

**SKILLS IMPROVEMENT REQUIRED OF FURNITURE MAKING TEACHERS FOR
MAINTAINING WOODWORK EQUIPMENT IN TECHNICAL COLLEGES IN NIGER
STATE**

BY

JAAFAR ABDULHAKEEM RAJAB

2016/1/62200TI

**DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION
SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION
FEDERAL UNIVERSITY OF TECHNOLOGY
MINNA, NIGER STATE**

APRIL, 2023

**SKILLS IMPROVEMENT REQUIRED OF FURNITURE MAKING TEACHERS FOR
MAINTAINING WOODWORK EQUIPMENT IN TECHNICAL COLLEGES IN NIGER
STATE**

BY

JAAFAR ABDULHAKEEM RAJAB

2016/1/62200TI

**A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF INDUSTRIAL
AND TECHNOLOGY EDUCATION FEDERAL UNIVERSITY OF TECHNOLOGY
MINNA
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF
BACHELOR OF TECHNOLOGY DEGREE (B.TECH) IN INDUSTRIAL AND
TECHNOLOGY EDUCATION**

APRIL, 2023

DECLARATION

I JAAFAR ABDULHAKEEM RAJAB with matriculation number 2016/1/62200TI an undergraduate of the Department of Industrial and Technology Education certify that the work embodied in this project is original and has not been submitted in part or full for any Diploma or Degree of this or any other university.

JAAFAR ABDULHAKEEM RAJAB
2016/1/62200TI

Sign and Date

CERTIFICATION

This project has been read and approved as meeting the requirement for the award of B.Tech in (Wood work Technology) Education, Industrial and Technology Education, School of Science and Technology Education, Federal University of Technology Minna, Niger State.

Dr. Hassan, A. M
Supervisor

Signature & Date

Dr. T. M. Saba
Head of Department

Signature & Date

External Examiner

Signature & Date

DEDICATION

This research work is dedicated to Almighty Allah who has been my source of Strength, Grace and Wisdom throughout the period of my study, through whose Grace and Favor I have been able to run my course and scale through the hurdles of my academic pursuit

ACKNOWLEDGMENT

In the name of Allah the beneficent the merciful, Allah to whom all the praise and thanks be to. Lord of mankind, in and all that exist. The most Gracious, the most merciful, the only owner and the only ruling judge of the day of the recompense. May the peace and blessing of Allah be upon our noble Prophet Muhammad (S.A.W).

I wish to express my profound gratitude to my project supervisor in person of Dr. Hassan Abdullahi Muhammad for his guidance, correction and support.

My appreciation goes to Alhaji Jafaru Abdullahi, Hajiya Laraba Jafaru and Hajiya Hauwa Zailami for their contribution towards my academic carrier my Almighty Allah reward them abundantly.

My appreciation also goes to Abdullahi I. Abdullahi, Arc. Abdulrasheed Jaafar and also to my lovely sister Amina Jaafaru who contributed her effort emotionally and financially towards my educational career.

My sincere appreciation also goes to sister Nafisa and also Sahura, Aunty Aisha, Abba, Aunty Haira, Aunty Sadiya above all my thanks goes to everyone that contributed to the success of my programmes in one way or the other, thanks to you all.

ABSTRACT

This study examined the skills improvement required of furniture making teachers for maintaining woodwork equipment in technical colleges in Niger State. Three research question was developed to guide the study and three null hypothesis was tested at 0.05 level of significance It employed a survey research design. The study used a four-point scale questionnaire which contains a total of 28-items, as instrument. In all, 30 furniture making teachers and 16 woodwork practical instructors in technical colleges made up the sample for the study, giving rise to a total sample size of 46. The result showed that Remove circular saw blade, Sharpen circular saw blade Oil and grease screws and slides in planer, machine, Sharpen band saw blade, Repair of broken band saw blade, Sharpen ripsaw teeth, Sharpen cross-cut saw teeth, Sharpen hand plane blades Sharpen planer machine blades, Remove and replace planer machine blades The study recommended among other things, that the Federal and State Ministries of Education should ensure that Sharpening of the scraping blade of a scraper this will improve the effectiveness the tool, The habit of removing of clogged materials at spray gun nozzle will help the live span of the tools, Remove circular saw blade for the machine when in use this will reduce hazard in the workshop, Oil and grease screws and slides in planer, machine should be habit of every woodworkers.

TABLE OF CONTENTS

Title Page	i
Declaration	ii
Certification	iii
Dedication	iv
Acknowledgement	v
Abstract	vi
Table of Contents	vii
CHAPTER ONE: INTRODUCTION	
1.1 Background of Study	1
1.2 Statement of the Problem	3
1.3 Purpose of the Study	4
1.4 Significance of the Study	5
1.5 Scope of the Study	6
1.6 Research Questions	6
1.7 Hypotheses	7
CHAPTER TWO: LITERATURE REVIEW	
2.1 Conceptual Framework	8
2.1.1 Concept of Vocational and Technical Education	8
2.1.2 Woodwork Technology	11
2.1.3 Furniture Making in Technical Colleges	12
2.1.4 Furniture Making Teachers in Technical Colleges	14
2.1.5 Skill in Furniture Construction	17

2.1.6	Modern Woodwork Technology Tools and Equipment	21
2.1.7	Problems Encountered in the Utilization of Woodwork Equipment	22
2.1.8	Maintenance of Tools and Equipment Skills	24
2.2	Theoretical Framework	27
2.2.1	Theory of Skill Development	27
2.2.2	Required Assessment Theory	28
2.3	Review of Related Empirical Studies	30
2.4	Summary Reviewed Literature	33

CHAPTER THREE: RESEARCH METHODOLOGY

3.1	Research Design	34
3.2	Area of Study	34
3.3	Population of the Study	34
3.4	Sample	34
3.5	Instruments for Data Collection	35
3.6	Validation of Instrument	35
3.7	Reliability of the Instrument	35
3.8	Administration of the Instrument	36
3.9	Method of data collection	36
3.10	Method of Data Analysis	37
3.11	Decision Rule	37

CHAPTER FOUR: PRESENTATION AND ANALYSIS OF DATA

4.1	Research Question 1	38
4.2	Research Question 2	39

4.3	Research Question 3	40
4.4	Hypotheses I	41
4.5	Hypotheses II	42
4.6	Hypotheses III	43
4.7	Findings of the Study	44
4.8	Discussion of Findings	44
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMEDATIONS		
5.1	Summary of the Study	47
5.2	Implications of the Study	47
5.3	Contribution to Knowledge	47
5.4	Conclusions	48
5.5	Recommendations	49
5.6	Suggestions for Further Research	49
	REFERENCES	50
	APPENDICES	55

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Technical Colleges are one of the principal technical and vocational institutions saddled with the responsibility for training craftsmen in Nigeria. These institutions play vital roles in Technological development in Nigeria. They are designed to offer theoretical and practical education for the acquisition of skills as well as basic scientific knowledge at the secondary school level (National Board for Technical Education, 2001). Technical Colleges are established to train craftsmen for industry as well as making individuals to be self-employed and create jobs in the struggle towards technological advancement.

Technical education, of which furniture craft is a part, is that aspect of education, which involves the acquisition of techniques and application of the knowledge of the science for the improvement of man's surrounding. It deals with the training of manpower from professional category such as engineers and technologists through the technician down to the skilled category, which includes craftsmen and artisans. The contribution of furniture craft to the development of a nation cannot be disputed as this profession is embraced and recognized worldwide. Many nations have benefited in no small measure in the development of their various sectors of the economy through furniture craft.

According to Encyclopedia furniture craft is the process of working with wood to create individual parts, assemblies, or large scale structures. Miller (2014), sees furniture making as a discipline which aimed at training students on the use of wood in order to help them in materials selection for a particular job, train them on how to differentiate the techniques and approaches for a specific

work and teach them how to utilize the safety rules and regulations in the workshop. In view of the above therefore, occupations in the furniture craft, woodwork as construction, carpentry and joinery, machine woodworking will be available and at a higher degree demand.

According to Hornby (2005), furniture making is the activity of making objects out of wood in an artistic and skillful way. Technology is the study, mastery and utilization of manufacturing and industrial methods (Abubakar, 2010). Technology is the systematic application of the knowledge of science to practical tasks in industry, the know-how of doing things. Furniture craft as drawn from the above definitions is the application of scientific knowledge in the activity of making objects-out of wood in an artistic and skillful way. In other words, it is the totality of all the processes involved in the production of wood articles.

Furniture craft in the Technical colleges is subject/trade that is aimed at studying the Technical competencies in trade-related areas which include furniture making, carpentry and joinery machine woodworking shop practice. Furniture making according to Vilaton (2010) refers to activities of using wood for the purpose of construction and other associated project and design activities. The Technical College furniture craft curriculum is designed to meet requirements necessary to prepare students for employment, self-reliance and/or entrepreneurial ventures. Furniture craft according to the Federal Ministry of Education, (2014) is a vocational subject offered at the senior technical colleges and Technical Colleges level for the purpose of enabling students to acquire further knowledge and develop skills. It exposes students to career opportunity by exploring usable options in the world of work, and enable youths to have an intelligent understanding of the increasing complexity of technology. The achievement of the above stated objectives would depend on the mode of instruction and motivation of students in the study of furniture craft which is one of the technical education subject by the teacher.

Recognizing the importance of Technical education in general and furniture making in particular, in National Development of Nigeria, Federal Ministry of Education, (2014) listed furniture making as one of the subjects to be studied at all levels of educational institutions. Furniture craft is also one of the subjects for which specialist teachers should be provided at all educational levels. The inclusion of furniture craft at technical institutions prepares minds of youngsters to the opportunity for technological development. Students that completed technical college programmes according to FGN, (2014) shall have the opportunity to secure employment either at the end of the whole course or after completing one or more modules of employable skill. Also, the student could be able to set up their own business and become self-employed and be able to employ others and in addition pursue further education in tertiary institutions like Polytechnics, Colleges of Education (Technical) and universities. The goal of Technical education that starts from Technical colleges according to Salami (2011) is to produce trained manpower in technology and be equipped with knowledge in craft, advance craft, with Technical knowledge and vocational skills that are necessary for individual who shall be self-reliant in contemporary Nigeria. These individuals are to be guided in the vocational skill training. It is on the basis of these inadequacies that the researcher seeks to find out the skills required by teachers to carry out practical activities and maintenance of woodwork equipment used in technical colleges in Niger State.

1.2 Statement of the Problem

Most of the technical colleges in the study area have woodwork workshops that are poorly equipped and most of the graduates of furniture making lack some of the skills required to enable them practice their trade effectively. Uzoagulu (2011) stated that the major problems of developing technical education in Nigeria are inadequate and non-functional training facilities caused by unskilled teachers in the maintenance of the facilities. This situation has a far reaching effect on

both the products of the programme and the achievement of programme goals. When students are not exposed to enough practical due to lack or inadequate tools and equipment or given practical instruction with non-functional equipment resulting from unskilled maintenance of the equipment, such students look naive and uncomfortable at manipulations of some workshop equipment they were denied of using in their institutions. Also such students can recall to heart part of machine and how they operate, yet they lack the skill to maintaining them.

The prevalence of woodwork graduates, unemployment and even the fact that employed ones are not performing, makes one query the adequacy and effective utilization of woodwork equipment due to lack of maintenance. It is against this backdrop therefore that the study is undertaken to assess the skill improvement needs of furniture making teachers for maintaining woodwork equipment in technical colleges in Niger State.

1.3 Purpose of the Study

The aim of this study is to identify the skills needed by furniture making teachers to carry out maintaining activities on woodwork equipment in technical colleges in Niger State. Specifically this study seeks to identify the;

1. Skills required by furniture making teacher in maintenance of saws, planning and joint making tools and equipment in technical colleges in Niger state.
2. skills required by furniture making teacher in maintenance of assembling tools (screwdriver, spirit level, square, power drill etc) and equipment in technical colleges in Niger state.
3. Skills required by furniture making teacher in maintenance of wood finishing tools (brush, air compressor, abrasives etc) and equipment in technical colleges in Niger state.

1.4 Significance of the Study

The finding of the study would be of benefit to furniture making teachers, National Board for technical education, curriculum planners, students and society in general.

Furniture making teachers will benefit from the study by which they will be enlighten with skills on how to planning, cutting and joint making as well as wood project assembling, finishing and finishes application and maintenance of tools. Also the teachers would be upgraded with the skill that would help them to teach students effectively in woodwork skills in wood workshops. NBTE would benefit from the finding of the study as the finding would help them to see the need for provisions of tools and equipment as well as training of teachers to update their knowledge and skills for the benefit of the students.

Curriculum planners would also-benefit from the finding of the study. The study will highlight skill areas in cutting, planning, joint, assembling of project, finishing and finishes application, as well as maintenance of wood work tools and equipment that required teachers to be a breast of. This will enable planners to incorporate such skills into woodwork training curriculum for teachers.

Students would benefit from the finding of study because when teachers are fully equipped with the required skills, they will in still this knowledge in the students. The students will therefore learn better and be able to work effectively after graduation.

Generally, society would also benefit from the finding of the study because as student graduated with employability skills, it would be easy for such student to get employed or become self-employed and even employ others. This would reduce societal problems such as kidnapping, arm robbery and other social vices prevalent in the society.

1.5 Scope of the Study

This study is delimited to skills needed by furniture making teachers to carry out maintaining activities on woodwork equipment in technical colleges in Niger state. These includes the skills required by furniture making teacher in maintenance of saws, planning and joint making tools and equipment in workshops in technical colleges, skills required by furniture making teacher in maintenance of assembling tools (screwdriver, spirit level, square, power drill etc) and equipment in workshops and skills required by furniture making teacher in maintenance of wood finishing tools (brush, pleasure can, abrasives etc) and equipment in workshops in technical colleges in Niger state.

1.6 Research Questions

The following research questions are formulated to guide the study:

1. What are the maintenance skills required by furniture making teacher in maintenance of saw, planning and joint making tools and equipment in technical colleges in Niger state?
2. What are the maintenance skills required by furniture making teacher in maintenance of assembling tools (screwdriver, spirit level, square, power drill etc) and equipment in technical colleges in Niger state?
3. What are the maintenance skills required by woodwork technology teacher in maintenance of wood finishing tools (brush, air compressor, abrasives etc) and equipment in technical colleges in Niger state?

1.7 Hypothesis

The following hypotheses was tested at 0.05 level of significant:

H₀₁: There is no significant difference in the mean responses of teachers and instructor on the skills required by furniture making teacher in maintenance of saw, planning and joint making tools and equipment in technical colleges in Niger State.

H₀₂: There is no significant difference in the mean responses of teachers and instructor on the skills required by furniture making teacher in maintenance of assembling tools (screwdriver, spirit level, square, power drill etc) and equipment in technical colleges in Niger State.

H₀₃: There is no significant difference in the mean responses of teachers and instructor on the skills required by furniture making teacher in maintenance in wood finishing tools (brush, air compressor, abrasives etc) and equipment in technical colleges in Niger State.

CHAPTER TWO

2.0 LITERATURE REVIEW

This chapter presents a literature review on this study. The following review is organized under the following;

- Conceptual framework
- Theoretical framework
- Review of Related Empirical Studies
- Summary of reviewed literature

2.1 Conceptual Framework

2.1.1 Concept of Vocational and Technical Education

Roberts (1965) described vocational education as an integral part of total education programme contribution towards the development of good citizens by developing their physical, social, civic, cultural and economic competencies. As contained in the Encyclopedia Americana (International Edition) (1991), the aim of vocational education is to prepare young people and adults for useful occupations, particularly for skilled trades and semiprofessional careers. It also may update the knowledge and skills of workers in occupations of this kind. Similarly, The Federal ministry of Education, Nigeria (2004) defined Vocational and Technical Education (VTE) as a Comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. VTE consists of vocational training packages or educational activities for improving people's current careers and vocational training packages or educational activities for the

unemployed. VTE is important as it enriches a person for life and it provides the competences which are necessary in a democratic society. Societal and economic development depends on the strength of VTE as it provides access to skills and entry routes into the labour market. For underprivileged and marginalized groups in particular, it can be an important route towards a better life.

Vocational technical education is undoubtedly a very important aspect of the Nigerian educational system. It develops occupational competence and teaches those skills which enable an individual earn a living as stated by Okorie (2001). The National Policy on Education (2004) defined vocational technical education as that aspect of education which leads to the acquisition of practical and applied skills as well as basic scientific knowledge. Nwogu (2009) quoting Okonkwo (1993), declared technical vocational education as viable industries and a prerequisite to new world technological order and therefore requires adequate support of human and material resources. Immaculate (2005) in his opinion said “that technical and vocational education are leaving experience meant to be impacted to an individual systematically in order to get him\her adequately equipped for a good employment in a recognized occupation. The programme includes numerous occupational areas such as agriculture, various trades, health services and technical training (Brickmen 2006). Vocational, technical education and training therefore is as an educational training, which has been designed technically and systematically to accommodate both the trainer and the trainee in order to enable most importantly the trainee acquire the basic knowledge, skills abilities, understanding and attitudes needed for ones efficient performance in his/her chosen occupational carrier for self-reliance and national development.

There are numerous challenges facing vocational technical education and training which has affected in a negative way our lives and national development. Among the numerous challenges as identified by Nwogu and Nwanoruo (2008) are:

1. Lack of skilled man power,
2. Acute shortage of vocational technical teachers
3. Lack of adequate training facilities and equipment
4. Inadequate vocational, technical education policies
5. Lack of follow –up and continuity in government policies
6. Poor funding of vocational technical education
7. Poor remuneration of vocational technical teachers;
8. Lack of entrepreneurship education in vocational technical education and training
9. Lack of adequate security/security needs
10. Poor emphasis on the practical aspect of vocational technical education as most tertiary institutions charged with the responsibility to teach vocational technical education subjects in Nigeria today are poorly equipped with machines and relevant tools/equipment.

Young people and adults increasingly recognize that vocational skills are needed for participation in the world of work. For governments, public technical and vocational education and training (TVET) is seen as essential for enhancing economic competitiveness and for contributing to social inclusion, poverty reduction and sustainable development. As well as responding to labour market trends, public TVET is expected to equip learners with basic skills and to support personal and social development. Employers are increasingly emphasizing the need for new “soft” skills, such as communication, negotiation and team working, in addition to technical knowledge and ability.

2.1.2 Woodwork Technology

Woodworking is the skill or activity of making wooden objects. It is also referred to as the parts of a house or room that are made up of wood. The programme in woodwork technology will give an individual best possible knowledge related to wooden materials and industrial production of wood items meeting up with the needs and expectations from the wood based industry.

Combining the skills acquired with the specific knowledge in wood and wood technology, make the learner to become an attractive competence at the labour market. Woodwork technology programme has a pronounced project-oriented profile in Technical colleges. The teachers of woodwork technology trade in Technical colleges have the train the woodwork students in both the theoretical studies as well as the more practical projects work.

This is due to the ever increasing need for more advanced technology used by the industries to be competitive (Portal, 2007). According to Pam (2004), woodwork technology as part of vocational technical education is that types 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. This type of education provides skill, knowledge and attitudes necessary for effective employment in specific occupation (Okoro, 1993). Woodwork technology in Technical colleges therefore, involves the engagement of both furniture making teachers and students in theory and practical activities. In this respect, students will become familiar with main aspects involved in the design and development of new and existing woodwork production based on customer need, technology and processes. Teacher of woodwork technology in Technical colleges should have the knowledge of a wide range of production machinery currently used in the advanced woodworking industry and modern woodwork technology hand tools.

2.1.3 Furniture Making in Technical Colleges

Furniture Making is one of the vocational education trades in Nigerian technical colleges. It is designed to meet the need of craftsmen that will repair, construct and maintain all kinds of furniture items. Furniture making in technical colleges is geared towards the production of technicians and craftsman who have skills, attitude, and knowledge to meet the demand and the development in the Furniture Making industries. These craftsmen and technicians are expected to design, construct and repair modern furniture. Technical colleges admit and train both males and females in Furniture Making and other vocational areas. FRN (2014), stressed that NABTEB awards National Technical Certificate and Advanced National Technical Certificate to the graduate of Furniture Making. Furniture Making is all about making use of wood to solve human problems. It is one of the trades offered in technical colleges (FRN, 2014). Furniture Making at technical college is classified as a vocational education course (*Blakemore & Robbie, 2006*). Okoro (1999) defined vocational education as any form of education whose primary purpose is to prepare person for employment in recognized occupations.

Francis (2013) also defined vocational education as vocational technical training or retraining which is given in school or classes under public supervision and control or under contract with a state board or local education agency. He maintained that it is conducted as part of programme designed to prepare individuals for gainful employment as semi-skilled workers or technicians or sub-professionals in advanced occupations and new and emerging occupations or the prepare individuals for employment in advanced education programme.

Vocational Education from Technical Education. Vocational Education according to FRN (1998) is that form of education which is obtainable at the technical colleges, equivalent to the senior

secondary education but designed to prepare individuals to acquire practical skills, basic and scientific knowledge and attitude required as craftsmen and technicians sub-professional level. Okoro (2000) stated that the term vocational education and technical education are used interchangeably to refer to the same type of education. The two terms are by no means synonymous. Technical education is a post -secondary vocational training programme whose major purpose is the production of technicians. Olaitan (2009) observed Vocational and Technical Education as a type of education given to an individual in order to enable him or her develops the creative and manipulative potentials inherent in him or her for the use of man. FRN, (2004), UNESCO and ILO (2002) education is combined with technical education. Hence, technical and vocational education is used as "a comprehensive term referring to those aspects of the education process involving, in addition to general education, the study of technologies and related sciences and the acquisition of economic and social life. According to Federal Republic of Nigeria (2004), the goals of technical and vocational shall be to:

- i. Provide trained manpower in the applied sciences technology and business particularly at craft, advanced craft and technical levels.
- ii. Provide the technical knowledge and vocational skills necessary for agricultural, commercial, economic developments.
- iii. Give training and impart the necessary skills to individuals who shall be self- reliant economically.
 - a. In pursuance of the above goals according to FRN (2014), the curriculum for each trade, such as Furniture Making under discussion, shall consist of:
- iv. General education

- v. Theory, and related courses
- vi. Workshop practice
- vii. Industrial training or production work and small business management and entrepreneurial training.

It is also stated in the National Policy on Education that any trainee who complete Furniture the technical college trade programme shall either set up their own business and become self-employed and be able to employ others; or secure employment either at the end of the whole course, or pursue further education in advance craft technical programme and in post-secondary institution such as science and technical colleges, polytechnics, college of education (technical) and universities. Graduates of Furniture Making from technical colleges can be self-employed after graduation or work in Furniture Making industries as artisans/technicians or further their technical careers in the colleges of education (technical), polytechnics, colleges of technology, universities etc.

National Business and Technical Examination Board conducts entrance examination for technical colleges while the National Board for Technical Education (NBTE) coordinates the activities of technical colleges in Nigeria.

2.1.4 Furniture Making Teachers in Technical Colleges

According to Pam (2004), Furniture Making technology as part of vocational technical education is that types of training intended to prepare the students to earn a living in an occupation in which success dependent largely on understanding of technology as applied to modern technology and design. This type of education provides skill, knowledge and attitudes necessary for effective

employment in specific occupation (Okoro, 2008). Furniture Making technology in technical colleges therefore, involves the engagement of both Furniture Making teachers and students in theory and practical activities. In this respect, students will become familiar with main aspects involved in the design and development of new and existing Furniture Making production based on customer need, technology and processes. Teacher of Furniture Making in technical college should have the knowledge of a wide range of production machinery currently used in the advanced Furniture Making industry and modern Furniture Making technology hand tools.

In order to understand the needs and requirements of technical college teacher, it is necessary to elaborate on some of the diverse ways in which they practise. Based on the scarce information available from the studies referred to above, it is possible to distinguish the following basic professional profiles of teachers, trainers and instructors in technical and vocational education and training (TVET):

- Teachers or lecturers working in formal school or college settings and providing instruction in vocational courses;
- Instructors and laboratory assistants working in school or college settings in vocational laboratories who teach with a high degree of autonomy or sometimes act as assistants to other vocational teachers;
- Trainers, tutors and others in enterprises who integrate training and education functions into their jobs to varying degrees (for example, from incidental to full-time teaching of trainees and apprentices) – in dual systems of vocational education, for instance, this function is often separated from human resource development functions within some companies, while in others this distinction is not strongly maintained;

- Instructors and trainers working in labour market training institutions supported by governments and public authorities, often with a strong focus on social inclusion and basic occupational competences;
- Instructors and trainers working in employers' organizations, such as chambers of commerce, sectoral training institutions or privately owned training companies and providers that focus on upgrading technical competences, training in communication skills, etc. (Grollmann & Rauner, 2007).

Here, the convention is to refer to all those categories of teaching staff as vocational teachers who are working in institutions mainly devoted to the purpose of vocational learning and education, and not in enterprises or directly within the work process. However, some of the major professional challenges remain the same for all the different categories listed.

Sackey (2009) viewed Furniture Making technology in technical colleges as a written course aimed to meet the need of a range of syllabus lacking emphasis on practical procedure added that Furniture Making technology is a versatile and career avenue. Students start to learn when they are involved in the learning situation. At present we have Furniture Making technology teachers who emphasize more on theoretical aspects in the Furniture Making workshops with no emphasis on practical work due to lack of improved skills in practical. This indicates that if Furniture Making technology course is well taught especially in terms of practical in technical colleges, many of the students graduating from the technical colleges will engage in Furniture Making related business or open their own Furniture Making workshops instead of waiting for government work.

Grollmann & Rauner, (2007) discovered that more than 60 per cent of the staff teaching Furniture Making technology in technical colleges could not perform the skills or provide technical services

they were expected to teach other despite their high level paper qualification. This is of course due to lack of improved skills or non-skill acquisition from their respective institutions. Therefore, the development of Furniture Making in Nigeria technical colleges cannot be achieve without adequate, qualified and skilled Furniture Making teachers, modern tools and equipment as well as well facilities to enable our country achieve economic and technological advancement. But with prevailing problems of Furniture Making trade, its dependence as base for the nations progress cannot be reality except quick steps are taken forestall it.

Olumese (2004) pointed out that teaching is a process of facilitating learning. Therefore, for effective teaching of Furniture Making technology to take place, it is considered quite appropriate that prospective teachers should interact with the prevailing teaching environment. This is due to the fact that the importance of teaching Furniture Making in our technical colleges cannot be over emphasized, considering the unemployment rate in the country and the job opportunities offered by the Furniture Making trade. This indicates that Furniture Making in Nigerian technical colleges can also provide a better basis for educational and skills development for both the teachers and students respectively.

2.1.5 Skill in Furniture Construction

Skill acquisition is the major focus of Technical College program. However, education at this level is generally referred to as vocation. The major purpose of vocational education is not to give certificate only, but to train skill workers who can actually function in their respective place of work. Technical vocational education and training (TVET) is designed to prepare an individual to acquire practical skills, basic and scientific knowledge and attitudes required as craftsmen and technician at sub-professional level (NBTE, 2003). The success of any plan to prepare students for

the above occupation depends upon ability of the educational programs in our technical colleges to be responsive to both the student employability skill development needs and prospective employer's skills requirement.

Francis (2013) observed that the current investment programs in various sectors of the Nigerian economy have major implication for work force development, as there is rise in demand for skilled personnel. It is no doubt therefore, that if Nigeria is to benefit fully from modern era of technological skill development and practices, our technical colleges skill development programs must deliberately and adequately create and provide workplace-like learning environment, communicate employer-like expectations for basic skill application, functionality, dependability, thoroughness, decision-making capability and cooperation provide students opportunities to practice and perfect these skills and traits. This will in turn, enhance the desirable employability qualities of skills development related to self-confidence and general self-esteem to make the trainees fit for employment in the current changing complex world of work that demands employees to be creative, flexible and possess good interpersonal and managerial skills. This implies that skill development can be accomplished through work experience, education in the school workshops and laboratories. What is vital is to build a better means of integrating academic education, skill training and work experience.

People have been using natural objects, such as tree stumps, rocks and moss, as furniture since the beginning of human civilisation. Archaeological research shows that from around 30,000 years ago, people began constructing and carving their own furniture, using wood, stone, and animal bones. Early furniture from this period is known from artwork such as a Venus figurine found in Russia, depicting the goddess on a throne. The first surviving extant furniture is in the homes of Skara Brae in Scotland, and includes cupboards, dressers and beds all constructed from stone.

Complex construction techniques such as joinery began in the early dynastic period of ancient Egypt. This era saw constructed wooden pieces, including stools and tables, sometimes decorated with valuable metals or ivory. The evolution of furniture design continued in ancient Greece and ancient Rome, with thrones being commonplace as well as the klinai, multipurpose couches used for relaxing, eating, and sleeping (*Blakemore & Robbie, 2006*).

The development of skills varies with the nature complexity and the type of activity. People who opt for skill development should among other things, possess abilities, interest, aptitudes, patience, personality and other human or physical qualities that will enable them succeed in it. It is commonly misconceived that the development of skill requires low brains. In deed most skill development activities present great challenges to the learner on the integration of the practical work, theoretical fields, common sense, good power observation and courage (Egbita, 2006).

For the development of skills, Okoro (2008) opined that all technical courses irrespective of their levels and objectives must stress practical activities. Any technical course in which a large proportion of the allocated time is not devoted to practical activity or work, project or experiment, is not likely to be adequate and very successful. Perhaps it is in this direction that the Federal Government establish regulatory bodies such as the National Board for Technical Education (NBTE) in 1977 to among others function, control the standard of technological education and to ensure that no vocational and technical institutions starts any programme without its (NBTE) inspection and approval, and Industrial Training Fund (ITF) in 1971 with aim of promoting and encouraging the acquisition of skills in industries and commerce with a view to generating a pool of indigenous training manpower sufficient to meet the needs of the economy. This implies that for skill development programmes in our technical colleges to be effective, focused, purposeful and industrially oriented, the skill training facilities must be functional and reflect the current

features of related industrial setting. In order to make vocational education real and meaningful for skill development to students, the students Industrial Training Fund (ITF) and made it compulsory for all students of vocational education programmes at all levels with following objectives:

- a. To provide an avenue for students to acquire industrial skill and experience in their course of study especially in Technological, Engineering and applied fields.
- b. To prepare students to work methods and techniques in handling tools, equipment and machinery that may not be available in the educational institutions of learning.
- c. To expose students to work situations they are to meet after graduation.
- d. To make the transition from school to world of work easier and enhance students contacts for later job placement.
- e. To provide students with an opportunity to apply their knowledge in real work situation thereby bridging the gap between college experience and work or practice.
- f. To enlist and strength employers involvement in the entire educational process of preparing students for employment in industry.

Despite the laudable recommendation by the National Board for Technical Education (NBTE) as the highest accreditation body for technical colleges accreditation body in Nigeria; plausible objectives of students industrial work experience scheme (SIWES) and efforts by vocational education to make our technical colleges skill development programmes more focused and meaningful to both the students employability skills needs and prospective employers requirements. Aina (2000) observed that vocational technical education programmes in Nigeria is faced with problems which militate against its ability to produce adequate quantity and quality of skilled and technical manpower required to lift our country from the abyss of technological

irrelevance and economic depression. Comments from other vocational educators (Oranu, 2000; Francis, 2013; Olaitan 2005) also show that the facilities in our vocational and technical institutions (technical colleges inclusive) have remained elusive, obsolete and non-functional. In a related observation, UNESCO (2002) specifically stated that technical colleges in particular suffer from both shortage and low quality of technical teachers and instructors.

2.1.6 Modern Woodwork Technology Tools and Equipment

It is often said that a woodworker is only as good as his tools. Therefore, the place of equipment, tools, and materials should not be left-out in pursuance of ways for teaching any technical subject like woodwork technology. Since every occupation has a body of content which is only particular to it. Students should be trained in such a way as to acquire the habit of doing each job within the occupation in the proper way with proper equipment and tools.

Olaitan (1990) remarked that any school that lack the essential equipment, materials, tools and facilities, cannot achieve most of the objectives of its programme. This implies that technical education requires a great deal of attention with respect to facilities, tools equipment and materials needed for instruction most especially in the present technological advancement in the economic development. It is then certain that nay skill-forming technical course must not only require tools, equipment and other infrastructure, but also raw materials with which learners must work. Therefore, skills are formed basically when learners form, shape, join or treat materials.

Facilities and materials in technical education are those goods and services that help to facilitate teaching and learning process in educational set-up. These include tools, equipment and materials, workshops, classroom, libraries and other utilities etc., which assist education to function and attain goals of acquiring technical skills used in the world of work (Olaitan, 1996). McGraw (2013)

described tools and equipment as those portable and heavy instrument or devices for performing special operation in vocational technical education especially in teaching and learning situations. He also described tools and equipment as device used in the performance of work. Tool applies broadly to a device that facilitates work. It denotes a small manually operated device. It refers to a device for making materials changes on other objects, as by cutting, shearing, striking, rubbing, grinding, squeezing, measuring or other processes. A hand tool is a small manual instrument traditionally operated by the muscular strength of the use. On the other hand, a machine tool is a power-driven mechanisms used to cut, shape or form materials such as wooden items. Tools are main mean by which human beings control and manipulate their physical environment.

In this case, some tools can substitute for other tools, either as a make-shift solution or as a matter of efficiency, but by design, a tool may share key functional attributes with one or more other tools. A multi-tool is a hand tool that incorporates several tools into a single portable device. To modern woodworkers, these types of tools were revolutionary because they were one tool or one device that could do several different things. With this new revolution of tools, the modern woodworker would not have to carry so many tools with them to the job sites. The problem of having to deal with so many different tools was solve with over taking of multi-use tools (Sam, 2006).

2.1.7 Problems Encountered in the Utilization of Woodwork Equipment

Generally, teachers are faced with great problems in the process of discharging their duties in the implementation of woodwork craft practice curriculum based on the new policy (Olorunselu, 1990). One of the greatest problems facing utilization of technical courses in most underdeveloped countries like Nigeria is lack of woodwork equipment.

Olaitan (1996) stated that there is always a minimum of staffing, funding and equipment beyond which an effective vocational education programme cannot be executed. This is true of woodwork trade programmes.

Inadequate Funding

Inadequate funding in Technical colleges gives the impression of being capital intensive and cannot be adequately implemented with poor funding. Accordingly, technical and applied skills could not manifest from ordinary reading of handout and pictures of simulated tools and equipment (Akpan, 1999). Based on this, lack of adequate fund is one of the major problem confronting Technical colleges in Nigeria.

The allocation of funds to schools is insufficient to run the programme in various Technical colleges. As a result of insufficient allocation of funds to schools some of them have no workshop, in some cases unqualified teachers were employed and some of the equipment were not enough to go round the classes. The outcome was that the much needed practical training was not given.

Inadequate Trained Industrial Technical Teachers

The most acute problem of technical teacher is the shortage of qualified teachers, the very few science students who opt for teaching and the qualified technical teachers leave to join industry where the grass is greener. Worse still, most of the technical teacher do not have adequate industrial experience which is a necessity for effective and efficient instruction. It has also been found that the way few skill instructors use teaching as a stepping stone to better employment. Akpan (2000), explained that the factors which hinder the growth of industrial technical teacher education, could be traced to the acute shortage of suitable trained and qualified teachers. The reason for the shortage might also be traced to unattractiveness of the teaching profession such that it is difficult

to recruit and retain industrial technical teachers at all levels of education system. Beside this problem appears further complicated by massive drift of industrial technical teachers to private and other public sector-jobs because of poor remuneration.

Inadequate/Non-functional Woodwork Equipment

It could be observed that in industrial technical teacher education certain equipment are designed to enhance the teaching of skills in some subjects without this equipment such skills cannot be acquired. Idika (1997), observed that one of the major reasons. Some industrial technical teachers leave the teaching field could be the no provision of adequate woodwork equipment.

As Adesina (1998), explained that in one of the higher institutions in the country, workshop to house tools and equipment does not exist, in one department, existed the workshop with equipment and tools in some other places, but no electricity and workshop, the equipment were not installed. The facilities in the industrial technical teacher education institution inadequate which has resulted in effective teaching.

2.1.8 Maintenance of Tools and Equipment Skills

Life cannot go on unless it is systematically sustained. This is one of the reasons why animals eat to nourish their bodies. In the times of sickness, health restoration is sought through medication. What can be said of human beings can also be said to machines and tools. They too require adequate maintenance, and in times of breakdown, complete repairs have to be effected. Maintenance is essential to reduce failure rate and ensure machine operation (Abdullahi, 2002).

Maintenance is the art of carrying out a systematic supporting service on any device or being (Parrish, 1993). Maintenance refers to reactivating activity mainly to preserve existing goods, equipment and services for the betterment of people or the entire society (Fadkani, 1998).

Maintenance involves the systematic supply of necessary materials for the continuous operation of a given equipment. These include: Lubricants, grease, fluid and water. Olaitan Nwachukwu, Oyemachi, Igbo and Ekong (1999), defined maintenance as taking specific approved steps and precautions to care for a piece of equipment, machinery or facility to ensure that it attains its specific maximum functional shelf-life. Makun (2000) remarked that the concern of any programmes of maintenance is to extend the useful life of the assets, ensure efficiency in the functioning of machines at all times, and enhance the readiness of machines. Orikpe (1994) defined maintenance as deliberately planned action aimed at ensuring that a given piece of equipment functions as specified by the manufacturers. This involves planned supply of necessary materials for the continued operation of the equipment. According to the author, maintenance refers to the appropriate and timely steps and precautions taken to ensure that a given piece of equipment attains maximum life span.

Usman (1995) remarked that, maintenance of equipment and other material resources involves: Lubrication, cleaning, care, repair and safety. Maintenance, therefore, denotes all actions, carried out on structures, machines, equipment and tools to keep, restore or improve every facility to an agreed standard, determined by the balance between needs and resources. The actions include:

- i. Keeping and restoring actions, such as repairs, replacement and cleaning.
- ii. Improving, which include refurbishment, rehabilitation, alterations, conversion extension and adaptations.

Olaitan (1996) classified maintenance into three groups namely prevention maintenance, predictive maintenance and corrective maintenance. In preventive maintenance, attempt is made to prevent the equipment or facilities from breaking down through regular cleaning, lubricating, painting and servicing. Predictive maintenance on the other hand implies watching out for danger

signals, such as unusual noise, danger light indicators and inefficiency of performance; and wresting the situation promptly before there is any major breakdown. This may involve minor errors, which could be corrected by replacement of weak parts. Corrective maintenance involves approaches for rectifying an already damaged or breakdown equipment or machinery. The effort of corrective maintenance is to ensure continuity within the operations and production framework.

Obiegbo (1994) classified maintenance into three kinds: preventive (planned/ periodic) maintenance, curative (accidental) maintenance and renovation/refurbishment maintenance. According to the author, preventive maintenance is the type of maintenance carried out at predetermined intervals or other prescribed criteria and is intended to reduce the likelihood of an item not meeting an acceptable condition. This consists of taking corrective or preventive action in order to avoid exerted or avoidable failures. Obiegbo on the other hand, used curative maintenance in place of corrective maintenance. This is the maintenance work done to restore, that is carry out repair of the failure that occurred or maintenance action intended to bring back an item to its original appearance or state.

The success of woodwork programme depends largely on the effectiveness of furniture making teachers to operate, use and maintain the basic woodwork equipment provided in the school workshops. Where furniture making teachers could not operate, use and maintain woodwork equipment for continuous use in training of woodwork students, technical training will suffer and this will lead to the production of highly unskilled personnel who are unemployable and unproductive.

As stated by Uzoagulu (1998), competent furniture making teachers with functional equipment would enable schools achieve functional educational objectives. The functionality of equipment can only be ensured through prompt maintenance because central focus of furniture making

teachers is the production of competent and skill full woodwork personnel who would be effective in the performance of woodwork skills (Ekong, 2000).

2.2 Theoretical Framework

2.2.1 Theory of Skill Development

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

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

recommended that a well-equipped furniture craft workshops and functional machines must be provided, this will enable the individual to marry theory with practice.

2.2.2 Required Assessment Theory

The required assessment theory was propounded by Good and Brophy (1997). The theory stated that “A required develops and motivated behaviours only if an individual is expose to a certain pressure which is require to be assessed; the desire to satisfy or gratify these needs directs or dictates human behaviour”. Some individual theorists have made greater inputs with their conceptual scheme motivation which have implication for classroom teachers. Reisebry (1990) has noted that personality development can be described as a combination of a press and a need. According to Reisebery each theme in an individual life is characterized by the existence of a require in relation to a particular press, a stimulus situation that has a potential influence upon the life of the organism.

Abraham Maslow developed the hierarchy of needs in 1940-1950s, and the hierarchy of need theory remains valid today for understanding human motivation, management training, and personal development. Indeed, Maslow’s ideas surrounding the hierarchy of required concerning the responsibility of employers to provide a work place environment that encourages enables employees to fulfil their own unique potential (self-actualization) are today more relevant than ever.

In his own view, Cannon (1991) saw need gratification as the basis for human behaviours. He urged that required are arranged in a hierarchy of their existence or importance. These required include aesthetic required, desire to know, self-actualization required, esteem required, love and belonging required, safety required and psychological required. Thus as one general type of require

is satisfied, another higher order of needs will emerge and become operative in life. These levels of required are also classified into being required and deficiency required. The deficiency required can be satisfied only by others. This shows that an individual can depend on others as a source of need gratification. That of self-actualization desire to know and aesthetic required are the being needs.

Kaufman (1998) said that required assessment is the formal process of identifying needs as gaps between current and desired results planning those required in priority order based on the cost to meet each need versus the cost of ignoring it, and selecting the most important needs (problems or opportunities (for reduction or elimination)). This definition emphasizes that needs are gaps in result rather than gap of deficiencies in process or resources. It asks the user to assess the discrepancy between what is and what should be in terms of results, and to compare the magnitude of these gaps in results against the cost to close or ignore them. These definitions and related approach to require assessment couples productivity with effectiveness. Therefore, nearly all the approaches see the usefulness of require assessment for obtaining and allocating resources for projects.

This theory is related to this study because Onwuka (1982) emphasized that the fact that before any in-service education programme can be established, the felt need of teachers who will participate in such a programme must be ascertained. Therefore, perceived needs of teachers must be considered and also in-service-education training should be structured to permit their active involvement in order to improve their practical skills. Moreover, the furniture making teachers should concern themselves with the efforts to find out how best to structure their workshops activities so that students will be opportune and encouraged to satisfy their individual needs. Thus, the occasional and appropriate involvement of students and their needs in the planning of

curriculum and instruction and also systematic exposure to environmental process will lead to some reasonably strong interest in the students especially in woodwork practical projects.

2.3 Review of Related Empirical Studies

Muhammad, Yahaya, and Hassan (2019). Study the skills improvement need of woodwork teachers in Technical Colleges of Yobe state was influenced by the great concern about the future and continuity of woodwork as a skill oriented course which equip learners with relevant life skills. Three research questions guided the study. Descriptive survey research design was adopted and the population was 36 woodwork teachers. A structured questionnaire consisting of 71 items was developed and used for data collection. Mean and standard deviation were used to answer research question one and two while z-test analysis was used to establish the skills improvement need for research question three. The findings revealed that the teachers need re-training in construction of wooden articles. It was recommended that teachers should regularly be sent on professional courses and engages in commercial activities to update and boost their competencies in skills for teaching activities in schools workshops.

Jibrin, Okwori, Hassan, and Jatau, (2018). Carried out a study on skills improvement need of woodwork teachers in Technical Colleges of Kano state” was influenced by the great concern about the future and continuity of woodwork as a skill oriented course which equips learners with relevant life skills. Three research questions guided the study. Descriptive survey research design was adopted and the population was 36 woodwork teachers. A structured questionnaire consisting of 71 items was developed and used for data collection. Mean and standard deviation were used to answer research question one and two while z-test analysis was used to establish the skills improvement need for research question three. The findings revealed that the teachers need re-training in construction of wooden articles. It nm recommended that teachers should regularly be

sent on professional courses and engage in commercial activities to update and boost their competencies in skills for teaching activities in schools workshops.

Mannir, Bala, and Hassan (2020). Identified the practical skills possessed and skills required by furniture construction teachers in Zamfara and Katsina State, Nigeria. Three research questions that sort to determine the skills needs of furniture construction teachers were answered and one hypothesis was tested at 0.05 level of significance. A descriptive survey research design was adopted for the study. The population for the study was 42 teachers. A structured questionnaire was used to gather data from the 42 woodwork furniture construction teachers. The instrument had a reliability coefficient of 0.89 using Cronbach Alpha statistic. Mean and standard deviation was used to answer research questions and a t-test was used to test the hypothesis using the IBM SPSS version 20. The findings of the study revealed that the respondents required skills on the ability to hold a saw with fore-finger straight out on one side of the handle, the ability to follow the “FEWTEL” method in preparing a piece of wood require further training, setting sliding bevel when marking out dovetail joint and selection of the right adhesive according to the purpose and type of wood as well as amount of force the adhesive would be subjected to required skills. It was recommended that; government should provide opportunities for furniture construction teachers to go on further training on the modern furniture construction technology required. The identified skills required by teachers of furniture construction should form the basis for the up-skill workshop to be organized as in-house training.

Fagbemi (2001) conducted a study to find out the skills improvement required of furniture making teachers for maintenance of woodwork equipment in senior technical colleges in Ekiti state. Specifically, three research questions and two hypotheses were addressed. The population of the

study was made up of all the furniture making teachers who are currently engaged in the teaching of woodwork in the senior technical colleges in Ekiti state. There was no sampling as the entire population was used for the study. Questionnaire was used for data collection from the respondents. Frequency distribution, mean and t-test were used in analyzing the data. Result of the study showed that, furniture making teachers in Ekiti state did not acquire the skills required for maintenance of woodwork equipment during their per-service training, in addition, lack of fund, lack of spare parts, lack of incentives to motivate technical teachers and poor maintenance culture hindered the ability of technical teachers in carrying out maintenance work on technical equipment in technical colleges. The results also revealed that furniture making teachers need skill re-training on the maintenance of woodwork equipment. Result of hypotheses tested at 0.05 level showed that effective performance at the senior technical colleges was not influenced by experience. Recommendations were made based on the Findings of the study. These include: Organizing re-training programme inform of seminars, workshops, or in-service training on the maintenance of equipment for furniture making teachers in addition, adequate provision of funds to purchase spare parts and materials for maintenance of woodwork equipment. The study conducted by Fagbemi has good relationship with the present study under taking by the researcher because the two studies are concern with identification of skills required by furniture making teachers in managing wood workshops and also the two studies uses a structured questionnaire for data collection and mean and t-test statistic are used in answering the research questions and hypotheses testing. The differences in the two studies is that the former dealt with only one aspect of skill in woodwork that is maintenance skill while the former is dealing with many skills which includes: cutting, planing, joint making, assembling, finishing and maintenance of tools and equipment.

2.4 Summary Reviewed Literature

The review of literature related to this study is presented under the conceptual and theoretical framework. In the conceptual framework a schema is used to show the relationships of the variables in the study. The review of the available literatures showed that furniture making teachers require skills in order to be able to effectively carry out their activities in wood workshops especially in the aspect of maintenance. Some of the skills identified in the reviews include: Wood preparation skills, wood assembling skills, wood finishing skills and maintenance of tools and equipment skills. Competencies required by furniture making teachers to effectively carry out the above listed skills were enumerated in the review.

With regards to the related empirical studies reviewed, it has been discovered that many authors work on management and maintenance skills required by furniture making teachers for improvement of wood workshop operations. From the study, it was revealed that furniture making teachers lack the required skill to be able to effectively conduct themselves in the workshop. However, this researcher feels that the skills identified by the researchers, despite the fact that the skills are lacking by the furniture making teachers, it still insufficient. There are other important skill areas that are not covered by the studies reviewed which a woodwork teacher requires to effectively carry out wood workshop activities, these are: wood preparation skills, assembling skills, finishing skills and maintenance of tools and equipment skills. This is the gaps, which this study sought to fill.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This chapter describes the research design of the study, area of the study, population, sample, and instrument for data collection and validity of the instrument, method of data collection and method of data analysis.

3.1 Research Design

In order to achieve the stated objectives of this research study, descriptive survey was adopted because it involves the use of questionnaires and interviews to determine the views of the respondents' opinion. So descriptive survey design is considered suitable for this study.

3.2 Area of the Study

The study will be carried out in technical colleges in Niger State. These include; Government Technical College Kontagora; Government Technical College, New Bussa; Suleman Barau Technical College Suleja, Government Technical College Pandogari, Government Technical College Eyagi-Bida, Government Technical College Minna and Federal Science and Technical College Schiroro–Kuta.

3.3 Population of the Study

The population for the study is 30 respondents consisting of 14 furniture making teachers and 16 woodwork practical instructors in technical colleges in Niger State.

3.4 Sample

The total population of 30 respondents was used for the study, hence there was no sampling carried out.

3.5 Instrument for Data Collection

The instrument used for data collection was structured questionnaire developed by the researcher for the study. It consists of two (2) parts. Part I consists of Bio-data and Part II consist of instructions to guide the respondents on how to complete the questionnaire and also contains section (A-C) of according to the research question. Section A has to do with the maintenance skills required by furniture making teacher in maintenance of cutting, planning and joint making tools and equipment in workshops. While section B is about the maintenance skills required by furniture making teacher in maintenance of assembling tools and equipment in workshops. Section C is on with the maintenance skills required by furniture making teacher in maintenance of wood finishing tools and equipment in technical colleges in Niger State.

3.6 Validation of the Instrument

The instrument for data collection was given to (3) three lecturer in Industrial and Technology Education (ITE) Department, Federal of Technology, Minna. For both face and content validity. The essence of this is to correct, comments and suggest on appropriateness and suitability of the instrument.

3.7 Reliability of the Instrument

In order to ensure the internal consistency of the instrument, the researcher adopted t -test technique. The instrument was administered on skills improvement required of woodwork teacher for maintaining woodwork equipment in technical colleges in Niger State.

A pilot study was carried out to establish the reliability of the instrument. The instrument was administered to furniture making teachers in Government Technical College, FCT, Abuja.

Eight copies of the validated instrument were administered on the respondents. After two weeks, the same instrument was also administered to the same respondents and Pearson product moment correlation coefficient was used in establishing the stability of the instrument at 0.05 coefficient correlation. The instrument was tested at Government Technical College, FCT, Abuja which is outside the area of study. A four (4) point rating scale will be to analyze the data as shown below.

Strongly Agree (SA) = 4points

Agree (A) = 3 points

Disagree (D) = 2points

Strongly Disagree (SD) = 1 point

$$\frac{4 + 3 + 2 + 1}{4} = \frac{10}{4} = 2.5$$

3.8 Administration of the Instrument.

The instrument used for the data collection was administered to the respondent by the researcher and a researcher assistant for the study area selected for this research.

3.9 Method of data collection

All the 46 respondents were administered with the questionnaire. A research assistant also assisted during the administration of the instrument. The researcher administered the questionnaire to the respondents and the completed questionnaires were collected from the respondents. The researcher studied the respondent's response to the items to obtain a satisfactory data.

3.10 Method of Data Analysis

The data collected by the researcher was analyzed using mean and standard deviations and t-test statistics to answer the research questions and to test the hypotheses at 0.05 level of significance.

3.11 Decision Rule

For the research questions any items having a mean of 2.50 and above were interpreted as positive and therefore, accepted and below 2.50 were interpreted as negative and were rejected. The research questions will be answer using the Mean responses of the respondents while t-test statistic will be used to test the Null Hypotheses at 0.05 level of significance. Therefore, if t-calculated is greater than or equal to t-table then we reject the Null hypothesis but if t-calculated is less than t-table we accept the Null hypothesis.

CHAPTER FOUR

4.0 PRESENTATION AND DATA ANALYSIS

This chapter deals with the presentation and analysis of data with respect to the research questions formulated for this study, the result of this data analysis for the research questions are presented as follows.

4.1 Research Question 1

What are the skills required by furniture making teachers in maintenance of cutting, planning and joint making tools and equipment in wood workshops in Technical colleges in Niger State?

Table 1: Mean Responses of Furniture making teachers and Woodwork Practical Instructors on the skills required by furniture making teachers in maintenance of cutting, planning and joint making tools and equipment in wood workshops in Technical colleges in Niger State

S/N	ITEMS	X ₁	X ₂	X ₃	Remarks
1.	Ability to remove circular saw blade	3.30	3.55	3.43	Agreed
2.	Sharpen circular saw blade	3.30	3.15	3.23	Agreed
3.	Oil and grease screws and slides in planer, machine	3.30	2.95	3.13	Agreed
4.	Sharpen band saw blade	3.70	3.40	3.55	Agreed
5.	Repair of broken band saw blade.	3.50	2.90	3.20	Agreed
6.	Sharpen ripsaw teeth	2.90	2.55	2.73	Agreed
7.	Sharpen cross-cut saw teeth.	3.00	2.55	2.78	Agreed
8.	Sharpen hand plane blades	3.90	3.30	3.60	Agreed
9.	Sharpen planer machine blades.	3.40	2.90	3.15	Agreed
10.	Remove and replace planer machine blades.	3.80	3.60	3.70	Agreed

KEYS: X₁ = Mean of Furniture making teachers, X₂ = Mean of Woodwork Practical Instructors, X_a = Average mean of Furniture making teachers and Woodwork Practical Instructors, N₁ = Numbers of Furniture making teachers, N₂ = Numbers of Woodwork Practical Instructors

The data presented in the Table 2 revealed that the mean values of all items ranged from 2.73 to 3.70 which is above the cut-off point of 2.50. An indication that all the respondents agreed with

the items on the skills required by furniture making teachers in maintenance of cutting, planning and joint making tools and equipment in wood workshops in Technical colleges in Niger state.

4.2 Research Question 2

What are the skills required by furniture making teachers in the maintenance of assembling tools and equipment in wood workshops in Technical colleges in Niger State?

Table 2: The Mean Responses of the Furniture making teachers and Woodwork Practical Instructors on the skills required by furniture making teachers in the maintenance of assembling tools and equipment in wood workshops in Technical colleges in Niger State

S/N	ITEMS	X ₁	X ₂	X ₃	Remarks
1.	Providing temporary and permanent guards to assembling machines	3.10	2.50	2.80	Agreed
2.	Oil and grease rotating parts in assembling machines	2.90	2.40	2.65	Agreed
3.	Replacement of broken drills, Allen keys and other assembling tools	2.90	2.70	2.80	Agreed
4.	Sharpen nails and screwdriver	3.80	2.35	3.08	Agreed
5.	Ability to remove and replacement of broken hammer handle	3.60	2.95	3.28	Agreed
6.	Keeping metallic try-squares away from moisture	3.40	2.80	3.10	Agreed
7.	Storing Glue in a cool dry place	3.70	3.15	3.43	Agreed
8.	Rethreading or replacement of worn out threads of clamps	3.60	2.30	2.95	Agreed

KEYS: X_1 =Mean of Furniture making teachers, X_2 = Mean of Woodwork Practical Instructors, X_A = Average mean of Furniture making teachers and Woodwork Practical Instructors, N_1 = Numbers of Furniture making teachers, N_2 = Numbers of Woodwork Practical Instructors

The data presented in the Table 2 revealed that the mean values of all items ranged from 2.65 to 3.43 which is above the cut-off point of 2.50. An indication that all the respondents agreed with the items on the skills required by furniture making teachers in the maintenance of assembling tools and equipment in wood workshops in Technical colleges in Niger State.

4.3 Research Question 3

What are the maintenance skills required by furniture making teachers for wood finishing tools and equipment in wood workshops in Technical colleges in Niger State?

Table 3: The Mean Responses of the Furniture making teachers and Woodwork Practical Instructors on the maintenance skills required by furniture making teachers for wood finishing tools and equipment in wood workshops in Technical colleges in Niger State

S/N	ITEMS	X ₁	X ₂	X ₃	Remarks
1.	Sharpening of the scraping blade of a scraper	3.80	3.20	3.50	Agreed
2.	Storing of Grease and oils in a cool dry place	3.60	3.15	3.38	Agreed
3.	Oil and grease moving parts in finishing machines	3.60	2.95	3.28	Agreed
4.	Removing of clogged materials at spray gun nozzle	3.70	3.35	3.53	Agreed
5.	Replacement of bent scraper blade and bent spray gun nozzle	3.40	3.45	3.43	Agreed
6.	Replacement of worn out rollers used in finishing	3.70	3.60	3.65	Agreed
7.	Replacement of bad sandpaper after use with good ones	3.50	3.45	3.48	Agreed
8.	Sharpening of blunt Scraper blade	3.50	3.35	3.43	Agreed
9.	Oil and Grease Screws and slides in Planner machine	3.80	3.50	3.65	Agreed
10.	Replacement of broken scraper blade	3.80	3.55	3.68	Agree

KEYS: X₁ = Mean of Furniture making teachers, X₂ = Mean of Woodwork Practical Instructors, X_A = Average mean of Furniture making teachers and Woodwork Practical Instructors, N₁ = Numbers of Furniture making teachers, N₂ = Numbers of Woodwork Practical Instructors

The data presented in the Table 2 revealed that the mean values of all items ranged from 3.28 to 3.68 are above the cut-off point of 2.50. An indication that all the respondents agreed with the items on the maintenance skills required by furniture making teachers for wood finishing tools and equipment in wood workshops in Technical colleges in Niger State.

4.4 Hypothesis One

There is no significant difference between the mean responses of the Furniture making teachers and Woodwork Practical Instructors on the skills required by furniture making teachers in maintenance of cutting, planning and joint making tools and equipment in wood workshops in Technical colleges in Niger State.

Table 4: t-test Analysis of Furniture making teachers and Woodwork Practical Instructors regarding the skills required by furniture making teachers in maintenance of cutting, planning and joint making tools and equipment in wood workshops in Technical colleges in Niger State

S/N	ITEMS	SD ₁	SD ₂	T-cal	Remarks
1.	Remove circular saw blade	1.00	0.59	-0.73	NS
2.	Sharpen circular saw blade	0.64	0.79	0.56	NS
3.	Oil and grease screws and slides in planer, machine	0.90	1.02	0.96	NS
4.	Sharpen band saw blade	0.46	0.86	1.24	NS
5.	Repair of broken band saw blade.	0.67	0.77	1.20	NS
6.	Sharpen ripsaw teeth	1.04	0.92	0.90	NS
7.	Sharpen cross-cut saw teeth.	1.00	0.97	1.17	NS
8.	Sharpen hand plane blades	0.30	1.10	1.28	NS
9.	Sharpen planer machine blades.	0.92	0.94	1.39	NS
10.	Remove and replace planer machine blades.	0.40	0.80	0.91	NS

KEYS: SD₁ = Standard deviation of Furniture making teachers, SD₂ = Standard deviation of Woodwork Practical Instructors, t-cal = t-calculated, T- Critical = 1.960, NS = Not significant

The results in Table 4 above indicate that calculated t value of all the items were less than the critical value (1.960) at 0.05 level of significance. Therefore, the null hypothesis which says there is no significant difference between the mean ratings of Furniture making teachers and Woodwork Practical Instructors on the skills required by furniture making teachers in maintenance of cutting, planning and joint making tools and equipment in wood workshops in Technical colleges in Niger State is accepted

4.5 Hypothesis Two

There is no significant difference between the mean responses of the Furniture making teachers and Woodwork Practical Instructors on the skills required by furniture making teachers in the maintenance of assembling tools and equipment in wood workshops in Technical colleges in Niger State.

Table 5: t-test Analysis of Furniture making teachers and Woodwork Practical Instructors regarding the skills required by furniture making teachers in the maintenance of assembling tools and equipment in wood workshops in Technical colleges in Niger State

S/N	ITEMS	SD ₁	SD ₂	T-cal	Remarks
1.	Providing temporary and permanent guards to assembling machines	1.14	1.02	1.41	NS
2.	Oil and grease rotating parts in assembling machines	0.94	1.07	1.31	NS
3.	Replacement of broken drills, Allen keys and other assembling tools	1.14	1.00	0.47	NS
4.	Sharpen nails and screwdriver	0.40	1.01	1.60	NS
5.	Remove and replacement of broken hammer handle	0.49	0.92	1.52	NS
6.	Keeping metallic try-squares away from moisture	0.66	0.81	1.17	NS
7.	Storing Glue in a cool dry place	0.46	0.91	1.20	NS
8.	Rethreading or replacement of worn out threads of clamps	0.49	1.05	4.62	NS

KEYS: SD₁ = Standard deviation of Furniture making teachers, SD₂ = Standard deviation of Woodwork Practical Instructors, t-cal = t-calculated, T- Critical = 1.960, NS = Not significant

The results in Table 4 above indicates that calculated t value of all the items were less than the critical value (± 1.960) except item 8 at 0.05 level of significance. Therefore, the null hypothesis which says there is no significant difference between the mean ratings of Furniture making teachers and Woodwork Practical Instructors on the skills required by furniture making teachers in the maintenance of assembling tools and equipment in wood workshops in Technical colleges in Niger State is accepted

4.6 Hypothesis Three

There is no significant difference between the mean responses of the Furniture making teachers and Woodwork Practical Instructors on the maintenance skills required by furniture making teachers for wood finishing tools and equipment in wood workshops in Technical colleges in Niger State.

Table 6: t-test Analysis of Furniture making teachers and Woodwork Practical Instructors on the maintenance skills required by furniture making teachers for wood finishing tools and equipment in wood workshops in Technical colleges in Niger State

S/N	ITEMS	X ₁	X ₂	SD ₁	SD ₂	T-cal	Remarks
1.	Sharpening of the scraping blade of a scraper	3.80	3.20	0.40	0.93	2.47	NS
2.	Storing of Grease and oils in a cool dry place	3.60	3.15	0.656	1.01	1.46	NS
3.	Oil and grease moving parts in finishing machines	3.60	2.95	0.66	1.12	1.99	NS
4.	Removing of clogged materials at spray gun nozzle	3.70	3.35	0.64	0.85	1.26	NS
5.	Replacement of bent scraper blade and bent spray gun nozzle.	3.40	3.45	0.66	0.86	-0.18	NS
6.	Replacement of worn out rollers used in finishing	3.70	3.60	0.46	0.80	0.43	NS
7.	Replacement of bad sandpaper after use with good ones	3.50	3.45	0.67	0.92	0.17	NS
8.	Sharpening of blunt Scraper blade	3.50	3.35	0.81	0.85	0.47	NS
9.	Oil and Grease Screws and slides in Planner machine	3.80	3.50	0.40	0.87	1.29	NS
10.	Replacement of broken scraper blade	3.80	3.55	0.40	0.86	1.09	NS

KEYS: SD₁ = Standard deviation of Furniture making teachers, SD₂ = Standard deviation of Woodwork Practical Instructors, t-cal = t-calculated, T- Critical = 1.960, NS = Not significant

The results in Table 4 above indicates that calculated t value of all the items were less than the critical value (1.960) except item 1 and 3 at 0.05 level of significance. Therefore, the null

hypothesis which says there is no significant difference between the mean ratings of Furniture making teachers and Woodwork Practical Instructors on the skills required by furniture making teachers in the maintenance of assembling tools and equipment in wood workshops in Technical colleges in Niger State is accepted

4.7 Summary of Findings

Based on the data collected and analyzed, the findings related to the skills required by furniture making teachers in maintenance of cutting, planning and joint making tools and equipment in wood workshops in Technical colleges in Niger state, revealed that the respondents agreed with all the items listed in table 1.

Findings related to the skills required by furniture making teachers in the maintenance of assembling tools and equipment in wood workshops in Technical colleges in Niger state, revealed that the respondents agreed with all the items listed in table 2.

Findings related to the maintenance skills required by furniture making teachers for wood finishing tools and equipment in wood workshops in Technical colleges in Niger state, revealed that the respondents agreed with all the items listed in table 3.

4.8 Discussion of the findings

The maintenance skills required by furniture making teachers in cutting, planning and joint making in wood workshops in tertiary institutions were analyzed and established as being required by furniture making teachers. This finding is in line with Sara (2000) that more than 60 per cent of the staff teaching woodwork in tertiary institutions could not perform the skills or provide technical services they were expected to teach others despite their high level paper qualification. Therefore, there is need for retraining of teachers to update their knowledge and skills in woodwork.

The analysis of research question two presented in table 4.2 provided such findings as indicated by the Mean ratings of furniture making teachers, the maintenance skills required by furniture making teachers in assembling of woodwork projects in wood workshops were all agreed as being required. This indicates that teachers are deficient in maintenance skills in assembling woodwork projects tools and equipment. This called for retraining of furniture making teachers, to keep them abreast with the trend of events. This finding is in line with Hackett (1979) who pointed out that the purpose of retraining is a means of improving the present job performance.

There should be constant retraining of furniture making teachers to make them up-to-date for effective discharge of their duties in the wood workshop.

The analysis of the research question three as analyzed in table 4.3, the findings of this table shows that all the maintenance skills that are needed on wood finishing and finishes application by furniture making teachers for effective performance in the wood workshops are required by the teachers. Therefore, there is the need for re-training of furniture making teachers for better performance in the workshop. According to Fitts (1977), a comprehensive knowledge of the skills and competencies in finishing of woodwork projects and tactful selection of wood finishes is essential for teachers of woodwork of higher education level. Fitts (1977) explained that a competent woodwork teacher must be skilled in the selection of appropriate materials in guiding the students to carry out successful projects using the selected materials through planned practical activity.

In the analysis of the three research questions presented, the findings revealed that the skills required by furniture making teachers in maintenance of tools and equipment in wood workshops are required. This can be achieved based on the findings, through practical training of teachers. Oranu (1996) suggested that maintenance of tools and equipment should be the responsibility of

the technical teachers after the installation, to keep the equipment in good condition for effective use. The results also revealed that furniture making teachers required maintenance skills in the area of servicing, replacement of parts and sharpening of tools. This supports the earlier findings of Banjo (1974) that staff of tertiary institutions could not perform the skill or technical services they were to teach to others. In ability to acquire maintenance skills on the woodwork tools and equipment lead to ill-prepared teachers. Therefore, there should be constant re-training of technical teachers to expose them to uses and maintenance of the latest tools and equipment.

Tertiary institution teachers should not only be resourceful in order to use equipment and tools in the workshop but should also maintain and manage properly the available ones.

The result of the null hypothesis shows that there is no significant difference in the maintenance skills required by experienced and less experienced furniture making teachers on wood cutting, planning, joint making, assembling, finishing and finishes application as well as maintenance of tools and equipment. This means that the skill required by experienced and less experienced teachers are the same.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATION

This Chapter describes the Summary the Study, Implication of Findings, Conclusion, Recommendations and Suggestions.

5.1 Summary of the Study

The main focus of this research study was to find out the skill improvement required of furniture making teachers for maintaining woodwork equipment in technical colleges in Technical colleges in Niger state.

The statement of problem, purpose significance, scope assumption of the study research question and hypothesis were all stated, tested and discussed appropriately in line with the topic.

Three research questions were formulated for the study and two null hypotheses were also drawn. The target population for the study was 30 furniture making teachers and 16 woodwork instructors in Technical Colleges in Niger State, were used as respondents for the study. The data for the study were analyzed by using mean, standard deviation and t-test. The null hypotheses were tested at 0.05, level of significance. The findings revealed the skill improvement required of furniture making teachers for maintaining woodwork equipment in technical colleges in Technical colleges in Niger state. Implications of the study and conclusions were also drawn from the findings and discussed. Recommendations and suggestions for further study were formulated and stated according to the findings of the study.

5.2 Implications of Findings

The findings of this study have far reaching implications the government, technical colleges, furniture making teachers, woodwork instructors and the public at large.

The study provides useful information about the skills required by furniture making teachers in maintenance of cutting, planning and joint making tools and equipment in wood workshops in Technical colleges in Niger State.

The study has also unveiled several ways improving the skills required by furniture making teachers in the maintenance of assembling tools and equipment in wood workshops in Technical colleges in Niger state. Nigeria. If these findings are sincerely accepted and actively implemented by the furniture making teachers and woodwork instructors, it would imply an increment in the skills of the students and exposure to proper safety conducts (prevention of the loss of skilled manpower through death and injuries also prevent damages to equipment and materials in their workshops). It will also help the customers in quantifying the quality of the work offered by the woodworkers so as to enable them choose the best among the woodworkers.

5.3 Contribution to Knowledge

Furniture making teachers will be better equipped with practical skills to perform more effectively in tier various jobs and assignment in the industries.

5.4 Conclusion

From the foregoing, it can be concluded that the skills required by furniture making teachers in maintenance of cutting, planning and joint making tools and equipment in wood workshops unveiled several ways of improving the skills required by furniture making teachers in the maintenance of assembling tools and equipment in wood workshops for adequately observe and effectively use. It is also concluded that several ways of improving the furniture making teachers and woodwork instructor's competency in workshop are numerous and if adequately utilized will increase the skills of woodworkers thereby increasing their job satisfaction and that of the

customers that patronize them, since they will only be satisfied if their work is done to suit their needs.

5.5 Recommendations

The following recommendations are made based on findings of the study.

1. Sharpening of the scraping blade of a scraper this will improve the effectiveness the tool.
2. The habit of removing of clogged materials at spray gun nozzle will help the live span of the tools
3. Remove circular saw blade for the machine when in use this will reduce hazard in the workshop.
4. Oil and grease screws and slides in planer, machine should be habit of every woodworkers

5.6 Suggestion for Further Research.

1. Strategies of improving ICT skill in woodwork technology and maintenance work department.
2. Implementation of ICT training in woodwork technology and maintenance work department.

REFERENCES

- Abdullahi M. (2010). Work skills required by lecturers of building technology for effective teaching in tertiary institutions in northwestern states. Unpublished M.Ed. Thesis, Federal University of Technology, Minna.
- Abdullahi, S. (2002). Electrical installation competencies required by electrical/electronic teachers in Bauchi and Gombe states technical colleges. Unpublished M.Ed Thesis, University of Nigeria, Nsukka.
- Adesina, A. O. (2009). Assessment of NCE Technical Programme in College of Education, Minna Niger State.
- Adesina, S. (1998). The Development of Modern Education in Nigeria. Ibadan: Heinemann Education Book Ltd.
- Adeyemi, J. K. (2000). "Academic Manpower Needs of Nigeria Universities" Higher Education Review, 32(2), Spring, 36-44.
- Agbo. M (2000). Modern Woodworking. South Poland: The Good
- Agusiobo, O. N. (2000). Vocational Guidance. Unpublished Manuscript. Department of Vocational Technical Education, University of Nigeria, Nsukka.
- Essien, E. E. (1 996). An Evaluation of Technical Education Programmes in Technical colleges in Akwalbom State. Unpublished MEd Thesis. Department of Vocational Teacher Education, University of Nigeria, Nsukka.
- Eze, T. I. (1992). Discipline and hard work. The essential ingredients for qualitative technical teacher education. An address presented at the college third matriculation ceremony, Fed. Coll. of Ed. (TechnicaE), Umunze, March, 271h.
- Ezeji, C. 17. (1998). Adequacy of Instructional Materials for Teaching Technical Subject in Technical colleges of Anambra and Enugu State. Unpublished M.Ed. Thesis, Department of Vocational Teacher Education, University of Nigeria, Nsukka.
- Fagbemi, J. A. (2001). Skill improvement needs of furniture making teachers for maintenance of woodwork equipment in senior technical colleges in Ekiti State. Unpublished M.Ed. Thesis. University of Nigeria Nsukka.
- Federal Government of Nigeria (2004;., National Policy of Education. Lagos: National Education Research and Development Council Press.
- Good, T. L. and Brophy, EJ. (1997). Educational psychology: A realistic approach New York: Holt, Reinehart and Winston Inc.
- Houghton, T. (2005). Identification of Woodwork Trade in Technical and Vocational Education in Nigeria. Retrieved on 14-06-05 from <http://www.nesault.ne/?id=16> 1.
- Huffman, G. (2000). Human capital, education and agriculture staff. Department of IOWA State University, Ames. Retrieved online from [9http://www.mps.gov/training/npsynly/nps/histext.htm](http://www.mps.gov/training/npsynly/nps/histext.htm)

- ILO (2002). Technical and vocational education and training for the first century. Retrieved on 2/6/2011 from <http://www.unesco.org/education.html>.
- Jibrin, A., Okwori, R. O., Hassan, A. M. & Jatau, R. S. (2018). Skills improvement need of woodwork teachers in technical colleges of Kano State, Nigeria. *Benue State University Journal of Education*, 18(1), 36-47.
- John-Ekere, J. E. (1994). An evaluative study of workshop tools and equipment necessary for the effective training of students in Technical colleges in Cross River State. Unpublished B.Sc Thesis. Department of Vocational Technical Education, University of Nigeria, Nsukka. *Journal*, (6) 28-32.
- Kaufman, R. (1998). Strategic thinking: A guide to identify problems. American Society for Training and Development. Washington, D.C.: International Society for Performance-Improvement Arlington Press.
- Lawal, A. G. (2001). Ways of Procuring Equipment for Technical colleges. A paper presented at the National Conference Organized by COEASUFCE Panshin on the 2nd - 5th May.
- Idika, V. (1997). "Factors that Influence the Retention of Technical Teachers in Abia State Secondary School. Unpublished M.Ed Thesis. Department of Vocational Teacher Education, University of Nigeria, Nsukka.
- Mannir, M.S, Bala, M.M., & Hassan, A.M. (2020). Furniture Construction Skill Gap Analysis Among Technical College Teachers In Zamfara and Katsina States. *Journal of Technological and Vocational Education Pendidikan Teknologi dan Kejuruan*, 26(2), 107-118
- Maxwell, G. N. (2001). Assessing relevance in technical education NBEA Year Book. National Institute for Educational Development NIED (1998). Ministry of Basic Education and Culture. Okahandja, Namibia.
- Muhammad A. H., Yahaya, A. D. & Hassan, M. B. (2019). Skills improvement need of woodwork teachers in technical colleges of Yobe State, Nigeria. *International Journal of Innovative Information Systems, & Technology Research*, 7(1):39-49.
- National Institute for Educational Development NIED (1998). Ministry of Basic Education and Culture. Okahandja, Namibia.
- Newell, K. M. (1991). Motor skill acquisition. *Annual Review of Psychology*, 42, 213-220.
- Nwana (1993). Equipment for skill acquisition. Retrieved on 24-6-05 from [http://www.file://A.Equipment~20operator~20Training%20in~020intemet2/23/0606](http://www.file://A.Equipment%20operator~20Training%20in~020intemet2/23/0606).
- Nwandu (1994). Technical Education in Nigeria: Which Way Forward *Gombe Technical Education Journal*, 2:73-85.
- Nwankwo, J. I. (1998). *Effective Management of Executive*. Ibadan: Spectrum Books Limited.
- Nwankwo N A (1993). A study of the problems of developing technical education in Nigeria and its implication for industrial development. Unpublished B.Sc Thesis, Department of Vocational Teacher Education. University of Nigeria, Nsukka.

- Nwosu (2000). Entrepreneurship in Vocational and Technical Education A paper resented at the National Conference on Entrepreneur Education held at F.C.E. (Tech), Umuze.
- Obiegbu, M. E. (1994) Maintenance of infrastructure: impaction to national development, the builders, the professional builder, Journal of the Nigerian institute of Building (1), 12-19
- Oduh, F. O. (1993). Cost and maintenance of equipment in vocational business education: Impactions for self-reliance. Journal of Nigeria Vocational Association (NVA), (2), 375-380.
- Oduh, J. O. (1993). Cost and maintenance of equipment in vocational business education: Implication for self-reliance Vocational Technical Education an Selfreliance Nsukka. Nigerian Vocational Association.
- Ofsted, O. (2007). Adults courses: Practical furniture making level 1. Retrieved on January 20, 2013 from <http://www.bridgewater.ac.uk/course/php?sector=2&sub>
- Ogundeji, A. O. (2002), Issues in and challenges facing technical education graduates in Nigeria. Bichi journal of Technology Education (1), 99.
- Ogwo. B. A. & Oranu R. N. (2006). Methodology in formal and non-formal technical/vocational education. Enugu: Ijejas Printers and Publishers Company.
- Okala, O. J. (1993). A study of the facilities utilization for effective teaching and learning of (automobiles) mechanical practice in technical colleges in south &stern states. Unpublished MEd Thesis, Department of Vocational Teacher Education, University of Nigeria, Nsukka.
- Okorie J. U. (1993). Vocational/technical education and self-reliance: An overview of the development of vocational/technical education in Nigeria. Nigeria Vocational Association, 5 (2), 17-22.67
- Okorie, J. U. & Ezeji, S. C. O. A. (1988). Element of guidance, vocational and career education. Onitsha: Summer Educational Publishers Nigeria Ltd.
- Okorie, J. U. (2001). Vocational industrial education. Bauchi: League of Researchers in Nigeria (L.R.N).
- Okoro, O. M. (1993). Principles and method in vocational and technical education. Nsukka University Trust Publishers.
- Okoro, O. M. (2000). Principles and Methods in Vocational and Technical Education. Nsukka, University Trust publishers.
- Okoro, O. M. (2005). Programme evaluation in education. Enugu: Pacific Publishers Ltd.
- Olaitan S O (1990). Education Tax Fund and its Implication for Vocational Technical
- Olaitan, S. O. (1992). Theory and Practice of Vocational Teacher in Africa. Calabar Centaur Press.
- Olaitan, S. O. (1996). Vocational and technical education in Nigeria: Issues and analysis. Onitsha: Noble Graphic Press Publishing.

- Olaitan, S. O., (199). Education Tax fund and its Implication for Vocational Technical Education. Being a paper presented at the 30th Convocation Ceremony of the Federal College of Education (Technical) Akoka, Lagos held on Thursday, May 6th.
- Olaitan, S. O., Nwachukwu, C. E., C. A. Onyemachi, G.A., Ekong, A.O. (1999). Curriculum Development and Management in Vocational Technical Education. Onitsha: Cape Publishers International Ltd.
- Olaniyan, J. (2000). Availability and Use of Audio-visual Teaching Resources in Teaching Agricultural Science. Unpublished B.Sc Thesis, Department Vocational Teacher Education, University of Nigeria, Nsukka.
- Olorunselu (1990). Introductory Technology Towards Industrialization of Nigeria Education Today. Journal Published by Federal Ministry of Education, I (2):31-35.
- Olu (1991). Technical and Vocational Teacher Training as a Strategies for Technical Development. The Nigeria Teacher Volume No. I.
- Omorodion, G. O. (1999). Generating a high Maintenance Culture at the Enterprise Level. Business Times, 8-11.
- Onwuegbuna, R. O. (2003). Assessment of the utilization level of facilities for teaching and learning of Metalwork in Vocational Technical Colleges in Benue State of Nigeria. Unpublished M.Ed. thesis, University of Nigeria, Nsukka
- Onwuka, U. (1992). Curriculum Development for Africa. Onitsha: African F&P.
- Onwuka, U. (1982). In-service training of primary school teachers in the four eastern states of Nigeria: Selected case study. An Inset African Project Press.
- Onwuka, U. (2000). In-service Training of Primary School Teacher in the Four Eastern States of Nigeria: Selected Case Studies. An Inset African Project.
- Onyemachi, G. A. (2004) Management skills required by teachers for improvement in operating woodwork laboratory in technical colleges of Abia and Enugu States. Unpublished thesis, University of Nigeria, Nsukka.
- Opaleye, B. (1990). A maintenance culture. The African Guardian, p.5.
- Oranu, R. N. (1996). Industrial laboratory management Unpublished Mimeographs, University of Nigeria Nsukka.
- Oranu, R. N. (2006). Vocational Education and Manpower Development. A paper presented at the 6th annual conference of Nigeria Vocational association held at Federal College of Education (Technical) Umunze. September 1(1)17-19
- Orikpe, E. A. (1994). Maintenance Culture and Instructional Materials Utilization in Vocational Technical Education in E.U. Anyakoha and E.C. Osuala (Eds) Vocational Technical Education and Technological Growth. Nsukka, Nigerian Vocational Association.
- Ozidi, U. O. (2001) and Ehiamezor (2001). Secondary School Teaching Methods. Summer Publishers Nigeria Ltd.

- Padeiford, H. E. (1983). A conceptual model of psychomotor. *Journal of Industrial Teacher Education*, 20(2), 79-83.
- Pam. S. (2004). Improving technology education towards realization of vision 2010 objectives. *Pankshin Journal of Vocational Education*, 4(1),
- Parrish A (1993). *Mechanical engineer reference book*. Newness, England: Butter Co.
- Parrish. A. (1993). *Mechanical engineer reference book*. Newness, England: Butter Co.
- Portal s, S. (2007). The European study choice platform. Retrieved on January 22, 20,3 from
- Reisbery, L. C. (1990). Curriculum evaluation and modification: An effective teaching perspective. *Journal of intervention in school and clinic*. 26(2), 99-105.
- Sam, L. (2006). *Man, machines and history. The story of tools and machines in relation to socia progress 948*. Cobbet Press. Retrieved on January 23, 2013 from <http://www.answer.com/topic/tool4>
- Sara, T. I. (2000). Policy constraints to the growth of Technology Education programs. *Journal of Technical Education Review*, 2(2) 13-19.
- Soyinbo, B. (2000). *Organizing and Maintaining the Vocational Laboratory*. Harrishbug: Educational Publishing Company.
- Uche, P. K (2004). *Technical and Vocational Education in Nigeria: Issues and Strategies*. Paper presented at the Regional Seminar on Implementing Human Resources, Training and Development. Kaduna, Nigeria.
- Umunadi, E. K. (1993). *Assessment of the Availability and Utilization of Introductory Technology Equipment in Urban and Rural Technical colleges in Delta State*. Unpublished M.Ed Thesis. Department of Vocational Teacher Education, University of Nigeria, Nsukka.
- UNESCO (2002). *Project in support of the revitalization of Technical and Vocational Education in Nigeria*. Opening address at a workshop for Technical College Teachers Northcentral. Federal Polytechnic Bida, 17th - 21st, June 2002.
- UNESCO (IBE) (2014). *World data on Education*.
- UNESCO (UNEVOC) (2014). *Vocational education in Nigeria*.
- Usman, B. (1995). *Maintenance of equipment, lecture mimeograph*, Kaduna Polytechnic, Kaduna. www.ehovv.com/toolsforvwoodworkmg

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA
DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION
QUESTIONNAIRA ON

**SKILL IMPROVEMENT REQUIRED OF FURNITURE MAKING TEACHERS FOR
MAINTAINING WOODWORK EQUIPMENT IN TECHNICAL COLLEGES IN
NIGER STATE**

PART I

BIO-DATA

Please kindly fill in the blanks or tick (V) in the options as provided in the information required below. All information and responses supplied to the item of this questionnaire will be used particularly for the purpose of this research work and will be used confidentially.

The response categories are;

- Strongly Agree (SA) = 4points
- Agree (A) = 3points
- Disagree (D) = 2points
- Strongly Disagree (SD) = 1 point

Please read the questionnaire items carefully and tick (V) the response appropriately in each item.

Furniture making teachers () Woodwork Practical Instructors ()

PART II

Research Question 1: What are the skills required by furniture making teachers in maintenance of cutting, planning and joint making tools and equipment in wood workshops in Technical colleges in Niger State?

S/N	Item Statements	SA	A	D	SD
1	Ability to remove circular saw blade				
2	Sharpen circular saw blade				
3	Oil and grease screws and slides in planer, machine				
4	Sharpen band saw blade				
5	Repair of broken band saw blade.				
6	Sharpen ripsaw teeth				
7	Sharpen cross-cut saw teeth.				
8	Sharpen hand plane blades				
9	Sharpen planer machine blades.				
10	Remove and replace planer machine blades.				

Research Question 2: What are the skills required by furniture making teachers in the maintenance of assembling tools and equipment in wood workshops in Technical colleges in Niger State?

S/N	Item Statements	SA	A	D	SD
11	Providing temporary and permanent guards to assembling machines				
12	Oil and grease rotating parts in assembling machines				
13	Replacement of broken drills, Allen keys and other assembling tools				
14	Sharpen nails and screwdriver				
15	Ability to remove and replacement of broken hammer handle				
16	Keeping metallic try-squares away from moisture				
17	Storing Glue in a cool dry place				
18	Rethreading or replacement of worn out threads of clamps				

Research Question 3: What are the maintenance skills required by furniture making teachers for wood finishing tools and equipment in wood workshops in Technical colleges in Niger State?

S/N	Item Statements	SA	A	D	SD
19	Sharpening of the scraping blade of a scraper				
20	Storing of Grease and oils in a cool dry place				
21	Oil and grease moving parts in finishing machines				
22	Removing of clogged materials at spray gun nozzle				
23	Replacement of bent scraper blade and bent spray gun nozzle				
24	Replacement of worn out rollers used in finishing				
25	Replacement of bad sandpaper after use with good ones				
26	Sharpening of blunt Scraper blade				
27	Oil and Grease Screws and slides in Planner machine				
28	Replacement of broken scraper blade				
29	Replace or recondition of worn out tools				