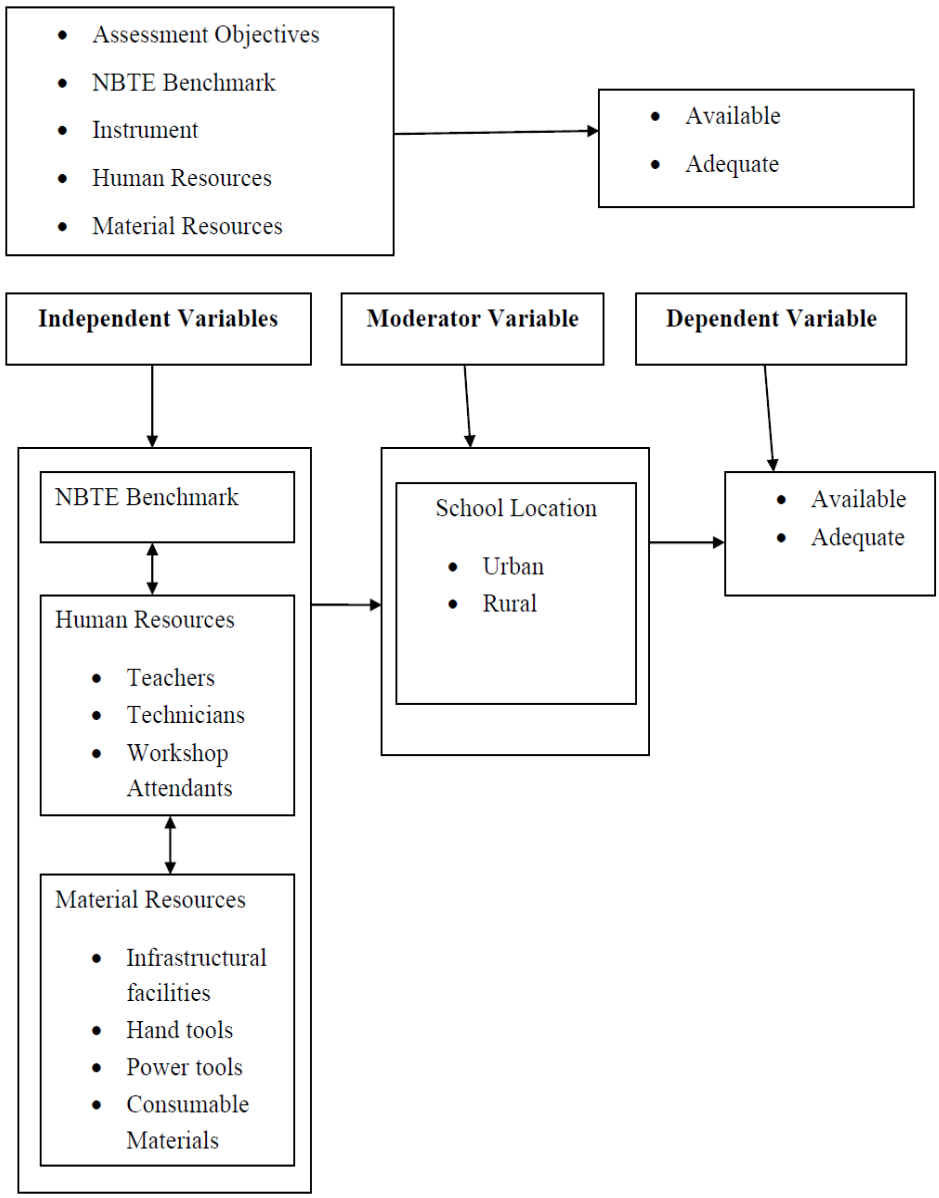

Figure 1: Conceptual Model (HMRAM) Designed by the Researcher

Conceptual Framework

Assessment in Education

Assessment refers to a judgment which can be justified according to specific weighted set goals, yielding either comparative or numerical ratings. Assessment is an ongoing process aimed at understanding and improving student learning. It involves making expectations explicit and public; setting appropriate criteria and

high standards for learning quality; systematically gathering, analyzing, and interpreting evidence to determine how well performance matches those expectations and standards, and using the resulting information to document, explain, and improve performance (Angelo, 1995). Therefore, educational assessments can serve a variety of purposes, and the choice of assessment depends in part on how the assessment information will be used. There are three broad uses for educational assessment, all of which are relevant to vocational education (U.S. Congress, Office of Technology Assessment, 1992): to improve learning and instruction; to certify individual mastery; and to evaluate program success.

Assessment Process

The process of assessment is the mechanics or steps required to effectuate a judgment. A judgment cannot be made within a vacuum, therefore points of comparison, i.e. standards and goals are necessary. The criteria narrow the choices of specific items which are considered important and relevant for any specific judgment within any given context. Therefore, within the process are manifest the parameters within which the judgment is made. In other words, during the process of making a judgment, all these elements are in constant inter-play.

Summative Assessment (SA)

The process of assessment leads to summative assessment, that is, a judgment which encapsulates all the evidence up to a given point. This point is seen as a finality at the point of the judgment. A summative assessment can have various functions which do not impinge on the process.

Formative Assessment (FA)

Since the process of assessment is a single process, that is, making judgment according to standards, goals and criteria, FA is the same process as SA. In addition, for an assessment to be formative, it requires feedback which indicates the existence of a ‘gap’ between the actual level of the work being assessed and the required standard. It also requires an indication of how the work can be improved to reach the required standard.

Concept of Teaching and Learning

Teaching is a science as well as an art. Also, teaching is the teacher behaviour or activities designed and performed to produce a change in students (learners) behaviour. However, teaching is a complex art of guiding learners through a variety of selected experiences geared towards the attainment of all round development of the individual. More so, teaching is the act of inculcating ideas, knowledge, principles, attitudes, and experience intentionally by an experienced and qualified person to students (learners) with little or no experience in that particular field of study.

On the other hand, Learning simply means modification of behaviour as a function of practice. Also, learning accounts for differences in behaviour which are not due to such factors as maturation, sensory adaptation and other phenomenon which may produce observable changes in the activities of the organism. Learning is an ongoing process of thinking, acting, doing and responding to different situations. More so, learning is a basic process in human behaviour at a particular time and place and it is from cradle to grave. According to Hilgard (1986) learning is a relatively permanent change in the behaviour potential which can occur as a result of reinforced or rewarded practice.

Concept of Technical Education

Technical education is defined by different authors in different ways (Odu, 2011). According to Okoro in Odu (2011) technical education is all those experiences whereby an individual learns to carry on successfully any useful occupation. These experiences may be organized and institutionalized or unorganized and haphazard. Miuni, Yee, Tee and Muhammad (2012) saw technical education as;

i. a component of educational activity oriented to provide the necessary knowledge and skills to perform a particular job post, an occupation or professional ability in the market. At the same time, its acts as a supplement form to other types of education by training people to become self reliant.

ii. an activity connected with the process of technological transfer, innovation and development. Knowledge and skills should be transferred since it is the fundamental basis for the process of technological innovation and development.

According to Uwaifo (2010) technical education is an aspect of education designed to prepare students for industry, agriculture, commerce, home economics which is usually provided at the senior secondary or lower tertiary level. More so, Dike (2009) saw technical education as designed to develop occupational skills to give individuals the skills to "live, learn and work as productive citizens in a global society''. For Aina (2009), it is an education for skill building and skill identity, which ultimately becomes a means of livelihood. Also, Obanya (2007) opined that technical education is part of integral development of the 'three Hs' - the head, the heart, and the hands which must not be neglected, as doing that will amount to a denial of an individual's integrated personality development, further adding that any meaningful programme of technical education is to be predicated on a sound general education. It is that aspect of education that exposes the learner to acquisition of demonstrable skills that could be transformed into economic benefits (Akerele, 2007).

Umunadi (2013) posited that technical education is the education designed at upper secondary and lower tertiary level to prepare middle-level personnel (technicians, middle management) and at university level to prepare engineers and technologists for higher management. Technical education includes general education, theoretical for higher management. Technical education includes general education, theoretical, scientific and technical studies and related skill training. The components of technical education may vary considerably depending on the type of personnel to be prepared and the education level.

Also, Miller (2011) posited that technology education was formerly restricted to technical education which according to Aina (1994) meant skill training in crafts and in certain trades such as building, auto mechanics and woodwork. Now the major fabric of technology education involves training in the process of applying both science and technical education to practical problems right from

primary to tertiary level of education. This is because it aims at developing practical skills as well as the creative and innovative abilities and facilitates decision making skills and problem solving abilities.

Yusuf (2006) posited that technical education is a form of education that seeks to prepare persons for employment in recognized occupations. This type of education provides the skills, knowledge and attitudes necessary for effective employment. Technical education could be regarded as that aspect of education which provides the recipients with the basic knowledge and practical skills needed for entry into the world of work as employees or as self-employed (Oni 2007). Oni quoted Adeyemi (1997) who depicted technical education as that aspect of the total education process that focuses on individual occupation, while Olaitan (2007) explained technical education is that type of education, which is complemented with the development of skills, knowledge and attitudes necessary for success to any occupation.

Contrasted with general education, technical education is skill-oriented and trains both the head and the hands (Oranu, 2009). The Federal Republic of Nigeria (2004) further describes technical education as that aspect of education that leads to the acquisition of practical skills as well as applied scientific knowledge. This type of education was under emphasized in the early Nigerian education. Jacob (2006) lamented that in the early Nigerian education system, little focus was placed on technical training that could produce persons adequately skilled, confident and properly oriented towards eventual self-employment and self-reliance. This phenomenon, he concludes, accounts for the large scale unemployment of youth today.

Historical Development of Technical Education in Nigeria

Our colonial masters (the British) recognized the importance of technical and vocational education (TVE) early enough and tried hard to lay a foundation for its take off (Adegbile, n.d). Adegbile further stated that, in the premises of Yaba College of Technology, some organized training schemed were in operation. These training include:

(a) Lands and Survey Training School (1908),

(b) Marine Training School (1928) and

(c) Public Works, Posts and telegraphs and railway (1931)

However, a total of about three thousand technicians were trained through these schemes up to 1945. Yaba Technical Institute, which became Yaba College of Technology, was established in 1947 and inherited the building vacated by the earlier established Yaba higher College whose students were then transferred to Ibadan as the pioneer students of Nigeria Premier University. Yaba Technical Institute formally took off in 1948 and its functions were to provide:

i. Pre-vocational courses in Engineering, printing and commercial subjects which were four years secondary technical or secondary commercial courses.

ii. Part time day and evening courses in Mechanical and electrical engineering, building construction.

The evening courses were intended mainly as in-service training programme for those already in employment with the Railways and United Africa Company (UAC). By October 1948, a total of five full-time and part-time courses ranging from Mechanical Engineering Assistants to Handicraft Instructors courses were offered with a total enrollment of approximately 400 students. The Electrical Engineering Assistants and Architectural Assistants courses were introduced in 1949; Civil Engineering Assistants courses in 1950 and in 1953, the institute had a total enrollment of six hundred students (600) half of whom were residential and studying on full-time basis. However, in 1959 the institute presented the first set of students for the city and guilds of London Institute Examinations in Building Construction and Electrical/Mechanical Engineering.

Prior to this arrangement, the students had been assessed by means of internal Diploma examinations. Similar institutes were established by the Colonial Masters in Enugu (1950); Illorin (1951); Kano (1953); Ijebuode and Ogbomoso (1959) all geared towards the provision of adequate manpower. Consequently, in

1987, the National Council on Education (NCE) approved a broad classification of technical institutions as follows;

i. **Best Centres:**

Vocational schools at the post primary level, engage in artisan training to produce artisans. The course lead to the award of ministry of labour trade test certificate and is tenable for employment especially in government.

ii. **Technical Colleges**:

These are at the post junior secondary school level which produces craftsman and master craftsmen. The courses lead to the award of National Business Certificate (NBC) and National Technical Certificate (NTC). Both at craft level. Advanced National Business Certificate (ANBC) and Advanced National Technical Certificate (ANTC) at master craft level. The certificates are awarded by the National Business and Technical Examination Board (NABTEB)

iii. **Apprenticeship Schemes:**

These are training outfits, not necessarily component of the formal system, but form an integral part of our technical education and training. Given their level of contribution to manpower production, they constitute a force to be reckoned with. Similarly, due recognition must be accorded to the open apprenticeship scheme of the National Directorate for Employment (NDE), and popular road side apprenticeship motor mechanic scheme and numerous other semi skilled professional which produce most of the artisans working in the industries today.

iv. **The Polytechnics/Colleges of Technology**:

This category includes; mono technics e.g. colleges of agriculture, school of survey, school of fisheries, etc. They are post secondary institutions which in most countries, emerged as a result of development amalgamation of lower level institution to satisfy needed manpower requirements in industry agriculture and commerce. The polytechnics in Nigeria can thus be regarded as the apex of technical and vocational education.

Objectives of Technical College Education

The objectives of vocational and technical education as stipulated in the National Policy on Education (FRN, 2004) shall be to:

(i) Provide trained manpower in applied science, technology and business particularly at craft, advance craft and technical levels.
(ii) Provide the technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development;
(iii) Give training and impart the necessary skills leading to individuals who shall be self-reliant economically.

Problems of the Technical College Teacher in Nigeria

The problems of the technical college teacher are many and they arise from: inadequate supply of instructional materials; lack of adequate motivation, poor professional, personal and public image; lack of well equipped library for research workshop; frequent curriculum changes, lack of well articulated in-service education programme for technical teachers, insufficient university admission for training of technical teachers etc. However, not all the problems will be examined because of limited space and time. Nevertheless some of the problems are:

1. Inadequate Technical Workshop:

Most technical colleges cannot boast of adequate functional workshops even when the teachers may be ready to teach the students, in spite of poor remuneration. There are some cases where technical equipment were supplied but no workshop to install the equipment. This certainly led to frustration on the part of the technical college teachers (Miller, 2011).

2. Inadequate Supply of Instructional Materials:

Instructional and consumables materials in technical colleges are very expensive and the federal and state governments have not been providing funds to address this critical area. All we are getting is just lip service to technical education. Even when the teachers are ready to improvise instructional materials, the little

amount of fund needed could still not be received from the college authorities (Miller, 2011).

3. Lack of Adequate Motivation:

Technical college teachers are subjected to deplorable working conditions. Hardly are they found in furnished offices, instead they are put in large staff rooms, at times with students type of desks and chairs, whereas their counterparts in other sectors could have executive air-condition offices, private secretary or even messengers and reserved parking spaces, and could belong to prestigious clubs and association, be entitled to free lunch. These help to boast their ego as they are looked upon as being successful. Therefore, if education at the technical college level will be restored to acceptable level, hygiene-motivator principles must be applied in the administration for the purpose of getting teachers to have satisfaction from their job (Ariwerikuma, 1986 cited in Miller, 2011).

4. Poor Professional, Personal and Public Image:

While the general attitudes of the public towards technical education and technical teachers have been found to be negative, the teachers themselves act and talk that way instead of reorienting and correcting the misconceptions that the public have about technical education. The general public must be made to recognize that technical teachers are the backbone of any nation for technological development (Miller, 2011).

5. Lack of Well Equipped Library for Research Work/Project:

Technical College Teachers that are ready to carry out some research work/projects cannot do this successfully because the libraries are not stocked with up-to-date textbooks and periodicals in their area of specialization. Where the textbooks are available locally, the teachers could not afford them because of meager salaries. Therefore, the technical teachers may not be motivated to embark on any project that will be useful to society

6. Frequent Curriculum Change in Technical Colleges:

With the establishment of National Business and Technical Education. Board (NABTEB) few years ago all technical colleges are mandated to use the curriculum developed by NABTEB which differs from the former West African Examinations Council (WAEC) technical syllabus. The curriculum is very comprehensive and has more courses. This according to Ekpenyong in Miller (2011), this means that the technical college must be versatile in their areas and in the general and science education courses.

7. Lack of Well-Articulated In-services Education Programme for Technical Teachers:

It has been observed that some of the technical college teachers do not have any teaching qualification and no provision has been made for them by the employers in this area to serve as incentives for these teachers. They should be encouraged to attend some vocational teacher education programme during long vocations to equip them as professional teachers.

8. In-sufficient University Admission for Training of Technical College Teachers:

University admission either on full-time or part-time basis for technical teachers at bachelor, master's and doctorate levels are not sufficient. There are only few universities in Nigeria that offer technical education and thus admitting only a few selected out of a great number that apply each year. The technical college teacher with all their predicaments play vital role in the overall development of this nation as they continue to strive harder with available resources to mould Nigeria's tomorrow technological base and development by imparting and training the Nigerian child to be self employed, self reliant, and also provide the technological background for students that would want to become technologists or engineers for the good of Nigeria (Miller, 2011).

Okwori (2012) citing Sara posited that more than 60% of the staff teaching woodwork technology could not perform the skills or provide technical services they were expected to teach others despite their high level paper qualifications. This

is of course due to non-skill acquisition from their respective institutions of higher learning. This view was buttressed when Pam (2004) postulated that Nigerian educational pursuits have been bogged down by a myriad of problems such as insufficient and poor physical structures and lack of training materials.

Challenges of Technical and Vocational Education in Nigeria

The challenges or problems militating against the implementation of vocational and technical education are:

1) Funding:

Universities in Nigeria are owned and funded by the Federal Government, state government and private individuals. Over the years, government subventions to universities have never been adequate but at the same time governments maintain the policy that universities should not charge fees it deemed adequate to complement the financial effort of the government. In Nigeria, the allocation to education as a share of the GDP is quite minimal. Till date, government funding of vocational and technical education programmes have not been impressive.

2) Facilities:

Most technical education departments in Nigerian universities do not have laboratories or workshops space let alone usable equipment and facilities and where they exist, they are grossly inadequate, as the laboratories only have the items or equipment that were provided when the departments were established. It is however most surprising to know that most technical education departments still depends on engineering workshop and lecturers to teach technical education concepts in this 21st century. The available facilities, programme as at today are inadequate quantitatively and qualitatively and besides they are obsolete.

Oryem-Oriya in Daso (2012) indicated that only 40% of institutions of Higher Education in Nigeria have laboratory or workshop space for technical education programmes. The others, 60% do not have laboratory or workshop space and that this reflects the low quality of technology programmes in higher institutions. He further noted that these few universities that have laboratories,

experience acute shortage of laboratory equipment and supplies. Oryem-Oriya concluded that this situation is partly responsible for the reason it has been increasingly difficult to run experiments effectively for students and has made the teaching and research in science and technology difficult and therefore the country was producing insufficient and ill-prepared technical education graduates necessary for driving the technological and socio-economic development of Nigeria as a nation.

The inadequacy in teaching, laboratory and workshop facilities has contributed to the diminution of the quality of technical education graduates in Nigeria. Daso (2012) citing Reyes – Guerra categorized students into three, namely: verbalizers, visualizers and doers. The verbalizers are those who learn easily if information is in written or spoken form. They benefit from lectures, tutorials and hand-outs. Visualizers learn easily when information is presented in pictorial or diagrammatic form while the Doers learn more easily when information is presented by practical demonstration by the lecturers. However, the inadequacy of facilities both qualitatively and quantitatively has put the visualizers and the Doers at a disadvantage. The verbalizers may also have problem in a class with large students' population. The implication of this scenario is that only a small proportion of the students benefit from the current pedagogical system (Daso, 2012).

3. Brain Drain:

In the context of this paper, brain drain refers to the movement of lecturers of technical education which are needed for the socio-economic and technological advancement of Nigeria from one university to other universities or to other professionals (including politics) calling for better conditions of service. Akintunde (1989) identified five different components of brain drain:

a) Experts in academics who moved to the industry where they get better pay for their services.

b) Lecturers and students who leave the country to acquire more knowledge and skill but later refused to return.

c) Lecturers who move from one country to another for other conditions of service.

d) Skilled professionals who abandon the practice of technical education in favour of other more lucrative economic activities and political appointments which are not related to their training.

e) Skilled professionals, although in their field of training who do not devote their full attention to their job because of their effort to supplement their earnings through other unrelated economic activities.

Bassi as cited by Daso (2012) reported that:

(i) About 45% of all Nigerian professionals including technical educators have left the Nigerian shores over the decades since colonization.

(ii) Between 1997 and 2007 alone, Nigeria lost over 10,000 middle level and high-level managers to the western economies.

(iii) About 500 lecturers from Nigerian universities continue to emigrate each year, particularly to Europe, America and other African countries where the condition of service is relatively better. These Nigerians in Diaspora contribute 35 times more wealth to Europe, America and other African economy.

4. Staff Training and Retention:

The training of academic staff is ordinarily a continuous exercise to ensure consistent improvement in the quality of their outputs. The training is two-fold: training to acquire minimum qualification (Ph.D) to teach and continued professional training. Both types of training can be acquired either locally or overseas. Usually, local training within the nation is cheaper than overseas training but more strenuous because of inadequate facilities, literature and distractions arising from the need to meet the necessary demands. Overseas training requires a lot of foreign exchange but the enabling environment exists to achieve success in a record time. However, over time it has always been difficult to get the trainees back to their respective countries after the completion of their study (Daso, 2012).

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

5. Staff Situation:

Many universities across the country are inadequately staffed both qualitatively and quantitatively. In most departments especially in technical education programme, the proportion of staff without Ph.D out numbers those with Ph.D. Uwaifo (2005) asserted that it is difficult to get people trained to the level of Ph.D because academic is not as attractive and commensurate to the effort, commitment and finances put in to acquire it; whereas a first degree graduate can function well in the industry and politics etc and earn good money.

6. The Curriculum of Technical Education:

The curriculum of a subject with practical content is generally organized into an average of 67% for the theoretical classes and 33% for laboratory. Students also use the laboratory to develop case examples on their own time. Olunloyo (2002) noted that one of the issues confronting the design of appropriate curriculum for technical education is preparing students for the shift from the analog to ICT paradigm in technology practice.

The slow pace of industrialization and technological growth in Nigeria can be attributed to the widening gap between science and technology as a result of the inability of technical education to adequately utilize the scientific ideas to promote technology. This suggests the need to overhaul technical education curricula in Nigeria. However, the overhauling of the curricula may not necessarily translate to the production of highly literate technical education experts of ready-made graduates for the industry which may result in rapid industrialization or growth in the economy of a nation unless solutions are proffered to some constraints that may

militate against positive outcomes, but will adequately equip our youths with the relevant skills needed for their day to day living.

According to Daso (2012), the problems associated with the current curricula are:

(i) They are based on a foreign model which has evolved under ideal conditions (staff, equipment, infrastructure, training opportunities etc) that are not easily duplicated in developing countries.

(ii) There is a basic lack of textbooks in this area and most of the available textbooks are often illustrated with examples from outside the local environment and which are irrelevant to the particular country.

(iii) There is usually a shortage of highly competent indigenous teaching and support staff with sufficiently wide practical experience of technology.

(iv) The curricular are adjudged to be too academic and overloaded with intellectual content in pure science and mathematics at the expense of basic engineering and technology (Daso, 2012).

(v) Inadequate provision for humanities, social sciences, business management concepts and entrepreneurial skills development. Because of the inadequate preparation of the students for the industry some employers retrain the graduate to make them productive in their organizations (Daso, 2012).

(vi) The teaching approach follows the conventional method of transfering knowledge across through the lecturer reading out to students, who would then take down notes. The educational system continues to place considerable value on this method of teaching (Daso, 2012).

7. The Apathy of Political Office Holders/Law Makers:

Education generally, including technical education programmes has been grossly neglected in Nigeria. Technical educators have the greatest challenge of convincing the law makers on why they should give priority to the programme in allocating resources. Many options of getting positive results have been advocated

at different fora, namely, lobbying, participation of technical educators in governance, wooing etc. Yet the government is playing a lopsided attitude to the proper development of the programme in Nigeria. Thus, Nigeria will ever remain a technologically backward and dependent nation if this attitude and trend is not reversed (Daso, 2012).

Current Status of Technical Education in Africa

Technical education systems in Africa differ from country to country and are delivered at different levels in different types of institutions, including technical and vocational schools (both public and private), polytechnics, enterprises, and apprenticeship training centres. In West Africa in particular, traditional apprenticeship offers the largest opportunity for the acquisition of employable skills in the informal sector. In Ghana, the informal sector accounts for more than 90 percent of all skills training in the country (African Union, 2007).

In all of Sub-Saharan Africa, formal technical education programmes are school-based. In some countries, training models follow those of the colonial power. In general however, students enter the technical education track at the end of primary school, corresponding to 6 – 8 years of education as in countries like Burkina Faso and Kenya, or at the end of lower or junior secondary school, which corresponds to 9 – 12 years of what is called basic education in countries like Ghana, Nigeria, Mali and Swaziland.

According to African Union (2007), the duration of school-based technical education is between three and six years, depending on the country and the model. Some countries like Ghana, Senegal, and Swaziland in an attempt to expose young people to pre-employment skills have incorporated basic vocational skills into the lower or junior secondary school curriculum. Oversight responsibility for technical education is shared in general between the ministries responsible for education or technical education and labour or employment, although some specialised vocational training programmes (in agriculture, health, transport, etc.) fall under the supervision of the sector ministries.

With a few exceptions, the socio-economic environment and the contextual framework in which technical education delivery systems currently operate on the continent is characterised, in general, by:

i. Weak national economies, high population growth, and a growing labour force;

ii. Shrinking or stagnant wage employment opportunities especially in the industrial sector;

iii. Huge numbers of poorly educated, unskilled and unemployed youth;

iv. Uncoordinated, unregulated and fragmented delivery systems;

v. Low quality;

vi. Geographical, gender and economic inequities;

vii. Poor public perception;

viii. Weak monitoring and evaluation mechanisms, and

ix. Inadequate financing, poor management and ill-adapted organisational structures.

Technical education in Africa is delivered by both government and private providers, which include for-profit institutions and non-profit, NGO and Church-based institutions. In almost all countries, non-government provision of technical education is on the increase both in terms of number of institutions and student numbers. This trend is linked to the fact that private providers train for the informal sector (which is an expanding job market all over Africa) while public institutions train mostly for the more or less stagnant industrial sector. Private providers also target “soft” business and service sector skills like secretarial practice, cookery, and dressmaking that do not require huge capital outlays to deliver. A limited amount of in-company or enterprise-based training also takes place in some countries; however, this type of training is often dedicated to the sharpening of specific skills of company employees.

Trade Course in Nigeria Technical Colleges

According to FRN (2004), the ranges of courses/trades in the Nigeria technical colleges shall be and not limited to: Mechanical, Computer Craft Practice, Electrical Engineering, Building Construction, Woodwork, Hospitality, Textile, Printing, Beauty Culture, and Business.

Resources for Teaching and Learning Woodwork in Technical Colleges

Resources in education mean human and materials, which the school can use to achieve educational goals and objectives. Oloyede (2003) classified educational resources into human and material resources. In terms of human resources required in schools, the most important are the teachers and the students. Human resource indicators include staff strength, teacher quantity, quality, qualification, and experience, while material resources include physical size of a school, physical facilities, and instructional facilities such as library, laboratories, and workshops. Educational facilities refer to non-human and non-financial resources. They also include all movable and immovable materials, which are used for teaching, learning and other school activities. They are synonymous with schoo1 physical facilities, school material resources, and school plant and school facilities. Olagboye (2004) stated that educational facilities consist of instructional resources such as audio and visual aids, graphics, printed materials. display materials and consumable materials. They also include physical resources such as land, building, furniture, equipment, machinery, vehicles, electricity and water supply infrastructure.

Teaching learning resources are all the things used by the teacher during teaching to aid understanding and make teaching successful and effective. They include modern textbooks, equipment, consumables like chemicals and reagents, models, charts e.t.c. and the physical learning environments which include the science classrooms and laboratories (Omorogbe & Ewansiha**,** 2013). In another dimension Ojedele (2004) identified three components of educational facilities. These are school infrastructure, such as buildings and playgrounds; instructional Facilities (teaching-learning materials, equipment and furniture) and school physical environment (beautification of the school environment).Thus, here are the different kinds of woodwork technology resources that are used for implementing woodwork

technology education curriculum in government technical colleges as prescribed by the National Board for Technical Education (NBTE).

i. Human resources for teaching and learning woodwork technology are the technical teachers, workshop attendants, and cleaners.

ii. Infrastructure is generally defined as the physical framework of facilities through which goods and services are provided to the public (Deepika, 2002). Infrastructural facilities include classroom blocks, wood workshops, store, library, staff office, toilet, and bore hole.

iii. Library Resources include woodwork textbooks, teacher guide, and woodwork curriculum.

iv. Utilities include extinguishers, workbench, and first aid box.

v. Hand tool is any tool that is not a power tool – that is, one powered by hand (manual labour) rather than by an engine. Woodworking hand tools are wide variety of non-powered devices used in woodwork technology. Woodworking hand tools include: paint brushes (various sizes), marking guage/mortise guage, marking knives, try square, mitre square, sliding bevel, measuring tape (metric), jack plane, smoothing plane, rebate plane, multi plough plane, spoke shaves (straight/round), rip saw, crosscut/handsaw, tenon saw, panel saw, coping saw, keyhole saw, dovetail/bak saw, sets of firmer chisel, sets of mortise chisel, sets of turning chisel, sets of twists bits, counters ink, rose, rachet braces, breast drills, sets of drill bits, sets of screw drivers, mallet, claw hammer, pein hammer, warington hammer, bradawl, pincers, f-cramp, sash cramp, g-cramp, bench-hold fast, sets of triangular files, flat files, scraper (flat), dividers, sets of round files, ½ round files, scraper (cabinet), and calipers (set) inside and outside, dowelling jig, and rasps.

vi. A woodworking machine is a machine that is used to process wood. These machines are usually powered by electric motors and are used extensively in woodworking. Sometimes grinding machines (for grinding woodworking tools) are also considered a part of woodworking machinery (Wikipedia, n.d).These machines are used both in small-scale commercial production of timber products and by hobbyists. Most of these machines may be used on

solid timber and on composite products. Machines can be divided into the bigger stationary machines where the machine remains stationary while the material is moved over the machine, and hand-held power tools, where the tool is moved over the material. Hand-held power tools includes: Biscuit joiner, Domino jointer, Chain saw, Hand-held circular saw, Electric drill, Jig saw, Miter saw, Nail gun, Hand-held electric plane, Reciprocating saw, Rotary tool, Router, Hand-held sanders, including belt sander, orbital sander, random orbit sander. While Stationary machines include: Bandsaw, Combination machine, Double side planer, Four sided planer or timber sizer, Drill press, Drum sander, Bench grinder, Jointer, Wood lathe, Mortiser, Panel saw, Pin router, Radial arm saw, Scroll saw, Spindle moulder (Wood shaper), Stationary sanders, including stroke sanders, oscillating spindle sander, belt sander, disc sander (and combination disc-belt sander), Table saw, Tenoner or tenoning machine, Thicknesser or Thickness planer, Round pole milling machine, and Round pole sanding machine.

vii. Consumable materials include wood, nails of various sizes, wood glue, plyboard, sand paper, paint, and tiner.

Expected Standard of Resources for Teaching and Learning Woodwork in Technical Colleges in Nigeria

The standard for the implementation of technical education programme (woodwork technology programme inclusive) is set by the National Board for Technical Education (NBTE). In setting standards both human and material resources are given consideration. The human resource required for implementing woodwork technology programme are qualified technical education teacher with at least a degree in technical education (B.Sc. (Ed) Technical Education) or higher national diploma in woodwork technology (HND Woodwork Technology) in addition to certificate in education (NCE,or PGDE). Also required is qualified woodwork technician/ machinist who should possess at least national technical certificate (NTC) in woodwork. A woodwork shop attendant is needed to take care of the workshop. The workshop attendant should possess apprenticeship certificate in woodwork technology and at least a First School Leaving Certificate (FSLC). On the other hand, material resources for implementing woodwork technology

programme include infrastructural facilities, hand tools, power hand tools, woodwork machines, and consumable materials. However, the infrastructural facilities required for effective woodwork technology programme are well furnished classroom blocks, well furnished staff office, well equipped woodwork laboratory, adequate power supply, staff and student toilet, adequate water supply and workbench. For proper understanding of the expected standard of resources required for effective implementation of woodwork technology programme as prescribed by the NBTE see Appendix A.

Challenges of Implementing Woodwork Curriculum in Nigerian Technical Colleges

The challenges of implementing woodwork curriculum in Nigerian technical colleges are synonymous with the problems of general education in Nigeria. Egwu (2009) posited that some of the major challenges of the Nigerian education system (woodwork technology education inclusive) includes;

i. inadequate and obsolete infrastructure and equipment, for example poorly equipped woodwork technology education workshop and libraries, dilapidated classroom blocks.

ii. inadequate capacity in the institutions for internal/peer quality assessment.

iii. Weak support structure for students Industrial Work Experience Scheme (SIWES)

iv. brain drain, human capital flight

v. high incidence of cultism, examination malpractice and social and academic vices.

vi. unstable academic calendar

vii. staff shortages across board

viii. unattractive conditions of service for technical college teachers

ix. inadequate funding of educational institutions.

x. inadequate collaboration between educational institutions and organized private sector.

However, Udoka (2010), opined that the major challenge is funding. In same vein, Yusuf and Soyemi (2012), posited that inadequate financing is one of the problems of implementing technical education curriculum (woodwork technology curriculum inclusive) in technical colleges. Furthermore, Okoroafor (2010), also noted that; some of the problems of implementing technical education curriculum include;

i. Lack of sponsorship: Management of educational institutions find it difficult to sponsor the technical teachers/lecturers to seminars, conferences, and short courses claiming that there is lack of fund. This has reduced the rate at which the technical teachers/lecturers are upgraded.

ii. Inadequate infrastructure: Technical teachers/lecturers do not have the opportunity to put what they have learnt into practice due to lack of infrastructure.

iii. Inadequate Timing: Time should be provided for technical teachers/lecturers to go and upgrade themselves. Work load should not be so demanding that they preclude technical teachers/lecturers from research and time to develop new skills, abilities and knowledge through research and innovation.

iv. Lack of reward for excellence.

However, Nwogu and Nwanoruo (2011), stated that the challenges of technical education are numerous, which include lack of skilled manpower; acute shortage of technical teachers; and poor funding of technical education. Consequently, Olaitan in Odu (2011) posited that the following challenges confront the implementation of Technical Teacher Training Programme in Nigeria. These include insufficient material resources for training; dearth of qualified TVET educators; and the use of the quota system for selection of students in TVET teachers training programme.

In same vein Odu (2011) stated that, some of the challenges of Human Capital Development include inadequate funding; poor workshop organization; and inadequate instructional materials. Others challenges as posited by Okebukola (2012), include teachers inadequacies; funding inadequacies; gross Inadequacies in facilities; harsh and intimidating classroom; poor quality preparation of lesson by TVET teachers; resource inadequacy; unhealthy classroom; shortage of equipment; and social vices. According to Mohammed (2005), one of the problems of Technical and Vocational Education in Nigeria is the lack of motivated teachers and the reason for this lack of motivation could easily be traced to the low esteem of the teachers. More so, Onjewu (n.d.) posited that the lack of funds on the other hand affects other essentials needed in the implementation of technical education like the provision of teaching aids, furnishing of offices, laboratories, workshops and even basic infrastructures like classroom, seats and tables, so that a common sight to find students of architecture for instance sharing a table where each ideally should have one because of the technical nature of their course.

Ekpenyong (2011) posited that, there are a number of factors, which have in various proportions impeded the smooth implementation of the goals and objectives of technical education. Some of the outstanding factors affecting the implementation of technical education include inadequate supply of technical teachers and equipment, misinterpretation of policy and public perception of technical education, technical college-industry relationship problem, poor condition of services of technical teachers, and inadequate guidance and placement services for technical students. Accordingly, the National Board for Technical Education (NBTE, 2011), opined that, the underlining challenges of technical education sector include; low societal recognition, which translate to low enrolment and inadequate skilled workforce, obsolete instructional facility, inadequate funding, poor staffing, poor linkages with industry and general deficiency in quality. In addition, evaluation in all sectors of education tends to be by conventional examinations, which generally does not factor in practical techniques in the industry.

There are numerous challenges facing technical education in Nigeria. According to Aigbepele (2011) these challenges include;

i. Negative public attitude towards technical education. Aigbepele further stated that, most people see technical education as inferior and therefore will not want their ward to go into profession.

ii. Inadequate basic infrastructure facilities, workshops and laboratory.

iii. Inadequate funding of technical education.

iv. Inadequate and ill-equipped technical education staff.

v. Irregular review of the curriculum for technical education.

Similarly, Lilly and Efajemue (2011) reported that there are many challenges worthy of noting. Some of these challenges include; poor planning, obsolete curricular/infrastructure, very low enrollment, very poor teaching learning environment, and poor quality of academic staff, poor library facilities, poorly/ill equipped laboratories and lack of political will. Also, Okorafor and Okorafor (2012) stated that poor implementation, low enrollment, gender disparity, quality of infrastructure and poor public perception are constrains and challenges of technical education in Nigeria.

Gwarzo in Okwori (2012) disclosed that lack of equipment in schools will make our students not to have ample opportunities to see and manipulate them in order to acquire the necessary knowledge and skills while Imarhiagbe (1998) further explained that inadequate physical facilities in wood workshops are taking a heavy toll on the quality of graduates produced. According to Okwori (2012) physical facilities such as workshops, machines and tools are not enough. These inadequacies affect students' performance in both theory and practical work. This means that the objectives of technical education will be difficult to achieve.

Moreso, the general problems of technical education in Nigeria include: limited resources, lack of guidance services, inadequate training of technical teachers and the lack of teaching resources (Moja, 2000, Olumese, 2002; and Nwokomah; 2005). Other challenges according to Yusuff and Soyemi (2012) includes, low quality training, mismatch between training and labour market, skill discrimination against graduates of technical schools, low enrollment at all levels of

technical education, weak monitoring and evaluation and inadequate financing. Uwaifo and Uwaifo (2009) reported that the problems of training technical education teachers in Nigeria are funding problem, inadequate physical/material resources, mal-administration, insufficient and poorly qualified technical staff, gross neglect of technical education, and poor training and re-training programme.

Scholars have identified major problems facing technical colleges from various assessment studies to ascertain the status of human and material resources for teaching and learning trade courses (woodwork inclusive). In support, Okorie (2000) reported adequate training facilities, qualified technical instructors and funding are becoming very scarce in training institutions. In Nigeria, technical colleges are hardly able to get enough instructors and fund to render their facilities to keep pace with technological progress. However, infrastructures in technical colleges today reveal that some schools do not even have a defined workshop where students can practice what they learn (Boyi , 2008). Some buildings have had their roofs removed, windows and doors pulled out, no desks for students to sit comfortably and learn.

A critical assessment of government technical colleges in Nigeria revealed that some machines supplied by the federal government as far back as 1982 to technical colleges are still lying in crates (in some cases outside) for lack of workshops to install them. Parts of these machines have depreciated; others have disappeared over night or converted to personal use by domestic thieves (Ekunke, 2008). In some cases, the few machines available have become too old to be used or have broken down due to lack of maintenance. Facilities that are functioning have no electricity to power them.

Aggarwal (2006) commenting on the vital role of the teacher puts it succinctly by positing that premises and equipment are needed in the education enterprise and persons are vital to them and a teacher is the supreme factor. There is no exaggeration that a spacious building, costly equipment, and a sound syllabus will serve some useful purpose only when there are teachers who are fully alive to the nobility of the profession and its accompanying responsibilities. In the same vein Buseri (2010) posited that to meet up with the rapid scientific progress in

technology requires the presence of well trained, efficient, knowledgeable and skillful teachers who are versatile in the discharge of their duties and responsibilities. In Nigeria, the Federal Government does not mince words when it declared that "no education system can rise above the quality of its teachers (FRN, 2004).

The availability of adequate and qualified teachers cannot be compromised for the success of woodwork technology education in government technical colleges in Nigeria. Federal Ministry of Education, Science and Technology 1985 decided to enhance the academic performance of students in different institution by equipping the schools with standard equipment (Umunadi, 2009). Okoro in Umunadi (2011), stated that facilities which include the buildings, equipment, tools and school materials available are inadequate for effective use in schools. One of the major problems in technical colleges in Nigeria is lack of materials and equipment. In same vein Oranu (1990) stated that lack of physical facilities is the problems of educational institutions (technical colleges inclusive) in Nigeria. On the problems existing in the schools and the system of education, it is lack of materials and necessary equipment in teaching science and technology subjects (Aromolaran, in Umunadi, 2009).

Review of Related Theoretical Studies

Despite importance of human and material resources in the teaching and learning of woodwork technology education in technical colleges in Nigeria, there have been cases of inadequate human and material resources for teaching and learning in government technical colleges. In support, Ekpenyong in Miller (2011), posited that technical education are being crippled by lack of funds and inadequate infrastructures in government technical colleges. Aromolaran as cited by Umunadi (2009), noted that the lack of material and equipment was a significant problem in the Nigerian education system (technical colleges inclusive).

Most technical colleges in Nigeria are generally ill-equipped for instruction. There are lack good seats and lockers for students to write, and are overcrowded. The standard for learning space is not maintained, teachers seats and staff rooms are out of place, most shutters and doors are already broken to the extent that teachers

and student are exposed to danger in hot and cold weather. The facilities that could facilitate learning are not in place (Olaniyonu, 2006). Olaniyonu further pointed out the level of deterioration of standard of schools when Olaniyonu posited that, most of the school buildings today were built some thirty to forty years ago and cannot last for the next fifteen years, because they have not been maintained over the years and are now very old and weak. Apart from not presenting conducive environment for teaching and learning they are death traps for our children whose lives are put at risks. In fact, there have been cases where students lost their lives and some got seriously injured as a result of collapsed of school buildings.

Also, there are situations where skilled personnel are available but no material resources. In some educational institutions, the few resources that are available are old and not properly installed due to lack of funds. There are instances where some resources are available but the teachers are not able to utilize them in teaching and learning process as a result of lack of skills. Also in some of these technical colleges, some modern equipment such as sophisticated sewing machines, computer machines, and wood cutters amongst others are not used by teachers because of their inability to use them (Akinfolarin, Ajayi, & Oloruntegbe,2012).

Puyate (2002) maintained that the present state of technical education facilities in technical colleges is very poor, there is no planned means of maintenance of the already broken down equipment or means of purchasing new ones, there is little or no concern on the part of government, teachers and students for the improvement of the present state of facilities. This pathetic situation needs to be reverted in order to meet the goals of technical and vocational education as enshrined in the National Policy on Education of Nigeria. At all levels of the nation's educational system and for all known and existing school types, instructional resources or teaching and learning materials are an indispensable factor in the attainment of goals (Mkpa, 2001).

The study conducted by Onyejemezi (2001) on quality, quantity, production and distribution of teaching resources/facilities revealed that educational institutions are hardly supported with educational resources, even in the face of 'Accreditation fever'. Resource support from foreign countries is no longer available to Nigeria

schools. The extent of the deterioration of educational structures such as physical plants, infrastructures and facilities, where these educational structures are available, is amazing. In many schools, the non-availability of these facilities is more striking than their condition (Nnoli, 2001).

Imarhiagbe (1998) further explained that inadequate physical facilities in wood workshops are taking a heavy toll on the quality of graduates produced. Olumese (2004) quoted previous report of National Board for Technical Education (NBTE), as revealing that after visiting ninety one (91) technical colleges across the country to assess their facilities, it was discovered that eight or 1.5 percent had adequate equipment. Musa (1993) decried the level of inadequacy in infrastructural provisions in our technical vocational institutions. Musa further stated that there have been cases where technical students graduate without tools and machines.

Offorma (2005) quoted Nwagwu noting that vocational and technical subjects are not effectively implemented as most of the subjects are not offered due to lack of teachers, workshops for practical work, and further noted that where there are teachers the delivery is usually theorized because of lack of competence on the part of the teacher or due to lack of equipment, thus students graduate without any hands-on experience.

On the factors that can be attributed to the cause of poor implementation of Nigeria curriculum at the secondary school level, Anyanwu (2000) tested a hypothesis which stated that ‘there will be no significant relationship between teaching method and implementation of Nigeria secondary curriculum’. 150 participants were involved in the study and the Pearson Product Moment Statistics was used to check if there is a significant relationship between the methods applied by teachers in the class and the consequent implementation of the school curriculum. The result indicated a positive relationship between teaching method and curriculum implementation. The implication of this result is that teachers as one of the main stakeholders of the school curriculum do not seem to promote the effective implementation of Nigeria secondary school curriculum, due to many factors ranging from lack of specialist teachers to lack of teaching materials and non-availability of equipment in the school.

In a similar study by Putsoa (2005), the foremost factors affecting the effective implementation of technical education objectives were also inadequate instructional equipment and the lack of up-to-date school plants. Also, Yusuf (2006) reported that facilities in vocational and technical schools were scarcely available, grossly inadequate and most of them in poor condition. Earlier studies by Ogushi (2008) found that the problems faced by education administrators in the implementation of vocational education programmes in Nigeria include, among other things, incompetent technology teachers.

Nweke (1989), Nwokolo (1993), Ibeneme (1994) discovered that the discrepancy between school workshop facilities and the actual work facilities may adequately account for the amount of retraining given to Nigerian university graduates before they can effectively perform in the industries. Also, Puyate (2006), reported that most of the equipments, tools, and workshop facilities are either broken down or damaged or dilapidated. Towe (2007) also reported that there was no evidence of practical work in a course which was supposed to introduce students to various skill-based programmes. Even where workshop and laboratories were available, they were deprived of functional essential tools, equipment and materials. Consequently programmes that are supposed to be practical are implemented on chalkboards.

Fajemirokan (1999) observed that instructional materials are either inadequate in quantity or are obsolete in quality and use. Odusanya (1999) in his study came to the conclusion that teaching of skill- based courses was more theory oriented than a practical oriented one in Nigerian schools. Reasons for this were that tools and equipment were not adequately supplied to go round the students in the practical classes. Accordingly, Olumese (2004), opined that previous report of NBTE which revealed that after visiting ninety-one (91) technical colleges across the country to assess their facilities, it was discovered that eight (8) had adequate equipment.

This above assertion is in line with the work of Abdullahi (2003) that every training school faces the problem of providing and maintaining suitable workshop and appropriate facilities for technical and vocational training programmes. These

findings were also supported by Moja (2000) that the problems of Technical and Vocational Education (TVE) in Nigeria are made worse by the poor condition/inadequacy of training facilities. Adequate workshop facilities are necessary for any quality learning to take place. Facilities aid the instructors to communicate more effectively and the learners to learn more interestingly, meaningfully and permanently.

According to Osarenren-Osaghae and Irabor (2012), in 1997, a survey report by the National Education Research Development (NERD) of the state of demand and supply of science and technology teachers nationwide indicated that about 320,000 representing 88% of the total needs were not available in 23 different subjects. A similar survey by NERD (2004) in respect of polytechnics indicated a shortfall of 88%. This is in line with Agbenten (1985) who discovered that shortage of qualified teachers is a worldwide phenomena but more obvious in the developing countries where educational system are constantly expanding without sufficiency of qualified teachers.

In support of this statement, Udofort (1994) lamented that insufficient qualified sciences and technology teachers in schools have often resulted in the employment of unqualified people and this de-motivates the students through bad teaching. Aina (2000) states that the quality and quantity of teachers in the schools have contributed immensely to the high failure rates being experienced in the programmes run by National Business and Technical Examination Board (NABTEB) certificate examinations.

In a study carried out by Edobor (2007) regarding the availability of human and material resources in vocational courses, in secondary schools in the south-eastern parts of Nigeria, the discoveries were in line with Odunsanya (2006), Aina (2000) and NERD in Osarenren-Osaghae and Irabor (2012), confirming the inadequacy of human and material resources in the teaching and learning of vocational courses. In same vein, Omorogbe and Ewansiha (2013) citing Ogunmade stated that majority of students does not have textbooks and most of the schools do not have libraries and where they have one, the textbooks in the libraries are outdated. However, in most of our schools, there are no facilities for the teachers to

demonstrate phenomena, let alone allow the students to have opportunities for finding out things for themselves (Audu & Oghogho, in Omorogbe & Ewansiha, 2013).

Review of Related Empirical Studies

Several researches have been carried out to assessed resources in educational institutions in Nigeria. Notable among these research include the research of Awurum (2005) titled "Analysis of Resources for Teaching and Learning of Block-laying and Concreting Work at the Technical Colleges Level in Edo and Delta State". This study revealed that, the respondents agreed on a total of five (5) items as adequate human resources for teaching and learning of block-laying and concreting work while they disagreed with ten (10) items and adjudged as not adequate. However, the overall mean score of all the items was 2.45, which is less than 2.50 which is the decision point, this showed that human resources were not adequate for teaching and learning of block-laying and concreting work in the technical colleges.

Furthermore, the study revealed that, the respondents agreed on a total of four (4) items as adequate material resources while sixteen (16) items were adjourned as inadequate. The total mean score of all the items was 2.15, which is less than 2.50 for the decision. This showed that material resources are not adequate for teaching and learning of block-laying and concreting work in Edo and Delta State technical colleges. In same vein, the study revealed that human and material resources available in the technical colleges did not meet the National Board for Technical Education (NBTE) minimum standard requirement for teaching and learning of block-laying and concreting. In addition, the study revealed that, there are shortage of academic and support staffs, majority of academic staffs possessed low academic qualification, most of the available equipment for teaching and learning block-laying and concreting work are obsolete and not functional, most of the schools have no functional block-laying and concreting workshops, inadequate supply of water and electricity, out dated textbooks, and inadequate number of hand tools. This study is related to the present study because it is aimed at assessing resources for in technical colleges in Edo and Delta State, but different in the sense

that, this present study was aimed at assessing resources for teaching and learning woodwork in Delta State technical colleges.

On a contrary, Akinfolarin, Ajayi, and Oloruntegbe (2012) in their study on "An Appraisal of Resource Utilization in Vocational and Technical Education in Selected Colleges of Education in South West Nigeria" The descriptive research of the survey type was used. The sample for the study was made up of 1,040 which in turn were made up of 40 heads of department; 200 lecturers and 800 students. The subjects were selected using stratified, purposive and simple random sampling techniques. Stratified random sampling technique was used to select eight (8) colleges of education in the south west Nigeria. (3 Federal and 5 States). Purposive sampling technique was used to select the heads of department; simple random sampling technique was used for lecturers and the students in school of Vocational and Technical Education in South West of Nigeria. Questionnaire and inventory were the instruments used for this study and were validated by experts in educational management and test and measurement. Also, data were analysed using percentages means and standard deviation. The study revealed that most of the required resources in Vocational Technical Education were available and adequate. This study is related to the present study because it is aimed at assessing the utilization of resources for in colleges of education, but different in the sense that, this present study was aimed at assessing resources for teaching and learning woodwork in Delta State technical colleges.

In similar study carried out by Bvekerwa, Chavunduka, Absalom, and Chinyemba (2011) titled "Appraisal of Resources for Technical and Vocational Subjects in Secondary Schools: A Study of Makonde District, Zimbabwe" The purpose of this case study was to investigate the availability of minimum required resources during the implementation of the policy. 4 research questions guided the study and the study was limited to the evaluation of the human and non-human resources in Public Secondary Schools in Makonde District, Mashonaland West Province during the implementation of technical and vocational subjects. The research design used was a case study and the population was all forty one (41) schools and a total of 54 teachers in Mashonaland West Province. The research instrument used was a questionnaire for teachers of technical and vocational

subjects. Statistical Package for the Social Sciences (SPSS) was used in this research for statistical analysis and data management. The findings revealed that there were inadequate material resources in secondary schools for the implementation of technical vocational subjects. It was recommended that the Ministry of Education, Sports and Culture implement a staff development programmes for teachers of technical subjects, there was need for a special presentation to the Ministry of Finance, so that an allocation from the National Budget be channeled towards the development of material resources.

Adeyemi (2008) carried out a study on "Availability of Teaching Manpower in Technical Colleges in Ondo and Ekiti States, Nigeria: A Comparative Analysis" Descriptive survey design was used, the study population comprised all the 5 technical colleges in Ondo State and the 4 technical colleges in Ekiti State. The sample was identical with the population as all the colleges were involved in the study. Two instruments were used to collect data for the study. These were the technical colleges' principals' inventory and the higher institutions teacher supply inventory. The data collected were analyzed using percentages and the t-test statistic. The study indicated that the bulk of the teachers in the technical colleges in the two states are teachers holding the Nigeria Certificate in Education (NCE Technical). This category of teachers accounted for more than fifty –five percent (55%) of all the teachers in the technical colleges in the two states. Graduate teachers with degrees were in small proportion compared to NCE teachers. They accounted for a proportion between thirty-one percent (31%) and thirty-five percent (35%) in technical colleges in Ondo State and between a proportion ranging from thirty eight percent (38%) and fourty-four percent (44%) in technical colleges in Ekiti State. This study is related to the present study since it was aimed at assessing the availability of teaching manpower in technical colleges in Ondo and Ekiti State, but different because, in addition to human resources, the present study assessed the material resources for teaching and learning woodwork in Delta State technical colleges.

Umunadi (2009) conducted a study on "Teacher Utilization of Instructional Equipment and Materials in Teaching Basic Electricity in Urban and Rural Technical Colleges" The study investigated the availability and usage of equipment

and materials in the teaching of basic electricity in urban and rural Delta state (Nigeria) technical colleges. The study sample was 150 students from urban schools and 50 students from rural schools to make a total sample of 200 students. Questionnaire was used for the data collection. Percentages, mean and standard deviation were used to analyze research results and z-test statistic was used to test the hypotheses. The hypotheses were tested at a 0.05 level of significance. The findings revealed among other things, that there are inadequate basic electricity equipment and consumable materials available in the technical colleges. In addition, teachers in technical colleges often fail to properly use the equipment, tools and materials needed in the teaching of the subject. Based on these findings, it was recommended that Government should provide qualified teachers, classrooms, workshop, equipment and necessary facilities in technical Colleges for effective teaching and learning of basic electricity. The previous study is related to this study because both of them focus on instructional facilities. However, the present study differ from the previous study because the previous study centered on Basic Electricity in Urban and Rural Technical Colleges in Delta State while the present study is purely on resources for teaching and learning woodwork in Delta State technical colleges. Also, while the researchers used only questionnaire in the previous research, this current research used the both checklist and questionnaire.

The research work of Osam (2013) on "Quantitative Analysis of Human and Material Resources in the Implementation of Vocational and Technical Education in Rivers State, Nigeria" revealed that at GTC Ahoada, there are 53 teachers of which 45 (84.9%) have qualifications ranging from NCE, National Diplomas and Degrees in Science and Technical Education, and are therefore qualified. Eight (8) (15.9%) did not possess these qualifications and so are not qualified. At FSTC Ahoada, there are 47 teachers, 35 (74.4%) of whom also had qualifications ranging from NCE, National Diplomas and Degrees in Science and Technical Education and are qualified, while 12 (25.5%) did not possess these qualifications and are not qualified. Of the 107 teachers at GTC Port Harcourt, 82 (76.6%) have qualifications ranging from NCE, National Diplomas and Degrees in Science and Technical Education and are qualified, while 25 (23.4%) did not have these qualifications and are not qualified. Of the 17 teachers at GTC Tombia, 12 (70.6%) are deemed to be

qualified based on their educational attainments, while 5 (29.4%) are not qualified in that they are working with less than standard qualifications. GTC Elo-ogu has a similar number of teachers and qualified/unqualified teachers as GTC Tombia.

However, these results show that larger percentage of the teachers in existing vocational and technical education programmes are qualified and moderately experienced and have met the teaching requirements as required by the National Policy on Education (FRN 2004). It became clear, however, in interviews with the principals that such teachers are not sufficiently provided for by the government. More so, the study revealed that the quality of academic staff in vocational and technical colleges in Rivers State is moderately high but relatively inadequate, and that some staffs are far less experienced. It is also evident from this study that some teachers do not have the requisite teaching qualifications even though they hold high degrees in the trade that they teach. On the other hand in terms of training facilities, the study revealed that there are shortages in equipment and other facilities needed for successful vocational skills acquisition training. The study revealed that some of the available facilities are not functional and/or in deplorable conditions. It is true that a few new structures and or repaired/renovated structures are slowly springing up in some schools as a result of the establishment of the government's Educational Trust Fund (ETF) and interventions by other government commissions (NDCC). The fact remains, however, that the pace of these developments is too slow. Discussions with the principals of the schools involved in this study reinforced the opinions of other respondents on the importance but lack of facilities for the implementation of vocational and technical education programmes in Rivers State. This situation is, in part, responsible for the poor quality of skills acquired in vocational schools as facility availability has a direct effect on the teaching and learning process (Osam, 2013). This study is related to the present study because it was aimed at assessing human and material resources in technical colleges in Rivers State, but different in the sense that the present study was conducted to assess only woodwork human and material resources using technical colleges in Delta State.

Okwori (2012), carried out a study on “An Assessment of Facilities used for Teaching Woodwork Technology at Federal College of Education, Pankshin,

Plateau State, Nigeria" The study accessed facilities used for teaching woodwork technology at Federal College of Education, Pankshin, Plateau State, Nigeria. Survey research design was adopted for the work. The inventory of wood workshop and Minimum Standard for Vocational and Technical Education produced by National Commission for Colleges of Education, Abuja, Nigeria were utilized for the study. 2 research questions guided the study and questionnaire was used for data collection and the data were analyzed using percentage. The findings of the study revealed that woodwork machines such as surface, bandsaw, universal woodworking machine, and drilling machines were available and adequate, while circular saw, wood lathe and accessories, radial circular saw, compressor and spraying unit, tenoner, mortise (chisel and chain), jigsaw machine, and pressor were not available. In addition, Okwori reported that among all the hand tools required for teaching woodwork, only grooving/ plough plane, bull nose plane, crosscut/ handsaw, tenon saw, and set of screw drivers were available and adequate. More so, the study revealed that maintenance equipment such as sharpening machine, oil cans, saw vices, glue spreader, glue brushes and glue heater were not available.

However, Asiyai (2012) conducted a research on "Assessing School Facilities in Public Secondary Schools in Delta State" The purpose of the study was to find out the state of the facilities, the types of maintenance carried out on the facilities by school administrators, the factors encouraging school facilities depreciation and the roles of school administrators in the management and maintenance of school facilities. The study employed the ex-post-facto research design. The questionnaire was the instrument for data collection from 640 respondents selected through stratified sampling techniques from all the 358 public secondary schools in the state. Findings revealed that school facilities in the schools are generally in a state of disrepair. The findings further revealed that the maintenance carried out on school facilities were inadequate for majority of the facilities. The factors encouraging school facilities deprecation included excess pressure on available facilities and delayed maintenance amongst others. The roles of school administrators in the management and maintenance of school facilities included periodic inspection of facilities and decentralization of maintenance. The study recommended that school administrators, teachers and students should

develop and inculcate good maintenance culture, government should budget for facilities maintenance and allocate more funds to schools for effective management and maintenance of school facilities. The study is related to the present study because it was aimed at assessing facilities in secondary schools in Delta State, but different from this study since this study was aimed at assessing human and material resources for teaching and learning woodwork in technical colleges in Delta State.

Ibrahim and Abdullahi (2010) in their research on "Repositioning the Facilities in Technical College Workshops for Efficiency: A Case Study of North Central Nigeria" A descriptive survey design was adopted. Two research questions were raised and one hypothesis was formulated to guide the study. A 35-item questionnaire was developed based on the National Board for Technical Education (NBTE) standards on Technical College workshops, and was validated by three experts. Data was collected from 101 administrators, 140 teachers, and 24 workshop personnel randomly sampled and stratified along trades in 19 Government Technical Colleges in North Central Nigeria. Mean was employed to answer the research questions while one-way analysis of variance (ANOVA) was employed to test the hypothesis using Statistical Package for Social Sciences (SPSS) for analysis. Results revealed that administrators, teachers, and workshop personnel shared similar views on inadequacy of facilities in Technical College workshops. It was therefore recommended that: The private sector should be encouraged to initiate and participate in the provision of facilities using such methods as build operate-and-transfer (BOT), build own-operate and transfer (BOOT) and rehabilitate-operate and transfer (ROT); special intervention funds should be set aside by Government for procurement of workshop facilities to technical colleges, such channels may include Education Tax Fund (ETF) as practiced in Nigeria; Non Governmental Organizations (NGOs), Parent Teacher Association (PTA), and Community Based Organizations (CBOs) should be asked for support in supplying relevant facilities to the workshops as obtained in some nations; and that a specific percentage of income tax generated annually by the Government should be utilized for provision of workshop facilities in technical colleges.

Adeyemi (1997) studied evaluation of the status of implementation of Vocational/Technical education programmes in the colleges of education in Osun,

Ondo, and Ekiti States. A structured questionnaire was administered to 112 respondents comprising all the lecturers in the department of Vocational Technical Education of Colleges of Education in these states. There was no sampling. Mean, mode, percentage and frequency distribution were used to answer research questions while t-test was employed to test the null hypotheses. The result of the study indicated that student/teacher ratio in the programmes of vocational and technical education is very poor. It also showed that human and material resources in each of the programme areas are inadequate. Although this study was conducted in colleges of education, it has some relationship with the present study in terms of poor student/teacher ratios and inadequacy in human and material resources development in technical institutions across the board (hierarchy). This study is related to the present study because it was aimed at evaluating the status of technical education programme, but different in the sense that why the study was conducted using colleges of education in Osun, Ekiti, and Ondo State, the present study was carried out using technical colleges in Delta State.

Bello and Babawuro (2013) conducted a study to assessed State of facilities for teaching electrical installation and maintenance work trade in technical colleges in Bauchi State, Nigeria. This study was carried out to assess the state of facilities available for teaching Electrical Installation and Maintenance Work Trade (EIMWT) in Bauchi State Technical Colleges. The design of the study consists of a descriptive survey. Three technical colleges were selected using stratified random sampling technique, one each from the three senatorial districts of Bauchi State (north, south and central) to serve as the sample for the study. The data collected using structured questionnaire and a checklist, were analyzed using frequency and simple percentage. Some of the findings of the study were that most of the facilities (tools, equipment and machines) in the workshops of the colleges are not functional. A poor maintenance culture on the side of the workshop technicians was also recorded. It was therefore, recommended that, all the broken down implements including the obsolete ones be repaired and/or replaced to promote effective skills acquisition and training in all the colleges. Also, modern workshop facilities should be procured. Special orientation on the operation and maintenance of the procured Workshop facilities should be organized as at when due to update the Instructors

and the Workshop technicians about proper handling of the facilities. Donor agencies such as PTA, UNDP, UNESCO, UNICEF, etc, should be encouraged to assist in equipping these modern facilities for necessary training to take place thereby, resolving the funding difficulty faced by the Vocational and Technical Colleges in the state to an extent. This study is related to the present study because it was aimed to assessed facilities in technical colleges, but different in the sense that while the study assessed facilities for teaching and learning electrical installation in technical colleges in Bauchi State, the present study assessed the human and material resources for teaching and learning woodwork in Delta State technical colleges.

Bulama (2001) conducted a study on Evaluation of Educational Facilities in State Technical Colleges in North Eastern Nigeria. The population of the study was made up of administrative staff (Principals, Vice Principals and H.O.D.s), technical teachers and final year students. Six technical colleges were randomly sampled, out of a total of 10 technical colleges in the six states. All the administrative staff, technical teachers and final year students in the six sampled colleges were used for the study. The instruments used were a questionnaire constructed with a five point rating scale, and two forms recommended for the collection of data for the computation of utilization factors. Five research questions were raised and six hypotheses formulated. The methods of analysis include means, standard deviation, Z-test of difference between two means and one way analysis of variance.

The analyses were carried out by means of SPSS MS Windows Release 6.0. Some major findings of the study revealed that contrary to reports and observations of some educationists there are enough building structures for the present population of students in all the six technical colleges. Respondents indicated that they are generally satisfied with the structural stability, floor space, ceiling heights and orientation of the buildings. However, furniture, especially in drawing studios and those used for storage purposes generally were found to be inadequate. Out of 21 spaces only four were found to have met the NBTE requirement for use factor of 0.8 for classrooms and 0.7 for workshops. This suggests that existing facilities are not effectively being put to use. Findings of this study which agreed with results of earlier studies showed that male and female students differ significantly in the way

they react to sensory comfort, particularly thermal comfort. It was also found that students and teachers require different comfort levels because of age difference and the activities they engage in, which are usually different for teachers and students. It was however found that tools, equipment and furniture are grossly inadequate, while utility services such as electricity and water are inadequate due to the location of the colleges in small rural towns. This study is related to the present study since the study was aimed at assessing facilities in technical colleges, but different because the present study was aimed at assessing human and material resources in Delta State technical colleges, while the later was carried out in North Eastern Nigeria.

Appraisal of Review of Related Literature

The review of related literature discussed the John Dewey Theory of Valuation as the theoretical framework for the study. Under the conceptual framework, Human and Material Resources Assessment model was discussed. Furthermore the conceptual framework were discussed under the following sub-headings: Assessment in Education, Assessment Process, Summative Assessment, Formative Assessment, Concept of Teaching and Learning, Concept of Technical Education, Historical Development of Technical Education in Nigeria, Objectives of Technical College Education, Problems of the Technical College Teacher, Challenges of Technical Vocational Education in Nigeria, Current Status of Technical Education in Africa, Resources for Teaching and Learning Woodwork Technology in Technical Colleges, Standard Expected of Resources for Teaching and Learning Woodwork Technology in Technical Colleges in Nigeria, Challenges of Implementing Woodwork Technology Education Curriculum in Nigerian Technical Colleges, and Review of Related Empirical Studies.

However, the review of related literature indicated that researches have been conducted to assess resources in technical colleges in other part of the country and other developing countries in Africa, but in Delta State no study known to the researcher has being carried out to assess resources for teaching and learning woodwork technology in government technical colleges. Furthermore, the results from these researches have produced controversial outcome since some researchers

reported that there are available resources for teaching and learning in technical colleges, others reported that the available resources for teaching and learning is inadequate. Consequently, majority of the researches are not conducted properly, since most of the researchers use only questionnaires to collect data and also the researchers do not personally observe the resources evaluated. In this study, the researcher used questionnaire and checklist developed based on NBTE required resources for teaching and learning woodwork technology in technical colleges to collect data personally from, principals, vice principals, and woodwork personnel including heads of department of woodwork technology in all the six technical colleges in Delta State. There is need to conduct this study due to the fact that no assessment study known to the researcher has been conducted to assess woodwork technology resources for teaching and learning in Delta State technical colleges. Hence, the findings from this assessment study will remain a reference point to researchers in the field of technical education and related field.

CHAPTER THREE

RESEARCH METHODS AND PROCEDURE

This chapter dealt with the following: Design of the Study, Population of the Study, Sample and Sampling Technique, Instrument for Data Collection, Validity of Instrument, Reliability of Instrument, Method of Data Collection, and Method of Data Analysis.

Design of the Study

Descriptive survey research design (quantitative and qualitative type) was used for the study. These research designs were considered appropriate because no variable was manipulated in this study. Descriptive survey research design has been successfully used by Adeyemi (2008), Okwori (2012), and Bello and Babawuro (2013).

Population of the Study

The study population was the six government technical colleges in Delta State and twenty eight (28) personnel which comprised of eight (8) personnel in woodwork department and twenty (20) principals (including vice principals) of government technical colleges in Delta State. Out of the twenty eight (28) respondents, 10 principals and 3 woodwork personnel's are from three (3) technical colleges in the rural areas while (10) principals and 5 woodwork personnel's are from three (3) technical colleges in the urban areas.

Table 1: Population of the Study

S/N	**Name of Institutions**	**No. of Principals**	**No. of Woodwork Personnel**	**Total**
1	Agbor Technical College (ATC)	3	Nil	**3**
2	Issele-uku Technical College (ITC)	3	3	**6**
3	Ofagbe Technical College (OTC)	3	Nil	**3**
4	Otor-Ogor Technical College (OTC)	4	2	**6**
5	Sapele Technical College (STC)	3	2	**5**
6	Utagba-ogbe Technical College (UTC)	4	1	**5**
Total		**20**	**8**	**28**

Sample and Sampling Technique

Census population was used in this study. Therefore, no sampling was done.

Instrument for Data Collection

NBTE checklist for required resources for teaching and learning woodwork and researcher's developed questionnaire titled "Adequacy of Woodwork Resources Questionnaire (AWRQ)" was used to collect data. The questionnaire was on a 3-point rating scale of Available as Required (AR), Available below Required (ABR), and Not Available (NA) with a corresponding weight of 3, 2, and 1 respectively. The questionnaire has five sections based on the research questions, Section A is on the availability and adequacy of human resources, B is on the availability and adequacy of infrastructural facilities, C is on the availability and adequacy of hand tools, D is on the availability and adequacy of power tools, and E is on the availability and adequacy of consumable materials. Section A, B, C, D, and E has 3, 10, 50, 14, and 8 items respectively. The National Board for Technical Education (NBTE) checklist for required resources for teaching and learning woodwork titled "Woodwork Resources Assessment Checklist (WRAC)" has nine (9) sections and ninety-two (92) items. Section A is on human resources, B on infrastructural facilities, C on library resources, D on utilities, E on hand tools, F on woodworking machines, G on power hand tools, H on other resources, and I on consumable materials.

Validity of Instrument

The face validity of the questionnaire (AWRQ) was done by the researcher's supervisor and two lecturers from the Department of Technical and Business Education, Delta State University, Abraka. The researcher gave three copies of the questionnaire together with the purpose of the study and research questions to the lecturers to validate the questionnaire. After validating the questionnaire, the lecturers suggested that three point rating scale should be used for the questionnaire. In addition, the NBTE woodwork resources checklist has been validated by NBTE.

Reliability of the Instrument

The reliability of the checklist has been established by NBTE. In addition, to ascertain the reliability of the questionnaire, ten copies of the questionnaire was administered to woodwork personnel and principals from government technical colleges in Edo State. Using Cronbach Alpha technique, reliability co-efficient of 0.66 was obtained which implies that the instrument is reliable.

Method of Data Collection

The researcher administered the questionnaire personally on the twenty eight woodwork personnel and principals. Also the researcher with the assistance of the Heads of Department of Woodwork in the six (6) technical colleges administered the checklist together through joint observation.

Method of Data Analysis

Frequency count was used to analysed research question 1,3,5,7, and 9. Furthermore, mean and standard deviation were used for research question 2,4,6,8, and 10 while t-test was used to test the hypotheses at 0.05 level of significance. Any mean response of 2.00 and above is regarded as 'Adequate' and mean response below 2.00 was regarded as 'Inadequate'. Furthermore, judging with the NBTE benchmark for woodwork resources, when the resource available is lower than the minimum resource required, such resource or item was regarded as inadequate and when it is equal or greater than the minimum resources required, the resources or item was regarded as adequate. Also, in testing the hypotheses, when t-calculated is less than t-critical, the hypothesis was accepted and when the t-calculated is greater than t-critical, the hypothesis was rejected.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DATA ANALYSIS

The results are presented according to research questions and hypotheses.

Research Question 1: What are the human resources available for the teaching and learning of woodwork in Delta State technical colleges?

Table 2: Distribution of Human Resources for the Teaching and Learning of Woodwork in Delta State Technical College.

DELTA STATE TECHNICAL COLLEGES			**AGBOR TECHNICAL COLLEGE**		**ISSELE-UKU TECHNICAL COLLEGE**		**OFAGBE TECHNICAL COLLEGE**		**OTO-OGOR TECHNICAL COLLEGE**		**SAPELE TECHNICAL COLLEGE**		**UTAGBE-OGBE TECHNICAL COLLEGE**	
Human Resources		**Minimum Number Required**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**
1.	Qualified Woodwork Teachers	2	-	NA	-	NA	-	NA	1	A	1	A	1	A

2.	Qualified Woodwork Technicians	3	-	NA	2	A	-	NA	1	A	1	A	-	NA
3.	Workshop Attendants	1	-	NA	1	A	-	NA	-	NA	-	NA	-	NA

***Note: NA= Not Available, A= Available**

Table 2 revealed that in the six technical colleges in Delta State, Agbor, Issele-uku, and Agbor technical colleges do not have qualified woodwork teachers while Otor-Ogor, Sapele, and Utagba-Ogbe technical colleges have qualified woodwork technicians. Furthermore, Agbor, Ofagbe, and Utagba-Ogbe technical colleges do not have qualified woodwork technicians while Issele-uku, Otor-Ogor, and Sapele technical college have woodwork technicians. In addition, only Issele-uku technical college has workshop attendant.

Research Question 2: Are the human resources available for the teaching and learning of woodwork in Delta State technical colleges adequate in relation to NBTE benchmark?

Table 3: Mean Response of Principals and Woodwork Personnel on the Adequacy of Human Resources Available for the Teaching and Learning of Woodwork in Delta State Technical Colleges

S/N	Item Statement	Response					
		Urban N=13			Rural N=15		
		Mean	SD	Remark	Mean	SD	Remark
	The following human resources are available and adequate in my school						
1.	Qualified Woodwork Teachers	1.76	0.43	Inadequate	1.40	0.50	Inadequate
2.	Qualified Woodwork Technicians	1.38	0.50	Inadequate	2.53	0.83	Adequate
3.	Workshop Attendants	1.00	0.00	Inadequate	1.80	1.01	Inadequate
Mean of Mean and SD		**1.38**	**0.38**		**1.91**	**0.57**	

Table 3 revealed that the human resources for the teaching and learning of woodwork in Delta State technical colleges are inadequate in both rural and urban technical colleges. Although in technical colleges in rural areas, they have qualified woodwork technicians.

Research Question 3: What are the infrastructural facilities available for the teaching and learning of woodwork in Delta State technical colleges?

Table 4: Distribution of Infrastructural Facilities for the Teaching and Learning of Woodwork in Delta State Technical College.

DELTA STATE TECHNICAL COLLEGES			**AGBOR TECHNICAL COLLEGE**		**ISSELE-UKU TECHNICAL COLLEGE**		**OFAGBE TECHNICAL COLLEGE**		**OTO-OGOR TECHNICAL COLLEGE**		**SAPELE TECHNICAL COLLEGE**		**UTAGBE-OGBE TECHNICAL COLLEGE**	
Infrastructural Facilities		**Minimum Number Required**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**
1.	Classroom blocks	3	-	NA	3	A	1	A	3	A	2	A	1	A

2.	Workshop	1	-	NA	1	A	1	A	-	NA	1	A	1	A
3.	Store	1	1	A	1	A	1	A	1	A	1	A	1	A
4.	Library	1	1	A	1	A	1	A	1	A	1	A	1	A
5.	Staff office	1	1	A	1	A	1	A	-	NA	1	A	1	A
6.	Toilet	2	1	A	-	NA	2	A	-	NA	1	A	-	NA
7.	Bore hole	1	1	A	-	NA	1	A	-	NA	1	A	1	A
8.	Extinguishers (including fire buckets)	4	-	NA	-	NA	-	NA	1	A	-	NA	-	NA
9.	Workbench (compta)	15	-	NA	5	A	4	A	2	A	10	A	4	A
10	First aid box	1	1	A	1	A	1	A	-	NA	-	NA	-	NA

***Note: NA= Not Available, A= Available**

Table 4 revealed that apart from Agbor technical college, the other technical colleges have classroom blocks. Also, Agbor and Otor-Ogor technical college do not have workshop. All the six technical colleges have store and library. Otor-Ogor technical college does not have staff office. Furthermore, Issele-uku, Otor-Ogor, and Utagba-Ogbe do not have toilet, as well, Issele-uku and Otor-Ogor technical college do not have borehole.

Research Question 4: Are the infrastructural facilities available for the teaching and learning of woodwork in Delta State technical colleges adequate in relation to NBTE benchmark?

Table 5: Mean Response of Principals and Woodwork Personnel on the Adequacy of Infrastructural Facilities Available for the Teaching and Learning of Woodwork in Delta State Technical Colleges

S/N	Item Statement	Response					
		Urban N=13			Rural N=15		
		Mean	SD	Remark	Mean	SD	Remark
	The following infrastructural facilities are available and adequate in my school :						
1.	Classroom blocks	1.76	0.43	Inadequate	2.60	0.50	Adequate
2.	Workshop	2.53	0.87	Adequate	2.20	1.01	Inadequate
3.	Store	3.00	0.00	Adequate	3.00	0.00	Adequate
4.	Library	3.00	0.00	Adequate	3.00	0.00	Adequate
5.	Staff office	3.00	0.00	Adequate	2.20	1.01	Adequate
6.	Toilet	1.61	0.50	Inadequate	1.40	0.82	Inadequate
7.	Bore hole	3.00	0.00	Adequate	1.40	0.82	Inadequate
8.	Extinguishers (including fire buckets)	1.00	0.00	Inadequate	1.80	1.01	Inadequate
9.	Workbench (compta)	1.76	0.43	Inadequate	2.00	0.00	Adequate
10	First aid box	1.46	0.87	Inadequate	2.20	1.01	Adequate
Grand Mean and SD		**2.21**	**0.77**		**2.18**	**0.56**	

Table 5 revealed that classroom blocks, toilet, fire extinguishers, workbench, and first aid box are inadequate in urban technical colleges while toilet, borehole, and extinguisher, are inadequate in rural technical colleges. Furthermore, workshop, store, library, staff office, and borehole are adequate in urban technical colleges, while classroom blocks, workshop, store, library, staff office, workbench, and first aid box are adequate in rural technical colleges.

Research Question 5: What are the hand tools available for the teaching and learning of woodwork in Delta State technical colleges?

Table 6: Distribution of Hand Tools for the Teaching and Learning of Woodwork in Delta State Technical Colleges.

DELTA STATE TECHNICAL COLLEGES			AGBOR TECHNICAL COLLEGE		ISSELE-UKU TECHNICAL COLLEGE		OFAGBE TECHNICAL COLLEGE		OTO-OGOR TECHNICAL COLLEGE		SAPELE TECHNICAL COLLEGE		UTAGBE-OGBE TECHNICAL COLLEGE	
Handtools		**Minimum Number Required**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**
1.	Paint brushes (various sizes)	10	-	NA	4	A	3	A	2	A	4	A	2	A
2.	Marking guage/mortise guage	20	-	NA	7	A	5	A	2	A	7	A	10	A

3.	Marking knives	10	-	NA	4	A	4	A	2	A	5	A	10	A
4.	Try square	20	-	NA	8	A	2	A	3	A	5	A	10	A
5.	Mitre square	10	-	NA	3	A	3	A	2	A	4	A	3	A
6.	Sliding bevel	10	-	NA	3	A	2	A	2	A	5	A	-	NA
7.	Measuring tape (metric)	10	-	NA	7	A	4	A	2	A	6	A	2	A
8.	Jack plane	20	-	NA	4	A	5	A	3	A	10	A	-	NA
9.	Smoothing plane	10	-	NA	4	A	4	A	2	A	5	A	10	A
10.	Rebate plane	5	-	NA	1	A	2	A	1	A	1	A	-	NA
11.	Multi plough plane	5	-	NA	1	A	2	A	1	A	2	A	-	NA
12.	Spoke shaves (straight/round)	10	-	NA	2	A	3	A	-	NA	3	A	1	A
13.	Rip saw	10	-	NA	3	A	3	A	2	A	5	A	2	A
14.	Crosscut/handsaw	10	-	NA	2	A	3	A	2	A	3	A	2	A
15.	Tenon saw	10	-	NA	2	A	3	A	2	A	2	A	5	A
16.	Panel saw	10	-	NA	2	A	4	A	2	A	2	A	5	A
17.	Coping saw	10	-	NA	2	A	4	A	-	NA	1	A	2	A
18.	Keyhole saw	5	-	NA	1	A	2	A	1	A	1	A	1	A
19.	Dovetail/bak	20	-	NA	1	A	2	A	2	A	3	A	1	A

	saw													
20.	Sets of firmer chisel	20	-	NA	5	A	5	A	3	A	10	A	10	A
21.	Sets of mortise chisel	10	-	NA	5	A	4	A	-	NA	5	A	10	A
22.	Sets of turning chisel	3	-	NA	1	A	1	A	-	NA	2	A	3	A
23.	Sets of twists bits	5	-	NA	1	A	2	A	1	A	2	A	1	A
24.	Counters ink	2	-	NA	1	A	1	A	-	NA	1	A	1	A
25.	Rose	2	-	NA	-	NA	1	A	-	NA	-	NA	-	NA
26.	Rachet braces	10	-	NA	1	A	3	A	2	A	10	A	2	A
27.	Breast drills	5	-	NA	1	A	2	A	1	A	5	A	-	NA
28.	Sets of drill bits	2	-	NA	1	A	1	A	-	NA	1	A	1	A
29.	Sets of screw drivers	5	-	NA	1	A	2	A	1	A	1	A	1	A
30.	Mallet	20	-	NA	5	A	5	A	5	A	5	A	2	A
31.	Craw hammer	10	-	NA	2	A	4	A	2	A	3	A	1	A
32.	Pein hammer	10	-	NA	2	A	3	A	2	A	2	A	1	A
33.	Warington hammer	10	-	NA	2	A	3	A	2	A	2	A	2	A
34.	Bradawl	10	-	NA	1	A	4	A	-	NA	3	A	2	A

35.	Pincers	10	-	NA	1	A	3	A	2	A	3	A	2	A
36.	F-cramp	5	-	NA	1	A	2	A	1	A	2	A	4	A
37.	Sash cramp	5	-	NA	1	A	2	A	1	A	2	A	3	A
38.	G-cramp	5	-	NA	2	A	3	A	1	A	2	A	1	A
39.	Bench-hold fast	5	-	NA	1	A	2	A	1	A	2	A	-	NA
40.	Sets of triangular files	5	-	NA	1	A	1	A	1	A	3	A	1	A
41.	Flat files	5	-	NA	1	A	2	A	2	A	2	A	-	NA
42.	Scraper (flat)	5	-		1	A	2	A	1	A	1	A	1	A
43.	Dividers	5	-		2	A	2	A	-	NA	2	A	1	A
44.	Sets of round files	5	-	NA	1	A	1	A	2	A	2	A	-	NA
45.	½ round files	5	-	NA	1	A	1	A	1	A	1	A	-	NA
46.	Scraper (cabinet)	5	-	NA	1	A	1	A	1	A	1	A	-	NA
47.	Calipers (set) inside and outside	5	-	NA	-	NA	1	A	1	A	1	A	-	NA
48.	Dowelling jig	2	-	NA	-	NA	1	A	-	NA	1	A	-	NA
49.	Rasps	5	-	NA	-	NA	2	A	1	A	1	A	4	NA

***Note: NA= Not Available, A= Available**

Table 6 revealed that apart from Agbor technical college, the other technical colleges have paint brushes, marking guage, marking knives, try square, mitre

square, measuring tape, smoothing plane, rip saw, crosscut/hand saw, keyhole saw, dovetail/ baksaw, sets of firmer chisel, sets of twist bits, rachet braces, sets of drill bits, set of screw drivers, mallet, craw hammer, pein hammer, warington hammer, G-cramp, set of triangular files, and scraper (flat). In addition, Agbor and Utagba-Ogbe technical college do not have sliding bevel, jack plane, rebate plane, multi plough plane, breast drills, bench-holdfast, flat files, set of round files, and scraper (cabinet) but the other technical colleges have these tools. Similarly, Agbor and Otor-Ogor technical colleges do not have spokes shaves, set of mortise chisel, and sets of drill bits, bradawl, and dividers which the other technical colleges have. However, Agbor, Issele-uku, and Utagba-Ogbe technical colleges do not have calipers and rasps which the other technical colleges have. Lastly, Agbor, Issele-uku, Otor-Ogor, and Utagba-Ogbe technical colleges do not have dowelling jig.

Research Question 6: Are the hand tools available for the teaching and learning of woodwork in Delta State technical colleges adequate in relation to NBTE benchmark?

Table 7: Mean Response of Principals and Woodwork Personnel on the Adequacy of Hand tools Available for the Teaching and Learning of Woodwork in Delta State Technical Colleges

S/N	Item Statement	Response					
		Urban N=13			Rural N=15		
		Mean	SD	Remark	Mean	SD	Remark
	The following hand tools are available and adequate in my school						
1.	Paint brushes (various sizes)	1.76	0.43	Inadequate	2.00	0.00	Adequate
2.	Marking guage/mortise guage	1.76	0.43	Inadequate	2.00	0.00	Adequate
3.	Marking knives	1.76	0.43	Inadequate	2.00	0.00	Adequate
4.	Try square	1.76	0.43	Inadequate	2.00	0.00	Adequate

5.	Mitre square	1.76	0.43	Inadequate	2.00	0.00	Adequate
6.	Sliding bevel	1.38	0.50	Inadequate	2.00	0.00	Adequate
7.	Measuring tape (metric)	1.76	0.43	Inadequate	2.00	0.00	Adequate
8.	Jack plane	1.38	0.50	Inadequate	2.00	0.00	Adequate
9.	Smoothing plane	1.76	0.43	Inadequate	2.00	0.00	Adequate
10.	Rebate plane	1.38	0.50	Inadequate	2.00	0.00	Adequate
11.	Multi plough plane	1.38	0.50	Inadequate	2.00	0.00	Adequate
12.	Spoke shaves (straight/round)	1.76	0.43	Inadequate	1.60	0.50	Inadequate
13.	Rip saw	1.76	0.43	Inadequate	2.00	0.00	Adequate
14.	Crosscut/handsaw	1.76	0.43	Inadequate	2.00	0.00	Adequate
15.	Tenon saw	1.76	043	Inadequate	2.00	0.00	Adequate
16.	Panel saw	1.76	0.43	Inadequate	2.00	0.00	Adequate
17.	Coping saw	1.76	0.43	Inadequate	1.60	0.50	Inadequate
18.	Keyhole saw	1.76	0.43	Inadequate	2.00	0.00	Adequate
19.	Dovetail/bak saw	1.76	0.43	Inadequate	2.00	0.00	Adequate
20.	Sets of firmer chisel	1.76	0.43	Inadequate	2.00	0.00	Adequate
21.	Sets of mortise chisel	1.76	0.43	Inadequate	1.60	0.50	Inadequate
22.	Sets of turning chisel	1.76	0.43	Inadequate	1.60	0.50	Inadequate
23.	Sets of twists bits	1.76	.0.43	Inadequate	2.00	0.00	Adequate
24.	Counters ink	1.76	0.43	Inadequate	1.60	0.50	Inadequate
25.	Rose	1.00	0.00	Inadequate	1.20	0.41	Inadequate
26.	Rachet braces	1.76	0.43	Inadequate	2.00	0.00	Adequate
27.	Breast drills	1.38	0.50	Inadequate	2.00	0.00	Adequate
28.	Sets of drill bits	1.76	0.43	Inadequate	1.60	0.50	Inadequate
29.	Sets of screw drivers	1.76	0.43	Inadequate	2.00	0.00	Adequate
30.	Mallet	1.76	0.43	Inadequate	2.00	0.00	Adequate
31.	Craw hammer	1.76	0.43	Inadequate	2.00	0.00	Adequate

32.	Pein hammer	1.76	0.43	Inadequate	2.00	0.00	Adequate
33.	Warington hammer	1.76	0.43	Inadequate	2.00	0.00	Adequate
34.	Bradawl	1.76	0.43	Inadequate	1.60	0.50	Inadequate
35.	Pincers	1.76	0.43	Inadequate	2.00	0.00	Adequate
36.	F-cramp	1.76	0.43	Inadequate	2.00	0.00	Adequate
37.	Sash cramp	1.76	0.43	Inadequate	2.00	0.00	Adequate
38.	G-cramp	1.76	0.43	Inadequate	2.00	0.00	Adequate
39.	Bench-hold fast	1.38	0.50	Inadequate	2.00	0.00	Adequate
40.	Sets of triangular files	1.76	0.43	Inadequate	2.00	0.00	Adequate
41.	Flat files	1.38	0.50	Inadequate	2.00	0.00	Adequate
42.	Scraper (flat)	1.76	0.43	Inadequate	2.00	0.00	Adequate
43.	Dividers	1.76	0.43	Inadequate	1.60	0.50	Inadequate
44.	Sets of round files	1.38	0.50	Inadequate	2.00	0.00	Adequate
45.	½ round files	1.38	0.50	Inadequate	2.00	0.00	Adequate
46.	Scraper (cabinet)	1.38	0.50	Inadequate	2.00	0.00	Adequate
47.	Calipers (set) inside and outside	1.38	0.50	Inadequate	1.60	0.50	Inadequate
48.	Dowelling jig	1.38	0.50	Inadequate	1.20	0.41	Inadequate
49.	Rasps	1.38	0.50	Inadequate	1.60	0.50	Inadequate
Grand Mean and SD		**1.64**	**0.19**		**1.88**	**0.21**	

Table 7 revealed that all the hand tools for teaching and learning woodwork are inadequate in urban while apart from item 12, 17,21,22,24,25,28,34,43,47,48,and 49 all the other items were adequate in rural technical colleges in Delta State.

Research Question 7: What are the power tools available for the teaching and learning of woodwork in Delta State technical colleges?

Table 8: Distribution of Power Tools for the Teaching and Learning of Woodwork in Delta State Technical Colleges.

DELTA STATE TECHNICAL COLLEGES			AGBOR TECHNICAL COLLEGE		ISSELE-UKU TECHNICAL COLLEGE		OFAGBE TECHNICAL COLLEGE		OTO-OGOR TECHNICAL COLLEGE		SAPELE TECHNICAL COLLEGE		UTAGBE-OGBE TECHNICAL COLLEGE	
Power tools		**Minimum Number Required**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**
1.	Circular saw bench	1	-	NA	2	A	1	A	-	NA	1	A	1	A
2.	Thicknesser (optional)	1	-	NA	1	A	1	A	-	NA	1	A	1	A
3.	Surface planner	1	-	NA	1	A	1	A	-	NA	1	A	1	A
4.	Wood-lathe	2	-	NA	3	A	1	A	1	A	2	A	4	A

5.	Band saw (optional)	1	-	NA	-	NA	1	A	-	NA	1	A	-	NA
6.	Compressor and spraying units	1	-	NA	-	NA	-	NA	-	NA	1	A	-	NA
7.	Circular saw	1	-	NA	1	A	1	A	-	NA	1	A	1	A
8.	Plan err tar	1	-	NA	1	A	1	A	-	NA	1	A	-	NA
9.	Orbital sander	1	-	NA	-	NA	1	A	-	NA	1	A	1	A
10.	Disc sander	1	-	NA	-	NA	1	A	-	NA	1	A	1	A
11.	Jig saw	1	-	NA	-	NA	1	A	1	A	1	A	-	NA
12.	Blower	1	-	NA	-	NA	1	A	1	A	1	A	-	NA
13.	Sprayer	1	-	NA	-	NA	-	NA	1	A	1	A	-	NA
14.	Drill	1	-	NA	1	A	1	A	1	A	1	A	-	NA

***Note: NA= Not Available, A= Available**

Table 8 revealed that Agbor and Otor-Ogor technical colleges do not have circular saw bench, thicknesser, surface planner, and circular saw which the other technical colleges have. Also, Agbor technical college does not have wood-lathe. Furthermore, Agbor, Issele-uku, Otor-Ogor, and Utagba-Ogbe do not have bandsaw. Only Sapele technical college has compressor and spraying units. More so, Agbor, Otor-Ogor, and Utagba-Ogbe do not have plan err tar. Similarly, Agbor, Issele-uku, and Otor-Ogor technical colleges do not have orbital sander. Ofagbe, Sapele, and Utagba-Ogbe technical colleges have disc sander. In addition, Ofagbe, Otor-Ogor, and Sapele technical colleges have jigsaw, and blower as well as Otor-Ogor and Sapele technical colleges which also have sprayer. Lastly, Agbor and Utagba-Ogbe technical colleges do not have drill.

Research Question 8: Are the power tools available for the teaching and learning of woodwork in Delta State technical colleges adequate in relation to NBTE benchmark?

Table 9: Mean Response of Principals and Woodwork Personnel on the Adequacy of Powertools Available for the Teaching and Learning of Woodwork in Delta State Technical Colleges

S/N	Item Statement	Response					
		Urban N=13			Rural N=15		
		Mean	SD	Remark	Mean	SD	Remark
	The following woodworking power tool are available and adequate in my school						
1.	Circular saw bench	2.53	0.87	Adequate	1.60	0.50	Inadequate
2.	Thicknesser (optional)	2.53	0.87	Adequate	1.60	0.50	Inadequate
3.	Surface planner	2.53	0.87	Adequate	1.60	0.50	Inadequate
4.	Wood-lathe	2.53	0.87	Adequate	3.00	0.00	Adequate
5.	Band saw (optional)	1.76	1.01	Inadequate	1.40	0.82	Inadequate
6.	Compressor and spraying units	1.76	1.01	Inadequate	1.00	0.00	Inadequate
7.	Circular saw	2.53	0.87	Adequate	2.20	1.01	Adequate
8.	Plan err tar	1.76	1.01	Adequate	2.20	1.01	Adequate
9.	Orbital sander	2.53	0.87	Adequate	1.80	1.01	Inadequate
10.	Disc sander	2.53	0.87	Adequate	1.40	0.82	Inadequate
11.	Jig saw	1.76	1.01	Inadequate	2.20	1.01	Adequate
12.	Blower	1.76	1.01	Inadequate	2.20	1.01	Adequate
13.	Sprayer	1.76	1.01	Inadequate	1.80	1.01	Inadequate
14.	Drill	1.76	1.01	Inadequate	3.00	0.00	Adequate
Grand Mean and SD		**2.14**	**0.39**		**1.92**	**0.57**	

Table 9 revealed that circular saw bench, thicknesser, surface planner, wood-lathe, circular saw, plan err tar, orbital sander, and disc scander are adequate in urban technical colleges, while wood lathe, circular saw, plan err tar, jig saw, blower, and drill were adequate in rural technical colleges in Delta State.

Research Question 9: What are the consumable materials available for teaching and learning woodwork in Delta State technical colleges?

Table 10: Distribution of Consumable Materials for Teaching and Learning of Woodwork in Delta State Technical College.

DELTA STATE TECHNICAL COLLEGES			**AGBOR TECHNICAL COLLEGE**		**ISSELE-UKU TECHNICAL COLLEGE**		**OFAGBE TECHNICAL COLLEGE**		**OTO-OGOR TECHNICAL COLLEGE**		**SAPELE TECHNICAL COLLEGE**		**UTAGBE-OGBE TECHNICAL COLLEGE**	
Consumable Materials		**Minimum Number Required**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**	**Number Available**	**Remark**
1.	Wood	**As**	-	NA	-	NA	-	NA	-	NA		A		A

2.	Nails of various sizes		-	NA	-	NA	-	NA	-	NA		A		A
3.	Wood glue		-	NA	-	NA	-	NA	-	NA		A	-	NA
4.	Plyboard		-	NA	-	NA	-	NA	-	NA		A		A
5.	Sand paper		-	NA	-	NA	-	NA	-	NA		A		A
6.	Tiner		-	NA	-	NA	-	NA	-	NA		A		A
7.	Paint		-	NA	-	NA	-	NA	-	NA		A		A
8.	Fittings		-	NA	-	NA	-	NA	-	NA		A		A

***Note: NA= Not Available, A= Available**

Table 10 revealed that Sapele and Utagba-Ogbe have wood, nails of various sizes, plyboard, sand paper, tiner, paint, and fittings. Also, only Sapele technical college has wood glue for the teaching and learning of woodwork.

Research Question 10: Are the consumable materials available for teaching and learning woodwork in Delta State technical colleges adequate in relation to NBTE benchmark?

Table 11: Mean Response of Principals and Woodwork Personnel on the Adequacy of Consumable Materials Available for the Teaching and Learning of Woodwork in Delta State Technical Colleges

S/N	Item Statement	Response					
		Urban N=13			Rural N=15		
		Mean	SD	Remark	Mean	SD	Remark
	The following consumable materials are available and adequate in my school						
1.	Wood	1.76	0.43	Inadequate	1.80	1.01	Inadequate
2.	Nails of various sizes	1.76	0.43	Inadequate	1.80	1.01	Inadequate

p3.	Wood glue	1.38	0.50	Inadequate	1.80	1.01	Inadequate
4.	Plyboard	1.76	0.43	Inadequate	1.80	1.01	Inadequate
5.	Sand paper	1.76	0.43	Inadequate	1.80	1.01	Inadequate
6.	Tiner	1.76	0.43	Inadequate	1.80	1.01	Inadequate
7.	Paint	1.76	0.43	Inadequate	1.80	1.01	Inadequate
8.	Fittings	1.76	0.43	Inadequate	1.80	1.01	Inadequate
Grand Mean and SD		**1.71**	**0.13**		**1.80**	**0.00**	

Table 11 revealed that the consumable materials for the teaching and learning of woodwork in rural and urban technical colleges in Delta State are inadequate.

Hypothesis 1: There is no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of human resources for the teaching and learning of woodwork in Delta State technical colleges.

Table 12: The t-test Analysis of Significant Difference Between the Mean Response of Principals and Woodwork Personnel from Rural and Urban Areas on the Adequacy of Human Resources for the Teaching and Learning of Woodwork in Delta State Technical Colleges.

Group	N	Mean	SD	df	t-cal.	t.crit.	Decision
Urban	13	1.38	0.38	26	-1.161	1.706	Accept
Rural	15	1.91	0.57				

Since the calculated t-value (-1.161) is less than the critical t-value (1.706) at 0.05 level of significance, (df=26) hypothesis 1 was accepted. This implies that there was no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of human resources for the teaching and learning of woodwork in Delta State technical colleges.

Hypothesis 2: There is no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of infrastructural facilities for the teaching and learning of woodwork in Delta State technical colleges.

Table 14: The t-test Analysis of Significant Difference Between the Mean Response of Principals and Woodwork Personnel from Rural And Urban Areas on the Adequacy of Infrastructural Facilities for the Teaching and Learning of Woodwork in Delta State Technical Colleges.

Group	N	Mean	SD	df	t-cal.	t.crit.	Decision
Urban	13	2.21	0.77	26	0.132	1.706	Accept
Rural	15	2.18	0.56				

Since the calculated t-value (0.132) is less than the critical t-value (1.706) at 0.05 level of significance, (df=26) hypothesis 2 was accepted. This implies that there was no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of infrastructural facilities for the teaching and learning of woodwork in Delta State technical colleges.

Hypothesis 3: There is no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of hand tools for the teaching and learning of woodwork in Delta State technical colleges.

Table 14: The t-test Analysis of Significant Difference Between the Mean Response of Principals and Woodwork Personnel from Rural and Urban Areas on the Adequacy of Hand Tools for the Teaching and Learning of Woodwork in Delta State Technical Colleges.

Group	N	Mean	SD	df	t-cal.	t.crit.	Decision
Urban	13	1.64	0.19	26	-6.891	1.706	Reject
Rural	15	1.88	0.21				

Since the calculated t-value (-6.891) is greater than the critical t-value (1.706) at 0.05 level of significance, (df=26) hypothesis 3 was rejected. This implies that there

was significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of hand tools for the teaching and learning of woodwork in Delta State technical colleges.

Hypothesis 4: There is no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of power tools for the teaching and learning of woodwork in Delta State technical colleges.

Table 15: The t-test Analysis of Significant Difference Between The Mean Response of Principals and Woodwork Personnel from Rural and Urban Areas on the Adequacy of Power Tools for the Teaching and Learning of Woodwork in Delta State Technical Colleges.

Group	N	Mean	SD	df	t-cal.	t.crit.	Decision
Urban	13	2.14	0.39	26	1.111	1.706	Accept
Rural	15	1.92	0.57				

Since the calculated t-value (1.111) is less than the critical t-value (1.706) at 0.05 level of significance, (df=26) hypothesis 4 was accepted. This implies that there was no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of power tools for the teaching and learning of woodwork in Delta State technical colleges.

Hypothesis 5: There is no significant difference in the mean response of and woodwork personnel from rural and urban areas on the adequacy of consumable materials for the teaching and learning of woodwork in Delta State technical colleges.

Table 16: The t-test Analysis of Significant Difference Between the Mean Response of Principals and Woodwork Personnel from Rural and Urban Areas on the Adequacy of Consumable Materials for the Teaching and Learning of Woodwork in Delta State Technical Colleges.

Group	N	Mean	SD	df	t-cal.	t.crit.	Decision
Urban	13	1.71	0.13	26	-1.842	1.706	Reject

Rural	15	1.80	0.00				

Since the calculated t-value (-1.842) is greater than the critical t-value (1.706) at 0.05 level of significance, (df=26) hypothesis 5 was rejected. This implies that there was significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of consumable materials for the teaching and learning of woodwork in Delta State technical colleges.

Findings

The findings of the study were presented based on research questions and hypotheses:

Based on the research questions, the study revealed that;

i. The available human resources for the teaching and learning of woodwork in Delta State technical colleges were inadequate (See Table 2 & 3).
ii. The available infrastructural facilities for the teaching and learning of woodwork in Delta State technical colleges were inadequate (See Table 4 & 5).
iii. The available hand tools for the teaching and learning of woodwork in Delta State technical colleges were inadequate (See Table 6 & 7).
iv. The available power tools for the teaching and learning of woodwork in Delta State technical colleges were inadequate (See Table 8 & 9).
v. The available consumable materials for the teaching and learning of woodwork in Delta State technical colleges were inadequate (See Table 10 & 11).

Based on the hypotheses, the study revealed that:

i. There was no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of human resources for the teaching and learning of woodwork in Delta State technical colleges (See Table 12).
ii. There was no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of infrastructural facilities for the teaching and learning of woodwork in Delta State technical colleges (See Table 13).

iii. There was significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of hand tools for the teaching and learning of woodwork in Delta State technical colleges (See Table 14).

iv. There was no significant difference in the mean response of principals and woodwork personnel from rural and urban areas on the adequacy of power tools for the teaching and learning of woodwork in Delta State technical colleges (See Table 15).

v. There was significant difference in the mean response of and woodwork personnel from rural and urban areas on the adequacy of consumable materials for the teaching and learning of woodwork in Delta State technical colleges (See Table 16).

Discussion of Findings

Table 3 and 4 revealed that the human resources for the teaching and learning of woodwork in Delta State technical colleges were inadequate. These findings are in line with the assertions of Okorie (2000), that qualified technical instructors are becoming scarce in training institutions (technical colleges inclusive). In support, Offorma (2005) quoting Nwagwu, those vocational technical subjects (woodwork inclusive) are not effectively implemented as most of the subjects are not offered due to lack of teachers. Furthermore, Anyanwu (2000), posited that the causes of poor implementation of technical education curriculum in Nigerian schools are due to many factors which include lack of specialist teachers. To buttress these findings, Ogushi (2008), reported that the problems faced by education administrators in the implementation of vocational education programmes in Nigeria include amongst other things, incompetent technology teachers.

Also, the findings of this study were in line with the survey report compiled by the National Education Research Development on the state of demand and supply of science and technology teachers nationwide, which indicated that about 320,000 representing 88% of the total needs were not available in 23 different subjects. In same vein, Agbente (1985) reported that shortage of qualified teachers is a worldwide phenomena but more obvious in developing countries where

educational system are constantly expanding without sufficiency of qualified teachers. Similarly, Udofort (1994) lamented that insufficient qualified science and technology teachers in schools have often resulted in the employment of unqualified teachers. More so, Edobor (2007) reported inadequacy of human resources in the teaching and learning of vocational courses. In addition, the findings of the study are in line with the researches of scholars such as Awurum (2005); Bverkerwa, Chavunduka, Absalom, and Chinyem (2011); Osam (2013); and Adeyemi (1997). These researchers all reported inadequacies of human resources in vocational training institutions. Contrary to the findings of this study, Akinfolarin, Ajayi, and Oloruntegbe (2012) and Okwori (2012), reported that most of the required resources in vocational technical education were available and adequate.

Table 5 and 6 revealed that infrastructural facilities such as classroom blocks, workshop, staff office, toilet, bore hole, and workbench were inadequate in Delta State technical colleges. These findings are in agreement with researches of scholars like Umunadi (2009); Olaniyonu (2006); Aina (2000); Puyate (2002); Nnoli (2001); Olumese (2004); Miller (2011); Yusuf(2006); Moja (2000); NERD (2004); Awurum (2005); Bvekerwa, et al. (2011); Osam (2013); Asiyai (2012); Ibrahim and Abdullahi (2010); Adeyemi (1997); and Bello and Babawuro (2013). These scholars reported in their various study inadequacies in infrastructural facilities in educational institutions (technical colleges inclusive). On a contrary, Akinfolarin, et al. (2012); and Okwori (2012) in their study reported that most of the required resources in vocational technical education were available and adequate.

Table 7 and 8 revealed that handtools for the teaching and learning of woodwork in Delta State technical colleges are inadequate. These findings are in line with the researches of scholars like Egwu (2009); Umunadi (2009); Okorie (2000); Olaniyonu (2006); Aina (2000); Puyate (2002); Olumese (2004); Musa (1993); Miller (2011); Uwaifo and Uwaifo (2009); Olaitan in Odu (2011); Moja (2000); Edobor (2007); Odunsanya (2006); NERD (2004); Awurum (2005); Bvekerwa, et al. (2011); Osam (2013); Okebukola (2012); Ibrahim and Abdullahi (2010); Bulama (2001); Adeyemi (1997); and Bello and Babawuro (2013). These researchers reported in their various studies inadequacies in instructional materials/ material resources such as handtools. On a contrary, the research works of Okwori

(2012); and Akinfolarin, et al. (2012), reported that there are adequate material resources for the teaching and learning of technical and vocational courses in educational institutions.

Table 9 and 10 revealed that woodwork powertools available for the teaching and learning of woodwork in Delta State technical colleges were inadequate. These findings are in line with Ekpeyong (2011); Egwu (2009); Umunadi (2009); Okorie (2000); Gwarzo (1999); Olaniyonu (2006); Aina (2000); Puyate (2002); Olumese (2004); NBTE (2011); Nwokomah (2005); Yusuf (2006); Audu and Aghogho (2006); Abdullahi (2003); Aina (2000); Musa (1993); Miller (2011); Odu (2011); Putsoa (2005); Fajemirokan (1999); Offorma (2005); Lilly and Efajemue (2011); Awurum (2005); Osam (2013); Ibrahim and Abdullahi (2010); Bulama (2001); Adeyemi (1997); and Bello and Babawuro (2013). These researchers reported inadequate material resources which include and not limited to powertools. In disagreement, Okwori (2012); and Akinfolarin et al. (2012), reported that material resources such as powertools were adequate in technical institutions.

Table 11 and 12 revealed that the consumable materials for the teaching and learning woodwork in Delta State technical colleges were inadequate. These findings are in agreement with other researches of scholars like Pam (2004); Aina (2000); Olumese (2004); Moja (2000); Nwokomah (2005); Aina (2000); Miller (2011); Uwaifo and Uwaifo (2009); Odu (2011); Olaitan in Odu (2011); Fajemirokan (1999); Okwori (2012); Moja (2000); Edobor (2007); Odunsanya (2006); NERD (2004); and Awurum (2005). These researchers indicated that material resources including consumable were inadequate for the teaching and learning of technical and vocational education courses. However, in disagreement, Akinfolarin et al. (2012), reported that material resources (consumable materials inclusive) were adequate in technical institutions.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary of Findings

The findings of this study were summarized as follows:

1. The human resources available for the teaching and learning of woodwork in Delta state technical colleges were inadequate using NBTE benchmark of woodwork resources as criteria for assessment.

2. Infrastructural facilities were inadequate in Delta State technical colleges were inadequate using NBTE benchmark of woodwork resources as criteria for assessment.

3. Hand tools available for the teaching and learning of woodwork were inadequate in Delta State technical colleges using NBTE benchmark of woodwork resources as criteria for assessment.

4. Power tools available for the teaching and learning of woodwork were inadequate in Delta State technical colleges using NBTE benchmark of woodwork resources as criteria for assessment.

5. The consumable materials available for the teaching and learning of woodwork were inadequate in Delta State technical colleges using NBTE benchmark of woodwork resources as criteria for assessment.

Conclusion

Based on the findings of this study, it was concluded that the human and material resources for the teaching and learning of woodwork in Delta State technical colleges were inadequate when it was assessed based on NBTE standard of expected resources for implementing woodwork programme at the technical college level. Conclusively, Delta State technical colleges are in dire need of human resources such as qualified and competent woodwork teachers, woodwork machinists, and workshop attendants. Also, the technical colleges are in need of material resources such as adequate classrooms, current textbooks, consumable

materials, handtools, powertools, and well equipped workshop with functional equipment.

Recommendations

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

1. Adequate human resources such as qualified woodwork teachers/instructors, woodwork technicians, and workshop attendants should be employed in Delta State technical colleges for effective implementation of woodwork curriculum.

2. Infrastructural facilities such as classroom blocks, workshops, staff offices, toilets, and bore hole should be adequately provided in Delta State technical colleges for the effective implementation of woodwork curriculum.

3. Woodwork hand tools such as saw, hammer, jack plane, and steel tape should be adequately provided in Delta State technical colleges for effective implementation of woodwork curriculum.

4. Woodwork power tools such as circular saw, surface planner, wood lathe, and band saw should be adequately provided in Delta State technical colleges for effective implementation of woodwork curriculum.

5. Woodwork consumable materials such as wood, nail, glue, and paint should be adequately provided in Delta State technical colleges for effective implementation of woodwork curriculum.

Suggestions for Further Studies

The following topics were suggested for further studies:

Same study should be conducted using larger sample. For example:

1. Assessment of Human and Material Resources for the Teaching and Learning of Woodwork in Government Technical Colleges in Southern Nigeria.

2. Assessment of Human and Material Resources for the Teaching and Learning of Woodwork in Government Technical Colleges in South-South Geopolitical Zone of Nigeria.

3. Assessment of Human and Material Resources for the Teaching and Learning of Woodwork in Government Technical Colleges in Niger-Delta Region of Nigeria.

4. Assessment of Human and Material Resources for the Teaching and Learning of Woodwork in Government Technical Colleges in Edo and Delta State of Nigeria.

Also, similar study should be carried out to assess the human and material resources for teaching and learning of other trade courses in government technical colleges in Nigeria. For example:

1. Assessment of Human and Material Resources for the Teaching and Learning of Metalwork in Government Technical Colleges in Southern Nigeria.

2. Assessment of Human and Material Resources for the Teaching and Learning of Auto-Vehicle Mechanic in Government Technical Colleges in South-South Geopolitical Zone of Nigeria.

3. Assessment of Human and Material Resources for the Teaching and Learning of Brick/Block-laying and Concreting in Government Technical Colleges in Niger-Delta Region of Nigeria.

4. Assessment of Human and Material Resources for the Teaching and Learning of Electrical/Electronics in Government Technical Colleges in Edo and Delta State of Nigeria.

Contribution to Knowledge

This research contributed to existing knowledge in the field of education with special reference to technical education in terms of the status of resources in Delta State technical colleges being the most recent to be conducted to assess

human and material resources for the teaching and learning of woodwork in Delta State technical colleges. It contributed to knowledge in the following ways:

1. The study established that the human resources available for teaching and learning of woodwork were inadequate in Delta State technical colleges.

2. The study justified that the level of adequacy of the human resources available for teaching and learning of woodwork was low in Delta State technical colleges.

3. The study established that the material resources available for teaching and learning of woodwork were inadequate in Delta State technical colleges.

4. The study justified that the level of adequacy of the material resources available for teaching and learning of woodwork was low in Delta State technical colleges.

Limitations of the Study

During the course of the study, the researcher encountered some hindrances as constraints which included, poor internet network which act as obstacle in searching for relevant literatures. More so, since the findings of this study provided good guides for conducting similar studies in other populations, the results are most applicable in Delta State, as such the findings cannot be generalize for the entire country.

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APPENDIX A

Woodwork Resource Assessment Checklist (WRAC) from NBTE

	Resources	**Minimum Number Required**	**Number Available**
A.	**Human Resources**		
1.	Qualified Woodwork Teachers	2	
2.	Qualified Woodwork Technicians	3	
3.	Workshop Attendants	1	
B.	**Infrastructural Facilities**		
4.	Classroom blocks	3	
5.	Workshop	1	
6.	Store	1	
7.	Library	1	
8.	Staff office	1	
9.	Toilet	2	
10.	Bore hole	1	
C.	**Library Resources**		
11.	Woodwork Textbooks	5	
12.	Teachers guide	2	
13.	Woodwork curriculum	2	
D.	**Utilities**		

14.	Extinguishers(including fire buckets)	4	
15.	Workbench (compta)	15	
16.	First aid box	1	
E.	**Handtools**		
17.	Paint brushes (various sizes)	10	
18.	Marking guage/mortise guage	20	
19.	Marking knives	10	
20.	Try square	20	
21.	Mitre square	10	
22.	Sliding bevel	10	
23.	Measuring tape (metric)	10	
24.	Jack plane	20	
25.	Smoothing plane	10	
26.	Rebate plane	5	
27.	Multi plough plane	5	
28.	Spoke shaves (straight/round)	10	
29.	Rip saw	10	
30.	Crosscut/handsaw	10	
31.	Tenon saw	10	
32.	Panel saw	10	
33.	Coping saw	10	

34.	Keyhole saw	5	
35.	Dovetail/bak saw	20	
36.	Sets of firmer chisel	20	
37.	Sets of mortise chisel	10	
38.	Sets of turning chisel	3	
39.	Sets of twists bits	5	
40.	Counters ink	2	
41.	Rose	2	
42.	Rachet braces	10	
43.	Breast drills	5	
44.	Sets of drill bits	2	
45.	Sets of screw drivers	5	
46.	Mallet	20	
47.	Craw hammer	10	
48.	Pein hammer	10	
49.	Warington hammer	10	
50.	Bradawl	10	
51.	Pincers	10	
52.	F-cramp	5	
53.	Sash cramp	5	
54.	G-cramp	5	
55.	Bench-hold fast	5	

56.	Sets of triangular files	5	
57.	Flat files	5	
58.	Scraper (flat)	5	
59.	Dividers	5	
60.	Sets of round files	5	
61.	½ round files	5	
62.	Scraper (cabinet)	5	
63.	Calipers (set) inside and outside	5	
64.	Dowelling jig	2	
65.	Rasps	5	
F.	**Woodworking Machines**		
66.	Circular saw bench	1	
67.	Thicknesser (optional)	1	
68.	Surface planner	1	
69.	Wood-lathe	2	
70.	Band saw (optional)	1	
71.	Compressor and spraying units	1	
G.	**Power hand tools**		
72.	Circular saw	1	
73.	Plan err tar	1	
74.	Orbital sander	1	
75.	Disc sander	1	

76.	Jig saw	1	
77.	Blower	1	
78.	Sprayer	1	
79.	Drill	1	
H.	**Others**		
80.	Electric plant	1	
81.	Dust bin	1	
82.	Spade	1	
83.	Thruck /van	1	
84.	Tool rack	1	
I.	**Consumable materials**		
85.	Wood	As available	
86.	Nails of various sizes	As available	
87.	Wood glue	As available	
88.	Plyboard	As available	
89.	Sand paper	As available	
90.	Tiner	As available	
91.	Paint	As available	
92.	Fittings	As available	

APPENDIX B

QUESTIONNAIRE

Dear Respondents,

I am a Post-graduate student of Delta State University conducting a research on "Assessment of Human and Material Resources for the Teaching and Learning of Woodwork Technology in Delta State Technical Colleges".

Kindly, respond to the questionnaire.

Instruction: Please tick (√) Available as Required (AR), Available below Required (ABR), Not Available (NA) according to the resources available in your schools.

S/N	**ITEM STATEMENT**	**RESPONSE**		
SECTION A.	**The following human resources are available and adequate in my school**	**AR**	**ABR**	**NA**
1.	Qualified Woodwork Teachers			
2.	Qualified Woodwork Technicians			
3.	Workshop Attendants			
B.	**The following infrastructural facilities are available and adequate in my school :**			
4.	Classroom blocks			
5.	Workshop			
6.	Store			
7.	Library			
8.	Staff office			
9.	Toilet			
10.	Bore hole			
11.	Extinguishers(including fire buckets)			
12.	Workbench (compta)			
13.	First aid box			
C.	**The following hand tools are available and adequate in my school**			

14.	Paint brushes (various sizes)			
15.	Marking guage/mortise guage			
16.	Marking knives			
17.	Try square			
18.	Mitre square			
19.	Sliding bevel			
20.	Measuring tape (metric)			
21.	Jack plane			
22.	Smoothing plane			
23.	Rebate plane			
24.	Multi plough plane			
25.	Spoke shaves (straight/round)			
26.	Rip saw			
27.	Crosscut/handsaw			
28.	Tenon saw			
29.	Panel saw			
30.	Coping saw			
31.	Keyhole saw			
32.	Dovetail/bak saw			
33.	Sets of firmer chisel			
34.	Sets of mortise chisel			
35.	Sets of turning chisel			
36.	Sets of twists bits			
37.	Counters ink			
38.	Rose			
39.	Rachet braces			
40.	Breast drills			
41.	Sets of drill bits			
42.	Sets of screw drivers			
43.	Mallet			
44.	Craw hammer			

45.	Pein hammer			
46.	Warington hammer			
47.	Bradawl			
48.	Pincers			
49.	F-cramp			
50.	Sash cramp			
51.	G-cramp			
52.	Bench-hold fast			
53.	Sets of triangular files			
54.	Flat files			
55.	Scraper (flat)			
56.	Dividers			
57.	Sets of round files			
58.	½ round files			
59.	Scraper (cabinet)			
60.	Calipers (set) inside and outside			
61.	Dowelling jig			
62.	Rasps			
D.	**The following woodworking power tool are available and adequate in my school**			
63.	Circular saw bench			
64.	Thicknesser (optional)			
65.	Surface planner			
66.	Wood-lathe			
67.	Band saw (optional)			
68.	Compressor and spraying units			
69.	Circular saw			
70.	Plan err tar			
71.	Orbital sander			
72.	Disc sander			
73.	Jig saw			
74.	Blower			

75.	Sprayer			
76.	Drill			
E.	**The following consumable materials are available and adequate in my school**			
77.	Wood			
78.	Nails of various sizes			
79.	Wood glue			
80.	Plyboard			
81.	Sand paper			
82.	Tiner			
83.	Paint			
84.	Fittings			

APPENDIX C

LETTER OF PERMISSION

Delta State University,

Abraka.

_____,2014.

The Principal,

_____ Technical College,

_____.

Through:

The H.O.D,

Department of Carpentry and Joinery,

_____Technical College,

_____.

Dear Sir,

LETTER OF PERMISSION TO ASSESS THE RESOURCES FOR THE TEACHING AND LEARNING OF WOODWORK

Sir, I am a master's student of Delta State University, Abraka carrying out a research on "Assessment of Human and Material Resources for the Teaching and Learning of Woodwork in Delta State Technical Colleges".

I write to request for your permission to assess the resources for the teaching and learning of woodwork in your school for the purpose of my research. Be rest assure that all information will be treated confidentially.

Thanks for your co-operation and understanding.

Yours faithfully,

Igberadja Serumu

APPENDIX D

LETTER OF INTRODUCTION

Delta State University,

Abraka.

_____,2014.

The Principal,

_____ Technical College,

_____.

Through:

The H.O.D,

Department of Carpentry and Joinery,

_____Technical College,

_____.

Dear Sir,

LETTER OF INTRODUCTION

The bearer **IGBERADJA SERUMU** is a postgraduate student of Delta State University, Abraka carrying out a research on "Assessment of Human and Material Resources for the Teaching and Learning of Woodwork in Delta State Technical Colleges" under my supervision.

The purpose of this letter is to introduce him to you. Kindly gives him the right information he needs for the purpose of his research. All information will be treated confidentially.

Thanks for your co-operation and understanding.

Yours faithfully,

Dr. Odu, K.O.

APPENDIX E

Reliability Statistics for Questionnaire

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.661	.668	2

APPENDIX F

SPSS OUTPUT

```
SAVE OUTFILE='C:\Users\Joe Ayonmike\Desktop\FACULTY DEFENCE SERUMU\Rural Data
Serumu Msc.sav'
  /COMPRESSED.
DESCRIPTIVES VARIABLES=VAR00001 VAR00002 VAR00003 VAR00004 VAR00005 VAR00006 V
AR00007 VAR00008 VAR00009 VAR00010 VAR00011 VAR00012 V
   AR00013 VAR00014 VAR00015 VAR00016 VAR00017 VAR00018 VAR00019 VAR00020 VAR0
0021 VAR00022 VAR00023 VAR00024 VAR00025
    VAR00026 VAR00027 VAR00028 VAR00029 VAR00030 VAR00031 VAR00032 VAR00033 VA
R00034 VAR00035 VAR00036 VAR00037 VAR00038 VAR00039 VA
   R00040 VAR00041 VAR00042 VAR00043 VAR00044 VAR00045 VAR00046 VAR00047 VAR00
048 VAR00049 VAR00050 VAR00051 VAR00052 VAR00053
    VAR00054 VAR00055 VAR00056 VAR00057 VAR00058 VAR00059 VAR00060 VAR00061 VA
R00062 VAR00063 VAR00064 VAR00065 VAR00066 VAR00067 VA
   R00068 VAR00069 VAR00070 VAR00071 VAR00072 VAR00073 VAR00074 VAR00075 VAR00
076 VAR00077 VAR00078 VAR00079 VAR00080 VAR00081
    VAR00082 VAR00083 VAR00084

  /STATISTICS=MEAN STDDEV.
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Descriptives

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[DataSet0] C:\Users\Joe Ayonmike\Desktop\FACULTY DEFENCE SERUMU\Rural Data Ser

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Descriptive Statistics

	N	Mean	Std. Deviation
VAR00001	15	1.4000	.50709
VAR00002	15	2.5333	.83381
VAR00003	15	1.8000	1.01419
VAR00004	15	2.6000	.50709
VAR00005	15	2.2000	1.01419
VAR00006	15	3.0000	.00000
VAR00007	15	3.0000	.00000
VAR00008	15	2.2000	1.01419
VAR00009	15	1.4000	.82808
VAR00010	15	1.4000	.82808
VAR00011	15	1.8000	1.01419
VAR00012	15	2.0000	.00000
VAR00013	15	2.2000	1.01419
VAR00014	15	2.0000	.00000
VAR00015	15	2.0000	.00000
VAR00016	15	2.0000	.00000

VAR00017	15	2.0000	.00000
VAR00018	15	2.0000	.00000
VAR00019	15	2.0000	.00000
VAR00020	15	2.0000	.00000
VAR00021	15	2.0000	.00000
VAR00022	15	2.0000	.00000
VAR00023	15	2.0000	.00000
VAR00024	15	2.0000	.00000
VAR00025	15	1.6000	.50709
VAR00026	15	2.0000	.00000
VAR00027	15	2.0000	.00000
VAR00028	15	2.0000	.00000
VAR00029	15	2.0000	.00000
VAR00030	15	1.6000	.50709
VAR00031	15	2.0000	.00000
VAR00032	15	2.0000	.00000
VAR00033	15	2.0000	.00000
VAR00034	15	1.6000	.50709
VAR00035	15	1.6000	.50709
VAR00036	15	2.0000	.00000
VAR00037	15	1.6000	.50709
VAR00038	15	1.2000	.41404
VAR00039	15	2.0000	.00000
VAR00040	15	2.0000	.00000
VAR00041	15	1.6000	.50709
VAR00042	15	2.0000	.00000
VAR00043	15	2.0000	.00000
VAR00044	15	2.0000	.00000
VAR00045	15	2.0000	.00000
VAR00046	15	2.0000	.00000
VAR00047	15	1.6000	.50709
VAR00048	15	2.0000	.00000
VAR00049	15	2.0000	.00000
VAR00050	15	2.0000	.00000
VAR00051	15	2.0000	.00000
VAR00052	15	2.0000	.00000
VAR00053	15	2.0000	.00000

VAR00054	15	2.0000	.00000
VAR00055	15	2.0000	.00000
VAR00056	15	1.6000	.50709
VAR00057	15	2.0000	.00000
VAR00058	15	2.0000	.00000
VAR00059	15	2.0000	.00000
VAR00060	15	1.6000	.50709
VAR00061	15	1.2000	.41404
VAR00062	15	1.6000	.50709
VAR00063	15	1.6000	.50709
VAR00064	15	1.6000	.50709
VAR00065	15	1.6000	.50709
VAR00066	15	3.0000	.00000
VAR00067	15	1.4000	.82808
VAR00068	15	1.0000	.00000
VAR00069	15	2.2000	1.01419
VAR00070	15	2.2000	1.01419
VAR00071	15	1.8000	1.01419
VAR00072	15	1.4000	.82808
VAR00073	15	2.2000	1.01419
VAR00074	15	2.2000	1.01419
VAR00075	15	1.8000	1.01419
VAR00076	15	3.0000	.00000
VAR00077	15	1.8000	1.01419
VAR00078	15	1.8000	1.01419
VAR00079	15	1.8000	1.01419
VAR00080	15	1.8000	1.01419
VAR00081	15	1.8000	1.01419
VAR00082	15	1.8000	1.01419
VAR00083	15	1.8000	1.01419
VAR00084	15	1.8000	1.01419
Valid N (listwise)	15		

```
SAVE OUTFILE='C:\Users\Joe Ayonmike\Desktop\FACULTY DEFENCE SERUMU\Urban Data
Serumu Msc.sav'
  /COMPRESSED.
DESCRIPTIVES VARIABLES=VAR00001 VAR00002 VAR00003 VAR00004 VAR00005 VAR00006 V
AR00007 VAR00008 VAR00009 VAR00010 VAR00011 VAR00012 V
   AR00013 VAR00014 VAR00015 VAR00016 VAR00017 VAR00018 VAR00019 VAR00020 VAR0
0021 VAR00022 VAR00023 VAR00024 VAR00025
```

```
    VAR00026 VAR00027 VAR00028 VAR00029 VAR00030 VAR00031 VAR00032 VAR00033 VA
R00034 VAR00035 VAR00036 VAR00037 VAR00038 VAR00039 VA
   R00040 VAR00041 VAR00042 VAR00043 VAR00044 VAR00045 VAR00046 VAR00047 VAR00
048 VAR00049 VAR00050 VAR00051 VAR00052 VAR00053
    VAR00054 VAR00055 VAR00056 VAR00057 VAR00058 VAR00059 VAR00060 VAR00061 VA
R00062 VAR00063 VAR00064 VAR00065 VAR00066 VAR00067 VA
   R00068 VAR00069 VAR00070 VAR00071 VAR00072 VAR00073 VAR00074 VAR00075 VAR00
076 VAR00077 VAR00078 VAR00079 VAR00080 VAR00081
    VAR00082 VAR00083 VAR00084

  /STATISTICS=MEAN STDDEV.
```

Descriptives

```
[DataSet0] C:\Users\Joe Ayonmike\Desktop\FACULTY DEFENCE SERUMU\Urban Data Ser

umu Msc.sav
```

Descriptive Statistics

	N	Mean	Std. Deviation
VAR00001	13	1.7692	.43853
VAR00002	13	1.3846	.50637
VAR00003	15	1.0000	.00000
VAR00004	13	1.7692	.43853
VAR00005	13	2.5385	.87706
VAR00006	13	3.0000	.00000
VAR00007	13	3.0000	.00000
VAR00008	13	3.0000	.00000
VAR00009	13	1.6154	.50637
VAR00010	13	3.0000	.00000
VAR00011	13	1.0000	.00000
VAR00012	13	1.7692	.43853
VAR00013	13	1.4615	.87706
VAR00014	13	1.7692	.43853
VAR00015	13	1.7692	.43853
VAR00016	13	1.7692	.43853
VAR00017	13	1.7692	.43853
VAR00018	13	1.7692	.43853
VAR00019	13	1.3846	.50637
VAR00020	13	1.7692	.43853
VAR00021	13	1.3846	.50637
VAR00022	13	1.7692	.43853
VAR00023	13	1.3846	.50637
VAR00024	13	1.3846	.50637
VAR00025	13	1.7692	.43853

VAR00026	13	1.7692	.43853
VAR00027	13	1.7692	.43853
VAR00028	13	1.7692	.43853
VAR00029	13	1.7692	.43853
VAR00030	13	1.7692	.43853
VAR00031	13	1.7692	.43853
VAR00032	13	1.7692	.43853
VAR00033	13	1.7692	.43853
VAR00034	13	1.7692	.43853
VAR00035	13	1.7692	.43853
VAR00036	13	1.7692	.43853
VAR00037	13	1.7692	.43853
VAR00038	13	1.0000	.00000
VAR00039	13	1.7692	.43853
VAR00040	13	1.3846	.50637
VAR00041	13	1.7692	.43853
VAR00042	13	1.7692	.43853
VAR00043	13	1.7692	.43853
VAR00044	13	1.7692	.43853
VAR00045	13	1.7692	.43853
VAR00046	13	1.7692	.43853
VAR00047	13	1.7692	.43853
VAR00048	13	1.7692	.43853
VAR00049	13	1.7692	.43853
VAR00050	13	1.7692	.43853
VAR00051	13	1.7692	.43853
VAR00052	13	1.3846	.50637
VAR00053	13	1.7692	.43853
VAR00054	13	1.3846	.50637
VAR00055	13	1.7692	.43853
VAR00056	13	1.7692	.43853
VAR00057	13	1.3846	.50637
VAR00058	13	1.3846	.50637
VAR00059	13	1.3846	.50637
VAR00060	13	1.3846	.50637
VAR00061	13	1.3846	.50637
VAR00062	13	1.3846	.50637

VAR00063	13	2.5385	.87706
VAR00064	13	2.5385	.87706
VAR00065	13	2.5385	.87706
VAR00066	13	2.5385	.87706
VAR00067	13	1.7692	1.01274
VAR00068	13	1.7692	1.01274
VAR00069	13	2.5385	.87706
VAR00070	13	1.7692	1.01274
VAR00071	13	2.5385	.87706
VAR00072	13	2.5385	.87706
VAR00073	13	1.7692	1.01274
VAR00074	13	1.7692	1.01274
VAR00075	13	1.7692	1.01274
VAR00076	13	1.7692	1.01274
VAR00077	13	1.7692	.43853
VAR00078	13	1.7692	.43853
VAR00079	13	1.3846	.50637
VAR00080	13	1.7692	.43853
VAR00081	13	1.7692	.43853
VAR00082	13	1.7692	.43853
VAR00083	13	1.7692	.43853
VAR00084	13	1.7692	.43853
Valid N (listwise)	13		

```
T-TEST PAIRS=UrbanH1 WITH RuralH1 (PAIRED)
  /CRITERIA=CI(.9500)

  /MISSING=ANALYSIS.
```

T-Test

```
[DataSet0]
```

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	UrbanH1	1.3800	3	.38000	.21939
	RuralH1	1.9100	3	.57297	.33081

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	UrbanH1 - RuralH1	-.53000	.79038	.45633	-2.49341	1.43341	-1.161	2	.365

```
T-TEST PAIRS=UrbanH2 WITH RuralH2 (PAIRED)
  /CRITERIA=CI(.9500)

  /MISSING=ANALYSIS.
```

T-Test

```
[DataSet0]
```

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	UrbanH2	2.2120	10	.77390	.24473
	RuralH2	2.1800	10	.56921	.18000

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	UrbanH2 - RuralH2	.03200	.76692	.24252	-.51662	.58062	.132	9	.898

```
T-TEST PAIRS=UrbanH3 WITH RuralH3 (PAIRED)
  /CRITERIA=CI(.9500)

  /MISSING=ANALYSIS.
```

T-Test

[DataSet0]

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	UrbanH3	1.6438	49	.19307	.02758
	RuralH3	1.8857	49	.21602	.03086

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	UrbanH3 - RuralH3	-.24195	.24576	.03511	-.31254	-.17136	-6.891	48	.000

```
T-TEST PAIRS=UrbanH4 WITH RuralH4 (PAIRED)
  /CRITERIA=CI(.9500)

  /MISSING=ANALYSIS.
```

T-Test

[DataSet0]

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	UrbanH4	2.1450	14	.39953	.10678
	RuralH4	1.9286	14	.57969	.15493

Paired Samples Test

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	UrbanH4 - RuralH4	.21643	.72884	.19479	-.20439	.63725	1.111	13	.287

```
T-TEST PAIRS=UrbanH5 WITH RuralH5 (PAIRED)
  /CRITERIA=CI(.9500)
```

```
  /MISSING=ANALYSIS.
```

T-Test

```
[DataSet0]
```

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	UrbanH5	1.7125	8	.13435	.04750
	RuralH5	1.8000	8	.00000	.00000

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	UrbanH5 - RuralH5	-.08750	.13435	.04750	-.19982	.02482	-1.842	7	.108

```
SAVE OUTFILE='C:\Users\Joe Ayonmike\Desktop\FACULTY DEFENCE SERUMU\Data Hypoth
eses Serumu Msc.sav'

  /COMPRESSED.
```

APPENDIX G

COMPLETED CHECKLIST FROM DELTA STATE TECHNICAL COLLEGES

PRINCIPAL
AGBOR TECHNICAL COLLEGE
PMB 2075
AGBOR, DELTA STATE

Name of Institution: AGBOR TECHNICAL 10/10/14

Number of Staffs in Woodwork Department: —

Number of Principals (Including Vice Principals): ~~OWABOR~~ JE 3

Name of Principal: OWABOR

Signature/Date 10/10/14

Instructions: Kindly provide the following information in terms of quantity in the space provided.

Woodwork Resource Evaluation Checklist (WREC) from NBTE

	Resources	Minimum Number Required	Number Available
A.	**Human Resources**		
1.	Qualified Woodwork Teachers	2	
2.	Qualified Woodwork Technicians	3	
3.	Workshop Attendants	1	
B.	**Infrastructural Facilities**		
4.	Classroom blocks	3	
5.	Workshop	1	
6.	Store	1	
7.	Library	1	1
8.	Staff office	1	1

9.	Toilet	2	1
10.	Bore hole	1	1
C.	**Library Resources**		
11.	Woodwork Textbooks	5	
12.	Teachers guide	2	
13.	Woodwork curriculum	2	
D.	**Utilities**		NIL
14.	Extinguishers(including fire buckets)	4	NIL
15.	Workbench (compta)	15	
16.	First aid box	1	1
E.	**Handtools**		
17.	Paint brushes (various sizes)	10	
18.	Marking guage/mortise guage	20	
19.	Marking knives	10	
20.	Try square	20	
21.	Mitre square	10	NIL
22.	Sliding bevel	10	
23.	Measuring tape (metric)	10	1
24.	Jack plane	20	

25.	Smoothing plane	10	
26.	Rebate plane	5	
27.	Multi plough plane	5	
28.	Spoke shaves (straight/round)	10	
29.	Rip saw	10	
30.	Crosscut/handsaw	10	
31.	Tenon saw	10	
32.	Panel saw	10	
33.	Coping saw	10	
34.	Keyhole saw	5	
35.	Dovetail/bak saw	20	
36.	Sets of firmer chisel	20	
37.	Sets of mortise chisel	10	
38.	Sets of turning chisel	3	
39.	Sets of twists bits	5	
40.	Counters ink	2	
41.	Rose	2	
42.	Rachet braces	10	
43.	Breast drills	5	
44.	Sets of drill bits	2	

45.	Sets of screw drivers	5	
46.	Mallet	20	
47.	Craw hammer	10	
48.	Pein hammer	10	
49.	Warington hammer	10	
50.	Bradawl	10	
51.	Pincers	10	
52.	F-cramp	5	
53.	Sash cramp	5	
54.	G-cramp	5	
55.	Bench-hold fast	5	
56.	Sets of triangular files	5	
57.	Flat files	5	
58.	Scraper (flat)	5	
59.	Dividers	5	
60.	Sets of round files	5	
61.	½ round files	5	
62.	Scraper (cabinet)	5	
63.	Calipers (set) inside and outside	5	
64.	Dowelling jig	2	

65.	Rasps	5	
F.	**Woodworking Machines**		
66.	Circular saw bench	1	
67.	Thicknesser (optional)	1	
68.	Surface planner	1	
69.	Wood-lathe	2	
70.	Band saw (optional)	1	
71.	Compressor and spraying units	1	
G.	**Power hand tools**		
72.	Circular saw	1	
73.	Plan err tar	1	
74.	Orbital sander	1	
75.	Disc sander	1	
76.	Jig saw	1	
77.	Blower	1	
78.	Sprayer	1	
79.	Drill	1	
H.	**Others**		
80.	Electric plant	1	
81.	Dust bin	1	

82.	Spade	1	
83.	Thruck /van	1	
84.	Tool rack	1	
I.	**Consumable materials**		
85.	Wood	As available	
86.	Nails of various sizes	As available	
87.	Wood glue	As available	
88.	Plyboard	As available	
89.	Sand paper	As available	
90.	Tiner	As available	
91.	Paint	As available	
92.	Fittings	As available	

Name of Institution: ISSELE-UKU TECHNICAL COLLEGE, ISSELE-UKU

Number of Staffs in Woodwork Department: NIL

Number of Principals (Including Vice Principals) 3

Name of Principal: MR ONUOHA R-O

Signature/Date 10/10/2024

Instructions: Kindly provide the following information in terms of quantity in the space provided.

Woodwork Resource Evaluation Checklist (WREC) from NBTE

	Resources	Minimum Number Required	Number Available
A.	**Human Resources**		
1.	Qualified Woodwork Teachers	2	—
2.	Qualified Woodwork Technicians	3	2
3.	Workshop Attendants	1	1
B.	**Infrastructural Facilities**		
4.	Classroom blocks	3	3
5.	Workshop	1	1
6.	Store	1	1
7.	Library	1	1
8.	Staff office	1	1

9.	Toilet	2	—
10.	Bore hole	1	—
C.	**Library Resources**		
11.	Woodwork Textbooks	5	—
12.	Teachers guide	2	—
13.	Woodwork curriculum	2	1
D.	**Utilities**		
14.	Extinguishers(including fire buckets)	4	—
15.	Workbench (compta)	15	5
16.	First aid box	1	1
E.	**Handtools**		
17.	Paint brushes (various sizes)	10	4
18.	Marking guage/mortise guage	20	7
19.	Marking knives	10	4
20.	Try square	20	8
21.	Mitre square	10	3
22.	Sliding bevel	10	3
23.	Measuring tape (metric)	10	7
24.	Jack plane	20	4

25.	Smoothing plane	10	4
26.	Rebate plane	5	1
27.	Multi plough plane	5	1
28.	Spoke shaves (straight/round)	10	2
29.	Rip saw	10	3
30.	Crosscut/handsaw	10	2
31.	Tenon saw	10	2
32.	Panel saw	10	2
33.	Coping saw	10	2
34.	Keyhole saw	5	1
35.	Dovetail/bak saw	20	1
36.	Sets of firmer chisel	20	5
37.	Sets of mortise chisel	10	5
38.	Sets of turning chisel	3	1
39.	Sets of twists bits	5	1
40.	Counters ink	2	1
41.	Rose	2	—
42.	Rachet braces	10	1
43.	Breast drills	5	1
44.	Sets of drill bits	2	1

45.	Sets of screw drivers	5	1
46.	Mallet	20	5
47.	Craw hammer	10	2
48.	Pein hammer	10	2
49.	Warington hammer	10	2
50.	Bradawl	10	1
51.	Pincers	10	1
52.	F-cramp	5	1
53.	Sash cramp	5	1
54.	G-cramp	5	2
55.	Bench-hold fast	5	1
56.	Sets of triangular files	5	1
57.	Flat files	5	1
58.	Scraper (flat)	5	1
59.	Dividers	5	2
60.	Sets of round files	5	1
61.	½ round files	5	1
62.	Scraper (cabinet)	5	1
63.	Calipers (set) inside and outside	5	—
64.	Dowelling jig	2	—

65.	Rasps	5	—
F.	**Woodworking Machines**		
66.	Circular saw bench	1	2
67.	Thicknesser (optional)	1	1
68.	Surface planner	1	1
69.	Wood-lathe	2	3
70.	Band saw (optional)	1	—
71.	Compressor and spraying units	1	—
G.	**Power hand tools**		
72.	Circular saw	1	1
73.	Plan err tar	1	1
74.	Orbital sander	1	—
75.	Disc sander	1	—
76.	Jig saw	1	—
77.	Blower	1	—
78.	Sprayer	1	—
79.	Drill	1	1
H.	**Others**		
80.	Electric plant	1	—
81.	Dust bin	1	1

82.	Spade	1	1
83.	Thruck /van	1	—
84.	Tool rack	1	1
I.	**Consumable materials**		
85.	Wood	As available	Not Available
86.	Nails of various sizes	As available	✓
87.	Wood glue	As available	✓
88.	Plyboard	As available	✓
89.	Sand paper	As available	✓
90.	Tiner	As available	✓
91.	Paint	As available	✓
92.	Fittings	As available	✓

Name of Institution: Ofagbe Technical College

Number of Staffs in Woodwork Department: NIL

Number of Principals (Including Vice Principals) 3

Name of Principal: OKORO M

Signature/Date 19/11/2014

OFAGBE TECHNICAL COLLEGE OFAGBE

Principal

Instructions: Kindly provide the following information in terms of quantity in the space provided.

Woodwork Resource Evaluation Checklist (WREC) from NBTE

	Resources	Minimum Number Required	Number Available
A.	**Human Resources**		
1.	Qualified Woodwork Teachers	2	—
2.	Qualified Woodwork Technicians	3	—
3.	Workshop Attendants	1	—
B.	**Infrastructural Facilities**		
4.	Classroom blocks	3	1
5.	Workshop	1	1
6.	Store	1	1
7.	Library	1	1
8.	Staff office	1	1

9.	Toilet	2	2
10.	Bore hole	1	1
C.	**Library Resources**		
11.	Woodwork Textbooks	5	4
12.	Teachers guide	2	1
13.	Woodwork curriculum	2	1
D.	**Utilities**		
14.	Extinguishers(including fire buckets)	4	—
15.	Workbench (compta)	15	4
16.	First aid box	1	1
E.	**Handtools**		
17.	Paint brushes (various sizes)	10	3
18.	Marking guage/mortise guage	20	5
19.	Marking knives	10	4
20.	Try square	20	2
21.	Mitre square	10	3
22.	Sliding bevel	10	2
23.	Measuring tape (metric)	10	4
24.	Jack plane	20	5

25.	Smoothing plane	10	4
26.	Rebate plane	5	2
27.	Multi plough plane	5	2
28.	Spoke shaves (straight/round)	10	3
29.	Rip saw	10	3
30.	Crosscut/handsaw	10	3
31.	Tenon saw	10	3
32.	Panel saw	10	4
33.	Coping saw	10	4
34.	Keyhole saw	5	2
35.	Dovetail/bak saw	20	2
36.	Sets of firmer chisel	20	5
37.	Sets of mortise chisel	10	4
38.	Sets of turning chisel	3	1
39.	Sets of twists bits	5	2
40.	Counters ink	2	1
41.	Rose	2	1
42.	Rachet braces	10	3
43.	Breast drills	5	2
44.	Sets of drill bits	2	1

45.	Sets of screw drivers	5	2
46.	Mallet	20	5
47.	Craw hammer	10	4
48.	Pein hammer	10	3
49.	Warington hammer	10	3
50.	Bradawl	10	4
51.	Pincers	10	3
52.	F-cramp	5	2
53.	Sash cramp	5	2
54.	G-cramp	5	3
55.	Bench-hold fast	5	2
56.	Sets of triangular files	5	1
57.	Flat files	5	2
58.	Scraper (flat)	5	2
59.	Dividers	5	2
60.	Sets of round files	5	1
61.	½ round files	5	1
62.	Scraper (cabinet)	5	1
63.	Calipers (set) inside and outside	5	1
64.	Dowelling jig	2	1

65.	Rasps	5	2
F.	**Woodworking Machines**		
66.	Circular saw bench	1	1
67.	Thicknesser (optional)	1	1
68.	Surface planner	1	1
69.	Wood-lathe	2	1
70.	Band saw (optional)	1	1
71.	Compressor and spraying units	1	—
G.	**Power hand tools**		
72.	Circular saw	1	1
73.	Plan err tar	1	1
74.	Orbital sander	1	1
75.	Disc sander	1	1
76.	Jig saw	1	1
77.	Blower	1	1
78.	Sprayer	1	—
79.	Drill	1	1
H.	**Others**		
80.	Electric plant	1	1
81.	Dust bin	1	1

82.	Spade	1	1
83.	Thruck /van	1	—
84.	Tool rack	1	1
I.	**Consumable materials**		
85.	Wood	As available	Not Available
86.	Nails of various sizes	As available	✓
87.	Wood glue	As available	✓
88.	Plyboard	As available	✓
89.	Sand paper	As available	✓
90.	Tiner	As available	✓
91.	Paint	As available	✓
92.	Fittings	As available	✓

Name of Institution: OGOR TECH. COLLEGE, OTOGOR

Number of Staffs in Woodwork Department: Two (2)

Number of Principals (Including Vice Principals) FOUR (4)

Name of Principal: Dr. Brinemugha. E.

Signature/Date 9/10/2014

VICE PRINCIPAL (ACADEMIC) IGOR TECH. COLLEGE OTOGOR

Instructions: Kindly provide the following information in terms of quantity in the space provided.

Woodwork Resource Evaluation Checklist (WREC) from NBTE

	Resources	Minimum Number Required	Number Available
A.	**Human Resources**	3	2
1.	Qualified Woodwork Teachers	2	1
2.	Qualified Woodwork Technicians	3	1
3.	Workshop Attendants	1	—
B.	**Infrastructural Facilities**		
4.	Classroom blocks	3	3
5.	Workshop	1	—
6.	Store	1	1
7.	Library	1	1
8.	Staff office	1	—

9.	Toilet	2	—
10.	Bore hole	1	—
C.	**Library Resources**		
11.	Woodwork Textbooks	5	2
12.	Teachers guide	2	1
13.	Woodwork curriculum	2	1
D.	**Utilities**		
14.	Extinguishers(including fire buckets)	4	1
15.	Workbench (compta)	15	2
16.	First aid box	1	—
E.	**Handtools**		
17.	Paint brushes (various sizes)	10	2
18.	Marking guage/mortise guage	20	2
19.	Marking knives	10	2
20.	Try square	20	3
21.	Mitre square	10	2
22.	Sliding bevel	10	2
23.	Measuring tape (metric)	10	2
24.	Jack plane	20	3

25.	Smoothing plane	10	2
26.	Rebate plane	5	1
27.	Multi plough plane	5	1
28.	Spoke shaves (straight/round)	10	—
29.	Rip saw	10	2
30.	Crosscut/handsaw	10	2
31.	Tenon saw	10	2
32.	Panel saw	10	2
33.	Coping saw	10	—
34.	Keyhole saw	5	1
35.	Dovetail/bak saw	20	2
36.	Sets of firmer chisel	20	3
37.	Sets of mortise chisel	10	—
38.	Sets of turning chisel	3	—
39.	Sets of twists bits	5	1
40.	Counters ink	2	—
41.	Rose	2	—
42.	Rachet braces	10	2
43.	Breast drills	5	1
44.	Sets of drill bits	2	—

45.	Sets of screw drivers	5	1
46.	Mallet	20	5
47.	Craw hammer	10	2
48.	Pein hammer	10	2
49.	Warington hammer	10	2
50.	Bradawl	10	—
51.	Pincers	10	2
52.	F-cramp	5	1
53.	Sash cramp	5	1
54.	G-cramp	5	1
55.	Bench-hold fast	5	1
56.	Sets of triangular files	5	1
57.	Flat files	5	2
58.	Scraper (flat)	5	1
59.	Dividers	5	—
60.	Sets of round files	5	2
61.	½ round files	5	1
62.	Scraper (cabinet)	5	1
63.	Calipers (set) inside and outside	5	1
64.	Dowelling jig	2	—

65.	Rasps	5	1
F.	**Woodworking Machines**		
66.	Circular saw bench	1	—
67.	Thicknesser (optional)	1	—
68.	Surface planner	1	—
69.	Wood-lathe	2	1
70.	Band saw (optional)	1	—
71.	Compressor and spraying units	1	—
G.	**Power hand tools**		
72.	Circular saw	1	—
73.	Plan err tar	1	—
74.	Orbital sander	1	—
75.	Disc sander	1	—
76.	Jig saw	1	1
77.	Blower	1	1
78.	Sprayer	1	1
79.	Drill	1	1
H.	**Others**		
80.	Electric plant	1	—
81.	Dust bin	1	1

82.	Spade	1	1
83.	Thruck /van	1	—
84.	Tool rack	1	1
I.	**Consumable materials**		
85.	Wood	As available	Available
86.	Nails of various sizes	As available	✓
87.	Wood glue	As available	✓
88.	Plyboard	As available	✓
89.	Sand paper	As available	✓
90.	Tiner	As available	✓
91.	Paint	As available	✓
92.	Fittings	As available	✓

Name of Institution: Sapele Technical College, Sapele

Number of Staffs in Woodwork Department: two

Number of Principals (Including Vice Principals) three

Name of Principal: Jude Oyaide

Signature/Date Oyaide 17/11/14

Instructions: Kindly provide the following information in terms of quantity in the space provided.

FED. TECHNICAL COL. PRINCIPAL SAPELE

Woodwork Resource Evaluation Checklist (WREC) from NBTE

	Resources	Minimum Number Required	Number Available
A.	**Human Resources**		
1.	Qualified Woodwork Teachers	2	1
2.	Qualified Woodwork Technicians	3	1
3.	Workshop Attendants	1	—
B.	**Infrastructural Facilities**		
4.	Classroom blocks	3	2
5.	Workshop	1	1
6.	Store	1	1
7.	Library	1	1
8.	Staff office	1	1

9.	Toilet	2	1
10.	Bore hole	1	1
C.	**Library Resources**		
11.	Woodwork Textbooks	5	10
12.	Teachers guide	2	2
13.	Woodwork curriculum	2	2
D.	**Utilities**		
14.	Extinguishers(including fire buckets)	4	—
15.	Workbench (compta)	15	10
16.	First aid box	1	—
E.	**Handtools**		
17.	Paint brushes (various sizes)	10	4
18.	Marking guage/mortise guage	20	7
19.	Marking knives	10	5
20.	Try square	20	5
21.	Mitre square	10	4
22.	Sliding bevel	10	5
23.	Measuring tape (metric)	10	6
24.	Jack plane	20	10

25.	Smoothing plane	10	5
26.	Rebate plane	5	1
27.	Multi plough plane	5	2
28.	Spoke shaves (straight/round)	10	3
29.	Rip saw	10	5
30.	Crosscut/handsaw	10	3
31.	Tenon saw	10	2
32.	Panel saw	10	2
33.	Coping saw	10	1
34.	Keyhole saw	5	1
35.	Dovetail/bak saw	20	3
36.	Sets of firmer chisel	20	10
37.	Sets of mortise chisel	10	5
38.	Sets of turning chisel	3	2
39.	Sets of twists bits	5	2
40.	Counters ink	2	1
41.	Rose	2	—
42.	Rachet braces	10	10
43.	Breast drills	5	5
44.	Sets of drill bits	2	1

45.	Sets of screw drivers	5	1
46.	Mallet	20	5
47.	Craw hammer	10	3
48.	Pein hammer	10	2
49.	Warington hammer	10	2
50.	Bradawl	10	3
51.	Pincers	10	3
52.	F-cramp	5	2
53.	Sash cramp	5	2
54.	G-cramp	5	2
55.	Bench-hold fast	5	2
56.	Sets of triangular files	5	3
57.	Flat files	5	2
58.	Scraper (flat)	5	1
59.	Dividers	5	2
60.	Sets of round files	5	2
61.	½ round files	5	1
62.	Scraper (cabinet)	5	1
63.	Calipers (set) inside and outside	5	1
64.	Dowelling jig	2	1

65.	Rasps	5	1
F.	**Woodworking Machines**		
66.	Circular saw bench	1	1
67.	Thicknesser (optional)	1	1
68.	Surface planner	1	1
69.	Wood-lathe	2	2
70.	Band saw (optional)	1	1
71.	Compressor and spraying units	1	1
G.	**Power hand tools**		
72.	Circular saw	1	1
73.	Plan err tar	1	1
74.	Orbital sander	1	1
75.	Disc sander	1	1
76.	Jig saw	1	1
77.	Blower	1	1
78.	Sprayer	1	1
79.	Drill	1	1
H.	**Others**		
80.	Electric plant	1	1
81.	Dust bin	1	1

82.	Spade	1	1
83.	Thruck /van	1	—
84.	Tool rack	1	1
I.	**Consumable materials**		
85.	Wood	As available	Available
86.	Nails of various sizes	As available	Available
87.	Wood glue	As available	✓
88.	Plyboard	As available	✓
89.	Sand paper	As available	✓
90.	Tiner	As available	✓
91.	Paint	As available	✓
92.	Fittings	As available	✓

Name of Institution: U/T/C, KWALE

Number of Staffs in Woodwork Department:.....

Number of Principals (Including Vice Principals).....4.....

Name of Principal: ENEBELI J. I. (JP)

Signature/Date.....

V.P. (ADMIN)
TAGBA-OGRE TECH. COLL.
STAGBA-OGRE
DELTA STATE

Instructions: Kindly provide the following information in terms of quantity in the space provided.

Woodwork Resource Evaluation Checklist (WREC) from NBTE

	Resources	Minimum Number Required	Number Available
A.	**Human Resources**		
1.	Qualified Woodwork Teachers	2	1
2.	Qualified Woodwork Technicians	3	—
3.	Workshop Attendants	1	—
B.	**Infrastructural Facilities**		
4.	Classroom blocks	3	1
5.	Workshop	1	1
6.	Store	1	1
7.	Library	1	1
8.	Staff office	1	1

9.	Toilet	2	NIL
10.	Bore hole	1	1
C.	**Library Resources**		
11.	Woodwork Textbooks	5	NIL
12.	Teachers guide	2	NIL
13.	Woodwork curriculum	2	2
D.	**Utilities**		
14.	Extinguishers(including fire buckets)	4	NIL
15.	Workbench (compta)	15	4
16.	First aid box	1	NIL
E.	**Handtools**		
17.	Paint brushes (various sizes)	10	2
18.	Marking guage/mortise guage	20	10
19.	Marking knives	10	10
20.	Try square	20	10
21.	Mitre square	10	3
22.	Sliding bevel	10	NIL
23.	Measuring tape (metric)	10	2
24.	Jack plane	20	NIL

25.	Smoothing plane	10	10
26.	Rebate plane	5	NIL
27.	Multi plough plane	5	NIL
28.	Spoke shaves (straight/round)	10	1
29.	Rip saw	10	2
30.	Crosscut/handsaw	10	2
31.	Tenon saw	10	5
32.	Panel saw	10	5
33.	Coping saw	10	2
34.	Keyhole saw	5	1
35.	Dovetail/bak saw	20	1
36.	Sets of firmer chisel	20	10
37.	Sets of mortise chisel	10	10
38.	Sets of turning chisel	3	3
39.	Sets of twists bits	5	1
40.	Counters ink	2	1
41.	Rose	2	NIL
42.	Rachet braces	10	2
43.	Breast drills	5	NIL
44.	Sets of drill bits	2	1

45.	Sets of screw drivers	5	1
46.	Mallet	20	2
47.	Craw hammer	10	1
48.	Pein hammer	10	1
49.	Warington hammer	10	2
50.	Bradawl	10	2
51.	Pincers	10	2
52.	F-cramp	5	4
53.	Sash cramp	5	3
54.	G-cramp	5	1
55.	Bench-hold fast	5	NIL
56.	Sets of triangular files	5	1
57.	Flat files	5	NIL
58.	Scraper (flat)	5	1
59.	Dividers	5	1
60.	Sets of round files	5	NIL
61.	½ round files	5	NIL
62.	Scraper (cabinet)	5	NIL
63.	Calipers (set) inside and outside	5	NIL
64.	Dowelling jig	2	NIL

65.	Rasps	5	4
F.	**Woodworking Machines**		
66.	Circular saw bench	1	1
67.	Thicknesser (optional)	1	1
68.	Surface planner	1	1
69.	Wood-lathe	2	4
70.	Band saw (optional)	1	NIL
71.	Compressor and spraying units	1	NIL
G.	**Power hand tools**		
72.	Circular saw	1	1
73.	Plan err tar	1	NIL
74.	Orbital sander	1	1
75.	Disc sander	1	1
76.	Jig saw	1	NIL
77.	Blower	1	NIL
78.	Sprayer	1	NIL
79.	Drill	1	NIL
H.	**Others**		
80.	Electric plant	1	NIL
81.	Dust bin	1	NIL

82.	Spade	1	2
83.	Thruck /van	1	NIL
84.	Tool rack	1	NIL
I.	**Consumable materials**		
85.	Wood	As available	Available
86.	Nails of various sizes	As available	✓
87.	Wood glue	As available	NIL
88.	Plyboard	As available	Available
89.	Sand paper	As available	✓
90.	Tiner	As available	✓
91.	Paint	As available	✓
92.	Fittings	As available	✓