

**SKILL GAP ANALYSIS AMONG METAL WORK CRAFTMEN FOR SELF-
EMPLOYMENT IN ABUJA.**

BY

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2016/1/62407TI**

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

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**A RESEARCH PROJECT SUBMITTED TO THE
DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION,
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OF BACHELOR OF TECHNOLOGY DEGREE (B.TECH) IN INDUSTRIAL AND
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MARCH, 2023.
DECLARATION

I Dan Z. Barnabas, with the Matriculation Number “2016/1/62407TI” an undergraduate student of the Department of Industrial and Technology Education, declare 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.

DAN Z. BARNABAS
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Signature & Date

CERTIFICATION

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

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Sign and Date

DEDICATION

This project is dedicated to God almighty who in his infinite grace and mercies made this research work a success. Also to my loving parent Mrs Rifkatu Barnabas and Mr. And Mrs Gideon Gudu Barnabas.

ACKNOWLEDGEMENT

I appreciate God Almighty for his mercy upon me and other members of my nuclear family during this programme. My sincere appreciation is expressed to my project supervisor, Mr. Steven N. Yisa for patiently going through my project work with me, likewise his unflinching support and guardian. It is with this sense of appreciation that I sincerely acknowledge the HOD of the ITE Department Dr. T. M. Saba and all my lecturers and members of the ITE Department for all their imparted in me.

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Abstract

This study was carried out to analyse the skill gap among metalwork craftsmen for self-employment in Abuja. Survey research design was used for the study. The population for the study was 30 metalwork craftsmen, 20 metalwork engineers and 6 metalwork teachers. A random sampling technique was adopted for the engineers in the metal work industry. The absence of sampling for the craftsmen and teachers of the technical colleges in Abuja is as a result of the relatively small size of the population, there was no need for sampling. The population was manageable, the entire population was used to carry out the study. A structured questionnaire which was designed by the researcher was used as the instrument for data collection from the respondents. The instrument was validated by three experts. Three research questions guided the study, while three null hypotheses formulated were tested at 0.05 level of significance. Mean and standard deviation were used to answer the research questions, while t-test was employed to test the hypotheses. It was found out that all the 24 skills suggested are required by metalwork craftsmen for self-employment in Abuja. Therefore it was recommended that all the skills identified in the study be included in the training given to metalwork craftsmen for in Abuja

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the study

In this era, ever since human kind smelted gold and formed it into object, the craft of metalwork has grown to encompass art and industry bringing them hand in hand, making the metal worker shaped his wares, and shaped our world as well. It has been used to, improve our lives as tools are forged to beautify our surrounding with metal art and to make weapons to end life all together. The history of metalwork is long dating back to 6000bc and became later what we know as the metals of antiquity. Seven metals are liberally the foundation for which civilization was based. The metals are: Gold 6000bc, copper 4200bc, silver 4000b, lead 3500bc, tin 1750bc, iron 1500bc and mercury 750bc. Later over the centuries more metals were discovered. According to the royal society of chemistry (2022), there are now 94 known metals listed on the periodic table. There also are countless alloys that are derived from these. Metals are very useful materials they possess many properties, such as strength, toughness, stiffness and many more. When heated, metals can be shaped into many things from a tiny paperclip to a huge aircraft. They are good conductors of electricity and heat which make them useful in diverse areas in the world's development today.

Metal work is a process of working with metals to create individual parts, assemblies or large scale structures. The term covers a wide range of work from large ships, bridge, engine parts and delicate jewelry. It therefore includes a correspondingly wide range of skills, processes and tools. Metalwork is a science, art, hobby, industry and trade. It has evolved from the discovery of

smelting various ores to producing malleable processes, through diverse and specialized means. The Most commonly metalworking processes is divided into the following categories; forming, cutting and joining processes. (JCMetalwork, 2017). These processes are performed by different groups of metalworkers or an individual, this special individuals working in metalwork industry might have different approach as to which they are involved in metalwork. Some might see metalwork as a profession, some as a hobby and to some entrepreneurship means that will fetch them a means of livelihood. Before this individuals could be called or referred to as professional metalwork practitioners they must undergo certain training either through formal or informal educational system.

In the ancient time skills like metalwork were learnt through mentorship and apprentice. As time went on they became a need to create a formal means of acquiring metalwork skills. In Nigeria, metalwork technology is a vocational training programme offered in technical colleges, companies and designated skill acquisition center. Metalwork technology is also a field of study in technical colleges that teaches student how to make use of metal to produce different product for daily needs. At the technical college, metalwork skills are evident in trades such as machine shop practice skills, fabrication skills, forging skills, machining skills, foundry practice skills, welding skills among others. (Oranu, Nwoke, Ogwo as cited in Emmanuel and Ariyo, 2014). Metalwork as part of courses offered in technical colleges is initiated to produce competent technical schools graduate which are called craftsmen and to help in developing them towards productivity.

The craftsmen are the least in the engineering family. They are the first and the oldest individuals from the engineering family, since they existed before the modern-day engineers. In the ancient times the craftsmen went to no school and use their brain carefully to have effect in the general public. They are known as the ancient engineers. In the advanced time today, craftsmen usually

obtain Senior Secondary School Certificates or any certificate that proves that they are trained before they are allowed to work with professional engineers. Instances of craftsmen in our general public today are the carpenters, mechanics, electrical experts, masons, plumbers, welders, and some others. Metalwork as part of courses offered in technical colleges is initiated to produce competent technical schools graduate qualified to be called craftsmen

Metalwork craftsmen are individuals who specialize in metalworking, a trade that involves creating, designing, and fabricating metal objects and structures. They have the knowledge and skills to work with metal in a variety of forms, including raw materials, semi-finished products, and finished products. Metalwork craftsmen typically use hand tools and machines to shape, join, and finish metal objects and structures. They can work in a variety of settings, such as workshops, manufacturing facilities, or as self-employed artisans. The metalwork craft encompasses a wide range of products, from everyday objects such as kitchen utensils, to large-scale structures such as bridges and buildings.

Productivity have become a central goal of technical education since its inception. The implication of this are more or less straightforward. Technical colleges are to produce more craftsmen at a lower cost, and these craftsmen should be able to quickly find jobs that matches their various field of study, (Wietse and Olga 2019). Skill is necessary for good productivity in the world of work. The main objective of technical education is to transform the students through enhancing learning skills, as a lifelong empowerment for employability.

Skill is defined as the ability to use ones knowledge effectively and readily in performing an act, or habit of doing a practical thing completely. Skills according to indeed, (2021), is a term that encompasses the knowledge, competencies and abilities to perform operational tasks. They explained that skills are developed through life experiences and they can also be learned through

study. Skills acquisition is one of the surest ways through which young people can find their ways into the labor market either in the public or private sector. The skills acquired will enable them get better jobs, be self-employed or further their education to enhance good standard of living. Advancement in technology have rendered the acquisition of only metalwork practical skills inadequate for work in metal process industry; while creating needs for new and often sophisticated skills. This is because metal products are coming with new devices as a result of technological advancement. In this era of computer, robotic and computer aided manufacturing, more than a basic understanding of the metalwork process is required. Metal industry workers need skills to use computers extensively in all types of manufacturing, product design, logistics, personal management, and especially automation of machinery in a metal industry. (Andersen, 2016). It is very important to note that the technical colleges are meant to equip their students with the skills needed to be self-employed.

Technical colleges are institutions where students are trained to acquire relevant knowledge and skills in different occupations for self-employment in the world of work (Emmanuel and Ariyo, 2014). Federal Government of Nigeria (FGN, 2013) recognized the fact that technical education would provide training and impart the necessary skills to technical college student for self-reliance economically. FGN further stated that trainees who have completed the technical college programs (craftsmen) should be able to become self-employed and possibly employ others. In order to be successfully self-employed or even employ others, the graduate must possess self-employment skills.

Self-employment skills are referred to as those skills that enable an individual to acquire and keep a job. There are numerous list of self-employment skills, among others are the communication skills which are the most prevalent of all the employability skills. This is because speaking, listening, reading, and or writing are central to all work practices, Self-management skills, skills that

contributes to employee satisfaction and growth, Problem solving skills which contribute to the employees, employer, industries growth and competitiveness in the global world, Critical thinking skills which is the intellectual process of analyzing, evaluating and synthesizing observations or assertions, practical skill which are also called hard skills or technical skills, they are skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques.

Self-employ skills are important and must be taught by the teachers and fully acquired by the students in the technical colleges but almost a total reverse is the case today. According to Ehimen and Ezeora, (2018).graduate of technical colleges who are supposed to be employers of labor are now job seekers. The society needs competent metal work craftsmen, therefore there is need to analyze the skill gap among metal work craftsmen for self-employment in Abuja.

1.2 Statement of the problem

The social and economic tension in the Nigerian scene have led many to query the relevance of the Nigerian educational system in general and technical education in particular. Technical education is a means of social mobility and a key basis by which the metalwork industry decide who get the opportunity to work. Technical Education is not just an end in itself but an investment, a means to an end. Abdulrahman, (2013) asserted that to attain great achievement of productivity and sustainable economy, environmental and natural development in this modern world, appropriate attention and optimum recognition are should be given to the promotion of technical education in Nigeria. Technical education produces the attitude, skills, knowledge and personalities upon which modern metalwork technology, metalwork industry, and modern metalwork development and productions depend. The options available to craftsmen as stated in the national policy on education among others are to secure employment, set up their own business

invariably , becoming self-employed and be able to employ others (FGN, 2014). Many individuals choose metalwork technology in technical colleges with hope of securing employment in the field and enjoying a certain level of income based on the qualification attained. The extent to which craftsmen secure employment, enjoy certain level of income based on their qualification, determines the effectiveness or ineffectiveness of the programme. The effectiveness of metalwork technology programme in technical colleges is the extent to which graduates are able to find jobs, enter in the occupation related to the field of training, earn expected income and are able to use their skills in the place of work.

The unemployment rate in Nigeria as a result of unskilled craftsmen is alarming. Chukwuma, (2015) in his study defines unemployment to include graduate of technical colleges who are capable and willing to work but could not find a job or are discriminated for lack of experience and required skill. Some school of thoughts argues that the lack of skills by graduate of metal work is caused by inadequate equipment's and facilities, while others believes that it is the management planning and utilization of the available equipment and facilities that is responsible for the low skill acquired by metalwork student.

Unfortunately, the society and metalwork industry of today have changed the job demands of employment requiring more skills especially the self-employ skills, making several craftsmen either unemployable or ill fitted for the demand of the job they get. The figurative amount of craftsmen without adequate skills for self-employment is alarming and drastic decision needs to be taken to bridge this gap for sustainable development in the country. Metalwork craftsmen are expected to acquire skills to enable them be relevant in the world of work, but in cases where they lack self-employment skills it becomes imperative to analyze the skill gap among metal work craftsmen for self-employment in Abuja.

1.3 Purpose of the study

The major purpose of this study is to determine and analyze the skill gap among metal work craftsmen for self-employment in Abuja. Specifically, the study would identify and analyze:

1. Metalwork skills needed by metalwork craftsmen in Abuja for self-employment.
2. Metalwork skills possessed by metalwork craftsmen in Abuja for self-employment.
3. The gap between the metalwork skills needed and the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment.
4. The possible training strategies for improving the skills possessed by metalwork craftsmen in Abuja

1.4 Significance of the study

The study will be of benefit to the curriculum planners, ministry of education, student, and the society.

The curriculum planners, for technical education will benefit from the findings of this study in the following ways: the findings in this study will show the gap between the skills needed and the skills possessed for self-employment by craftsmen in Abuja which will lead to recommendation that will help them to evaluate the level at which their curriculum serves its purpose thus causing an upgrade where necessary, in either curriculum content, school teaching and practical facilities or the level and qualification for staffing adequate for effective training of student in metal work trades. It will minimize wastage in the system in the sense that the recommendations as a result of the findings will lead to adoption of effective supervisory approaches by technical education

authority to enhance qualitative training. This will facilitate the achievement of the objectives of technical education.

The ministry of education will benefit from this study in several ways. Once the curriculum is reviewed to ensure that the educational goals and objectives are clearly defined and they aligned with the needs of the students and society. The ministry of education will then benefit from the study by approving the curriculum to be implemented in technical colleges. This can lead to improved teacher effectiveness and professional development by providing clear and consistent guidance for instruction and assessment. This can lead to an upgrade in the student learning outcomes and creating better prepared craftsmen for the workforce in their various places of employment.

The society will benefit from this study when craftsmen in Abuja are adequately trained, competent and skillful, they will be fit for employment in the metalwork industry in the country and even outside Nigeria. When the metalwork students are fully equipped with the adequate skills necessary they could be self-employed thus creating room for new metalwork innovations worthy of competition with international latest innovations. Each person will be able to contribute to the development activities of the society and country economy will be boosted.

1.5 Scope of the study

This study is carried out to identify and analyze the skill gap among metal work craftsmen for self-employment in Abuja. This study will not provide total solutions to bridging the gap between the skill needed and the skill possessed by craftsmen in Abuja. This study/research would only suggest possible training strategies for improving the skill possessed by craftsmen in Abuja.

1.6 Research questions

The following research question were developed to guild the study:

1. What are the metalwork skills needed by metalwork craftsmen in Abuja for self-employment.
2. What are the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment.
3. What is the gap between the metalwork skills needed and the metalwork skills possessed for self-employment by metalwork craftsmen in Abuja for self-employment.
4. What are the possible training strategies for improving the self-employment skills possessed by metalwork craftsmen in Abuja

1.7 Hypotheses

The following null hypotheses will be test at 0.05 level of significance.

1. . Ho1: There is no significant difference between the mean responses of metalwork technology teachers in the three technical colleges in Abuja and engineers in the metalwork industry, on the skills needed by metalwork craftsmen in Abuja for self-employment.

2. Ho2: There is no significant difference between the mean responses of metalwork engineers in the metalwork industry in Abuja and metalwork craftsmen in Abuja, on the skills possessed by metalwork craftsmen in Abuja for self-employment.
3. Ho4: There is no significant difference between the mean responses of metalwork technology teachers in the three technical colleges in Abuja and engineers in the metalwork industry, on the possible training strategies for improving the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Theoretical framework

2.1.1 The learning theories

The learning theory is a broad term that refers to the scientific study of how individuals, creatures or in this study case how student of technical college learn. Pierette (2019) also defined the learning theory as a set of different concepts that observe, describe, explain, and guide the learning process of people and everything that relates to this process. It incorporates an extensive variety of explored regions, like old-style molding, operant molding, mental learning, and social learning. The learning theory plans to comprehend how individuals and creatures get new information, skills, perspectives, and ways of behaving, and how they can adjust to their current circumstance. It is an interdisciplinary field that draws on psychology, neuroscience, education, and different fields to comprehend the cycles associated with learning. The significant three principal learning theories are, behaviorist, cognitivist, and constructivism.

2.1.1.1 Behaviorist Learning Theory

B.F. Skinner (1904) propounded the behaviorist learning theory, in which he expresses that learning is a course of 'molding' in an environment of improvement, reward, and punishment. Skinner (1904–1990) was a major American psychologist and Harvard professor. He makes sense

of the distinction between informal learning, which happens normally, and formal learning, which relies upon the teacher actions (reward and punishment). Consequently, the behaviorist theory depends on the conviction that learning is the result of detectable reactions to specific upgrades. It is centered on changing behavior through reward and discipline punishment. This theory recommend that people learn new ways of behaving or adjust existing ones in light of the outcomes that follow those ways of behaving.

With regards to metalwork craftsmen, in the event that he or she have mastered specific skills or ways of behaving through reward, or punishment, it then serves as reinforcement, it helps them stay motivated and engaged in their education. Additionally, behaviorist learning theory emphasizes the importance of repetition and practice in learning, which can be beneficial for metalwork craftsmen who are trying to master certain skills or concepts. It is relevant to the student with sense that the student will tend to learn better knowing that there will be reward for every learning activity they undertake. Moreover, this could also be of great use as they become self-employed individual after graduation, the outcomes of their activities, such as bringing in a profit or losing cash, may act as support or discipline for specific ways of behaving and directing their navigation and activities later on.

2.1.1.2 Cognitivist Learning Theory (CLT)

Development of the CLT is credited to Educational Psychologist Jean Piaget, and is valuable in the examination of the connection between mental cycles and factors, both interior and outside. Authored in 1936, Piaget fostered the CLT to recommend that information is something effectively developed by students in light of already educated information. This theory of learning focuses on the mental processes involved in learning. It emphasizes the internal cognitive processes that enable people to acquire, store and use knowledge.

The CLT agrees that a new knowledge can be easily understood and build if the student has acquired background or basic knowledge in the past on the line of the new knowledge to be learnt. This is especially useful as the student keeps learning new skills or concepts related to his or her field. Second, the cognitivist theory can assist the technical teachers with planning for the training and growth of the student, by understanding how students learn and what systems are best, the teachers can create seriously captivating and successful opportunities for growth.

2.1.1.3 Constructivism Learning Theory

Constructivism theory was propounded by Jean Piaget in 1972. As a scholar, he was keen on how an organic entity adjusts to the environment and how past mental information adds to ways of behaving. This theory recommends that learning happens when student build their own importance through their connections with the environment and other students as technical knowledge is best built by the students themselves, as most involves practicing to form mastery.

The constructivism learning theory states that information is built through active engagement with the environment. Brian Fairbanks (2021) defined learning as a process that brings together personal and environmental experiences and influences for acquiring, enriching or modifying one's knowledge, skills, values, attitudes, behavior and worldviews. Technical college teachers can utilize this theory to establish an interactive learning environment that urges students to investigate, seek clarification on some pressing issues, and make connections with their knowledge.

This theory is especially relevant to student of technical colleges, as it encourage students to take an active role in their learning by causing them to explore and construct meaning from their own experiences. This type of learning can help students become more independent and develop self-

reliance. Additionally, it can help students understand the importance of collaboration, as they are encouraged to explore ideas with their peers and form their own conclusions. The theory also make the student develop problem-solving skills and critical thinking, as they are encouraged to think critically and creatively about how to best approach a problem. With the use of constructivism learning theory, they effectively draw on the environment to find and fabricate a fruitful business after graduation, this includes identifying different possible business sectors, creating strategies, and creating associations with suppliers and clients. Constructivism learning theory supports a functioning, active way to deal with learning, which is fundamental for self-employed technical college graduates. By participating in problem solving and experimentation, these graduate can foster the abilities and information important to prevail in the business world. Also, this theory advances the improvement of critical thinking skills, which permit technical college graduates to distinguish and address difficulties that emerge over the course of their self-employment.

The Learning Theory provides a framework for understanding how technical college student could learn and how best to design instruction to help them acquire knowledge and skills. In it design it outlines three main components of learning: cognitive, affective, and psychomotor. It also discusses various instructional strategies that can be used to facilitate the learning process, such as scaffolding, modeling, and feedback. In addition, the theory explains how learners can develop self-efficacy, self-regulation, and motivation, which are essential for successful learning in technical college and being self-employed after the student's graduation. Generally, the Learning Theory provides a strong foundation for developing curricula and instruction that are tailored to the needs and interests of technical college students.

2.1.2 Skill acquisition Theory

The skill acquisition theory (SAT) was propounded by Dekeyser (2007). The basic claim of Skill Acquisition Theory, according to Dekeyser (2007), is that “the learning of a wide variety of skills shows a remarkable similarity in development from initial representation of knowledge through initial changes in behavior to eventual fluent, spontaneous, largely effortless, and highly skilled behavior, and that this set of phenomena can be accounted for by a set of basic principles common to acquisition of all skills”. Skill Acquisition Theory(SAT) accounts for how people progress in learning a variety of skills, from initial learning to advanced proficiency (Vanpatten & J. Williams, 2022). Skills studied incorporate both cognitive and psychomotor abilities, in areas that reach from classroom learning to applications in sports and industry. SAT, is mostly regarded as a theory for learning of new languages but Mystkowska-Wierteiak & Pawlak (2012), explains that SAT is not just a theory of development of language, rather it is a general theory of learning ranging from cognitive to psychomotor skills. Research in this space goes from quite theoretical (computational displaying of expertise procurement, the spot of abilities in a design of the brain) to quite applied (how to grouping exercises for maximal learning proficiency in different regions as, instructing professional basketball, or preparing aero plane pilots). This theory, which is based on Adaptive Control of Thought model (ACT), claims that adults commence learning something through mainly explicit processes, and, through subsequent sufficient practice and exposure, proceed to implicit processes (Vanpatten & Benati, 2010).

At the end of the day, this theory allocates roles for both explicit (express) and implicit (understood) learning. As an overall theory of learning, it guarantees that grown-ups initiate picking up something through largely explicit processes, and with ensuing adequate practice and openness, move into implicit processes. Improvement, inside this theory, involves the use of declarative knowledge (definitive information) followed by procedural knowledge, with the latter automaticity.

According to Richards & Schmidt (2010), Declarative knowledge is conscious knowledge of facts, concepts or ideas that can be stored as propositions. And procedural knowledge refers to unconscious knowledge of how an activity is done. As elaborated by Vanpatten & Benati (2010), using declarative knowledge involves explicit learning or processes; learners obtain rules explicitly and have some type of conscious awareness of those rules. The automaticity of procedural knowledge entails implicit learning or processes; learners begin to proceduralize the explicit knowledge they own, and through situational suitable practice and use, the behavior becomes second nature.

The Skill Acquisition Theory is relevant to craftsmen as it explains the process by which individuals learn new skills and improve their performance. This theory helps them understand the steps involved in learning a new technical skill, such as breaking down a task into smaller components, practicing each component until it becomes automatic, and then putting all the components together to form the complete skill. This knowledge can help craftsmen approach their technical education in a more deliberate and effective manner, leading to more successful acquisition of technical skills.

2.2 Conceptual framework

2.2.1 The Concept of Technical Colleges (TCs)

Technical colleges (TCs) are educational institutions established with the aims of training and producing technicians for industry. Okolie, U. C., Igwe, P. A., & Elom, E. N. (2019). Technical colleges in Nigeria were established in the 1950s as a result of a recommendation by the Olumide Committee, which was set up to review the education system in Nigeria and make recommendations for its improvement. Our pioneer leaders had envisaged the inevitable need for technical skills for economic growth and development, and that's why they established technical colleges across the country. It has become an integral part of the total education programme and contributes towards the development of good citizens by developing their physical, social, civic, cultural, and economic competencies (Odu 2011). Adamu (2021). Attests that technical education was seen as a way to meet the growing demand for skilled workers in the country. Technical colleges were established in various parts of the country to provide practical, hands-on training in a variety of technical and vocational fields. Many of these early technical colleges were affiliated with universities, and students who completed their studies at the technical colleges could go on to pursue further education at the university level. Today, technical colleges in Nigeria continue to play an important role in providing practical, job-oriented education to students, and are a vital part of the country's education system.

There are a wide range of trades and technical fields that are taught at technical colleges in Nigeria. According to National Board for Technical Education (NBTE) (2010), the approved trades in technical colleges include:

- Motor Vehicle Mechanics (MVM) or Automotive repair
- Carpentry & joinery (C&J)
- Electrical Installation and Maintenance Work
- Plumbing and Pipe Fitting (PPF)
- Metalwork's
- Bricks and Block Construction (BBC)
- Painting and decoration (P&D)
- Fashion design and sewing
- Business studies
- Computer studies and global system mobile (gsm) maintenance work practice
- Animal husbandry
- Catering craft
- Fisheries craft
- Leather craft
- photography
- radio, television and electronic work
- fashion design

Many technical colleges offer a wide range of programs and courses to choose from, and students can typically find a program that aligns with their interests and career goals. The technical colleges

train and produce craftsmen for the industry, they impart vital technical skills in the youths, and they help towards the goal of self-employment and job creation and in the struggle towards technological advancement and acquisition. Excellence and education network (2023) Agrees that technical colleges in Nigeria are created to prepare students for self-employment in a specific trade or technical field, and to provide them with the skills and knowledge they need to be successful in their chosen careers. From the above outlined goals, it is very clear that the essence of technical college is to serve mainly as a vehicle for achieving economic development and self-employment prosperity in a Nigeria.

2.2.2 Careers and Skills in Metalwork

A career is the advancement and moves made by an individual all through a lifetime, particularly those identified with that individual's occupations. Thus a career in metalwork involves working with various types of metal to create a wide range of products, from small metal parts and components to large structures and buildings. Metalworkers may use a variety of tools and techniques to shape and form metal, such as welding, cutting, casting, and machining. Some metalworkers may specialize in a particular type of metalwork, such as blacksmithing, while others may have a more general set of skills.

To enter a career in metalwork, you may need to complete an apprenticeship or a technical training program in metalworking which could be gotten from technical colleges. With adequate training and experience, metalworkers may be able to advance to being self-employed, to supervisory or managerial positions. The individual could work for a few diverse firms and in a few distinctive zone of metalwork over a lifetime. Metalwork careers may include:

1. Machining trade: The machining trade involves using machine tools to cut and shape metal and other materials to precise dimensions. Machinists may work in a variety of settings, including factories, machine shops, and other manufacturing facilities. They may use a variety of tools, techniques and machines such as lathes, milling machines, and grinders, to create parts and components for a wide range of products. To become a machinist, need to possess Milling, drilling, Shaping, Planning and Slotting, Grinding and turning skills and to possess these skills you may need to complete an apprenticeship or a technical training program in machining which states the usefulness of technical college. In addition to machining technical skills, machinists also need to have strong problem-solving skill and pay good attention to detail. These machining trades are:

- Production machinist: A metalwork production machinist is a worker who operates machines to produce metal products. This may include setting up and operating machines, such as lathes, milling machines, and other machine tools, to shape and form metal parts. The machinist may also be responsible for selecting and installing tooling, as well as performing routine maintenance on the machines. Metalwork production machinists typically work in factories or workshops, and may be employed in a variety of industries, including automotive, aerospace, and defense.
- Tool and die maker: A metalwork tool and die maker is a worker who specializes in the creation of tools and dies used in manufacturing processes. These tools and dies may be used to cut, shape, or form metal parts. To become a metalwork tool and die maker, an individual typically needs to complete a combination of formal education and on-the-job training. This may include completing a technical college

program in metalworking or apprenticeship (receiving on-the-job training under the supervision of an experienced tool and die maker).

The work of a metalwork tool and die maker may also involve using machine tools, such as lathes and milling machines, to create the parts needed for the tools and dies. The machinist may also be responsible for designing and drafting the tools and dies using computer-aided design (CAD) software, as well as testing and maintaining the finished products.

2. Fabricating and erecting trade: Metalwork fabricating and erecting is a trade that involves the cutting, bending, and assembling of metal parts to create structures and other products. This work may be done in a variety of settings, including factories, workshops, and construction sites. Metalwork fabricators and erectors use a variety of tools and machines to shape and form metal, including shears, brakes, presses, and welding equipment. They may also use hand tools, such as hammers and wrenches, to assemble the metal parts. In addition to fabricating and erecting metal structures, metalwork fabricators and erectors may also be responsible for installing the finished products. This may involve reading and interpreting blueprints and diagrams, as well as using cranes and other lifting equipment to move and place the metal components. To become a metalwork fabricator and erector, an individual typically need also to complete a combination of formal education through a technical college or an apprenticeship training under the supervision of an experienced fabricator and erector. Fabricating and erecting trades include the following listed below:
 - Steel erector, also known as an iron worker: A steel erector or iron worker is a worker who specializes in the construction and installation of structural steel frameworks. They are responsible for reading and interpreting blueprints and plans, as well as assembling and

installing steel beams, columns, and other structural components. Steel erectors typically work on construction sites, and may be required to lift heavy objects, work at heights, and use a variety of hand and power tools. They may also be required to use safety equipment and follow safety protocols to prevent accidents and injuries.

- **Boiler maker:** A boilermaker is a tradesperson who specializes in the fabrication, repair, and maintenance of boilers, tanks, and other large vessels and structures. Boilermakers typically work in industrial and manufacturing settings, and may be responsible for tasks such as welding, cutting, and shaping metal, as well as installing and repairing boilers and other large vessels. They may also be required to read blueprints and plans, and use a variety of hand and power tools. They may also be required to lift heavy objects, work in confined spaces, and follow safety protocols to prevent accidents and injuries.
- **Pipe fitter:** A pipefitter is a tradesperson who specializes in the installation, maintenance, and repair of piping systems and related equipment. Pipefitters typically work in industrial, commercial, and residential settings, and may be responsible for tasks such as installing and repairing pipes, fittings, and valves, as well as assembling and installing piping systems for a variety of purposes, including heating, cooling, and the distribution of water and other fluids. They may also be required to read blueprints and plans, and use a variety of hand and power tools. Pipefitters may work on a variety of projects, including the construction and repair of piping systems for buildings, factories, and other structures. They may also be required to lift heavy objects, work in confined spaces, and follow safety protocols to prevent accidents and injuries.
- **Mill wright:** A millwright is a tradesperson who specializes in the installation, maintenance, and repair of industrial machinery and equipment. Millwrights typically work

in factories, power plants, and other industrial settings, and may be responsible for tasks such as installing and aligning machinery, assembling and installing conveyor systems, and repairing and maintaining a variety of equipment. They may also be required to read blueprints and plans, and use a variety of hand and power tools. Millwrights may work on a variety of projects, including the construction and repair of industrial machinery and equipment, as well as the installation of new systems. They may also be required to lift heavy objects, work in confined spaces, and follow safety protocols to prevent accidents and injuries.

- **Blacksmith:** A blacksmith is a craftsman who specializes in the forging and shaping of metal, typically using a forge, anvil, and hammer. Blacksmiths may work in a variety of settings, including blacksmith shops, forge shops, and foundries, and may be responsible for tasks such as forging and shaping metal into a variety of objects, such as tools, weapons, and decorative items. They may also be responsible for repairing and maintaining metal objects, as well as creating custom pieces to meet specific customer needs. Blacksmiths may work with a variety of metals, including iron, steel, and aluminum, and may use a variety of hand and power tools, as well as specialized equipment such as forges and anvils.

To achieve career success, an individual will need a range of skills (soft skills) in addition to the practical Knowledge gained from one's studies to perfectly fit into the various careers and enhance good employability or self-employability.

Soft skills, also known as transferable or self-employment skills, are non-technical abilities that are important for success in any job. They are often difficult to measure and are not specific to any particular industry or occupation. In the self-employed metalwork trades, some important soft skills include:

1. Communication skills: Being able to communicate effectively with clients, suppliers, and other tradespeople is important for building and maintaining relationships, negotiating contracts, and managing projects.
2. Customer service skill: Providing excellent customer service can help you stand out in the market, build a positive reputation, and attract repeat business.
3. Time management skill: As a self-employed tradesperson, you will be responsible for managing your own time and ensuring that you complete projects on schedule.
4. Problem-solving skill: Being able to troubleshoot and solve problems that may arise during a project can help you deliver high-quality work and keep your business running smoothly.
5. Adaptability skill: Being flexible and able to adapt to different client needs and project requirements can be helpful in a self-employed role.
6. Teamwork skills: Developing strong interpersonal skills, such as the ability to work well in a team, can help you build positive relationships with clients and other tradespeople.
8. Learning Skills: Ability to acquire knowledge and skill to grow continuously,
9. Creative or critical Thinking skills: Ability to create ideas, to imagine solution
10. Decision Making Skills: ability to evaluate decision and to implement recommendation,
11. Self-Management Skill: Ability to manage time proficiently to maintain personal integrity.

Craftsmen must possess both practical skills and soft skills to be successful. Practical skills are crucial for a craftsmen to start their own business, as they provide the foundation for delivering quality work. On the other hand soft skills too are essential for self-employment as they help the

technical college graduate interact effectively with clients, manage their time and workload efficiently, and solve problems that may arise in their business.

In conclusion, possessing a strong combination of both practical and soft skills is crucial for craftsmen who wants to be self-employed. This balance of skills will allow them to deliver quality work, manage their business effectively, and build strong relationships with clients.

2.3 Review of Related Empirical studies

Ubele (2020) carried out a study where he sought to investigate the machining practice skills required by students of metal work in technical colleges for self-employment in Rivers State. One research question raised and one null hypothesis formulated guided the study. The study adopted a descriptive design. The population comprised 170 technicians and 49 technical education teachers in four NBTE accredited Government Technical Colleges in Rivers State. A structured questionnaire was used for data collection. The instrument was validated by three experts in Mechanical Technology from the, Rivers State University, Port Harcourt. The reliability index was established using Cronbach Alpha coefficient formula which yielded a reliability coefficient of 0.80 which was considered sufficient for the study. The data collected were analyzed using mean, standard deviation and z-test statistics. From the findings of the study it was revealed that all the listed items on Milling, drilling, Shaping, Planning and Slotting, Grinding and turning skills are highly required by students of metal works in technical colleges for self-employment in Rivers State. Based on the finding of study, it was recommended among other things that metalwork teachers should be sensitized on communicating the different machining skills open to students, as well as how these skills will lead to employers' workplace expectations. He also recommended that, government should encourage graduates of metalwork who have acquired machining skills to go into small scale business after graduation as this will aid in reducing unemployment in

Nigeria. The present study is related to the previous study as they both sought to investigate the machining practice skills required for self-employment they both adopted a descriptive survey research method, a structured questionnaire was used for data collection then mean and standard deviation was used to analyze the data collected. Meanwhile the area of study differ, the previous study was conducted in Rivers State while the the present study will be conducted in Abuja, the Federal Capital Territory.

Ehimen (2018) conducted a study with the objective of identifying metalwork skills needed by technical college graduates for sustainable employment in Edo and Enugu States of Nigeria. Three structured research questions were used to guide the study. The research questions were answered using means with standard deviation. A survey research design was used for the study. The population of the consisted of 80 graduates of metalwork from technical college working in industries in Edo and Enugu States. A 76 questionnaire items was the instrument used for data collection. The instrument was validated using two experts from Department of Vocational and Technology Education, Niger Delta University, Amassoma Bayelsa State. The reliability of the instrument was determined using Spearman's Rank Order correlation which yielded a coefficient of reliability of 0.91. The findings showed that technical college graduates needed skills to identify symbols, to use measuring instrument, read blue print and among others. Recommendations were made which included that metalwork machines equipment, laboratory/workshop and qualified instructors should be made available in technical colleges for sustainable employment in Edo and Enugu States of Nigeria. The similarities between the study and the current study is that the two studies are based on identifying metalwork skills needed by technical college graduate which are craftsmen, they both adopted the same method of data analysis , research design and instrument

for data analysis. While their difference that this study was carried out in Edo and Enugu States of Nigeria while the current study will be carried out in Abuja the Federal capital Territory of Nigeria.

Shola (2019) studied on the views of the professionals about the non-technical skills considered crucial as recruitment prerequisite among graduates of metalwork technology from technical and vocational institutions in Nigeria. It will also examine the possibility of integrating these skills into the curriculum. The study made use of the survey research design. One research question guided the study. The population for the study comprised metalwork technology professionals in Ogun State, Southwestern Nigeria. A 36-item questionnaire was the instrument used for data collection. The instrument was validated by experts from the University of Lagos (UNILAG). The reliability of the instrument was determined using Cronbach Alpha and the reliability index which stood at 0.79. The data collected were analyzed using mean statistic and standard deviation. The study revealed that professionals placed great importance on communication skills, problem-solving skills, teamwork skills and self-management qualities among others, as important recruitment prerequisite among graduates of metalwork technology from technical and vocational institutions in Nigeria. The study concludes with the suggestions that non-technical skills should be integrated into the curriculum particularly in the field of metalwork technology in technical colleges. Students should be familiar with the employers' recruitment criteria while they are still in schools in order to equip them with the necessary skills needed for employment. The similarities between both studies are, both studies adopted a descriptive survey research method, a structured questionnaire and mean and standard deviation to analyze the study. They both studied on the non-technical skill needed by technical school graduate or craftsmen. The difference the study and the current is that the study was carried out Ogun State, Southwestern Nigeria while the current the current study will be carried out in the Federal Capital Territory Abuja.

Okonkwo (2017) Studied and examined the entrepreneurial skills need of metal work trades students in technical colleges in North –East, Nigeria. Two specific objectives and corresponding research questions guided the study. The study employed survey research design. There was no sampling. The entire population of 161 was used. Structured questionnaire was used to gather information. The data obtained for the study were analyzed using mean and standard deviation was used to answer the research questions. The result showed that all the 40 metal works skills and 10 entrepreneurial skills (Management skills, Communication skills, Ability to plan, coordinate and organize effectively, Financial literacy, Ability to research effectively, Adaptability, Innovation and creative thinking, Ability to take responsibility and make decision, Competitive skill, Willingness to take risks) identified by the researcher were needed. He further recommended that the government should provide infrastructure needed for teaching of the skills identified. It was also recommended that curriculum planners and policy makers should include machining skills, welding and fabrication skills among others. The similarities between the two study is that they used the same research design, instrument for data collection and method of data analysis and they both focuses on soft skills. Their differences is in the area of study and the population of study.

Idibia, (2022) in his study, examined relevant foundry craft practice skills for technical college students' self-employment in covid-19 pandemic era in rivers state. Four purposes and four research questions were raised and one null hypothesis formulated which guided the study. The study adopted the descriptive survey design. The population was 239 comprised of 180 technicians and 59 teachers/instructors in six Government Technical Colleges in Rivers State. A questionnaire structured on a 4-point rating scale was used for data collection. The instrument was validated by three specialists one from School of secondary Technical Education, Federal College of Education (Technical) Omoku, and the other two from faculty of education, Rivers State University, Port

Harcourt. The reliability coefficient of .80 was obtained. The data collected from the respondents were analyzed using mean and standard deviation to answer the research questions. The findings revealed that to a high extent, practical skills in pattern making, core making, moulding process, melting, molten metal handling and treatment skills were relevant and innovative for technical college students' self-employment in covid-19 pandemic era in Rivers State. Hence, the study recommends government should promote the teaching and learning of foundry craft practice skills. The similarities between this study and the present one is that they both use a descriptive design method, data collected was analyzed using mean and standard deviation and they both focuses on self-employment, they differ as this study talks about foundry craft practice skills for technical college students' self-employment in covid-19 pandemic era while the current sturdy focuses on the metalwork skills needed by craftsmen for self-employment. Thy also differ in population of study and area of study.

2.4 Summary of reviewed related literatures

The need for metalwork craftsmen to acquire both practical and soft skills for them to be fit into the workplace cannot be over emphasized as there are a wide array of career choices opportunity available for an adequately trained metalwork craftsman. Also the need of technical education to meet the needs of graduates of the programme with regard them being self-employed should not be over looked as well. These craftsmen are expected to possess practical or technical knowledge and skill in metalwork and a good amount of soft skills to be properly self-employed. Generally, learning new skill is a difficult process but it has been stated in this study that learning new skills or trades combines cognitive, behavioral, and emotional processes. To succeed, you need motivation, concentration, practice, feedback, and adaptation.

The benefits of self-employment to craftsmen are numerous. One benefit is that it gives them total autonomy over their work and the course of their enterprise. They can also choose their own schedule and work on their own terms. Additionally, because they are not constrained by a salary or hourly wage, craftsmen who work for themselves may be able to make more money than they would as employees. However, working for yourself has its own unique set of difficulties. Being in charge of every part of the company, including marketing, sales, finances, and operations, these requires a great level of self-motivation and self-control which is where soft skills play a very vital role. For craftsmen who are prepared to put in the effort and face the hurdles, self-employment may be a gratifying and fulfilling career option. Technical colleges may equip craftsmen with the knowledge and experience necessary to succeed in self-employment, as well as the tools and assistance they need to successfully launch and run their own businesses.

CHAPTER THREE

3.0 METHODOLOGY

This chapter describes the procedure used in this study under the following sub-heading: Research design, area of the study, population and sample, instrument for data collection, validation of the instrument, administration of instrument, method of data analysis and data collection.

3.1 Research Design

This study employed a descriptive survey research method. Survey research allows you to gather large volumes of data that can be analyzed for frequencies, averages and patterns. McCombes, 2022. In the same vein McCombes, 2022 defines Survey research as a means of collecting information about a group of people by asking them questions and analyzing the results. It is a research method that gathers relatively limited data from a relatively large number of cases for the purpose of collecting information about variable rather than individuals. The design was considered suitable since information will be collected on the existing situation and opinion of respondent then it will be analyzed to reach a decision. A set of questionnaire were designed as instrument and administered in the study.

3.2 Area of the Study

The study was conducted in the three (3) technical colleges in the Federal Capital Territory (FCT), Abuja. The technical colleges are: Government Science and Technical College Kwali, Federal Science and Technical College, Orozo and Government Science and Technical College, Garki and

the metalwork industry in the FCT Abuja. The FCT is a representative sample of the metalwork industry in Nigeria thus studying the metalwork industry in the FCT can provide a snapshot of the state of the industry in Nigeria as a whole. The FCT was also chosen because easier access to resources could be gotten.

3.3 Population of study

The population for the study comprises of fifty six (56) respondents, of which thirty (30) and (20) are craftsmen and engineer respectively of the metal work industry and six (6), teachers of metalwork in the three technical collages in the FCT Abuja. The choice of metalwork teachers and engineers is based on the fact that craftsmen might not be knowledgeable about the skills they require for self-employment in the metalwork industry.

3.4 Sampling and sampling technique

A random sampling technique was adopted for the engineers in the metal work industry, where four (4) metalwork registered industries where selected with two engineers from each.

The absence of sampling for the craftsmen and teachers of the technical colleges in Abuja is as a result of the relatively small size of the population, there was no need for sampling. The population was manageable, the entire population was used to carry out the study.

3.5 Instrument for data collection

The instrument for data collection was structured questionnaire developed by the researcher for this study. The questionnaire contained fifty six (56) items organized into four (4) sections 1, 2, 3, and 4. All items are to be responded by indicating the response best perceived, using a four point rating scale.

The data collected by the researcher will be analyzed using mean, standard deviation as statistical tools. The four point scale rating employed has the following rating value:

For research questions in section two (2) and four (4):

Strongly Needed (SN) =4, Needed (N) =3, Rarely Needed (RN) =2 Not Needed (RN) = 1.

While research question in section 3:

Highly Posses (HS) =4, Posses (N) =3, Moderately Posses (MP) =2, No Possession (NP) =1

Section one (1) contains items to obtain personal information of the respondents, e.g. name of technical college, name of metalwork enterprise and instructions on how to effectively answer the questionnaire. Section two (2) consist of twenty four (24) items which finds out the skills needed for self-employment by metalwork craftsmen in Abuja. Section three (3) consist of twenty four (24) items which finds out the metalwork skills for self-employment possessed by metalwork graduate of technical colleges in Abuja. While section four (4) contains the possible training strategies needed for improving the skills possessed by metalwork craftsmen in Abuja

3.6 Validation instrument

It is important to validate the instrument for data collection so as to ensure that it measures what is design to measure. Therefore the instrument for data collection for this study was faced validated by three experts in the department of Industrial and Technology Education (ITE), Federal University of Technology, Minna Niger State. Their suggestions and contributions where incorporated in the final copy which was use for the study.

3.7 Reliability of instrument

The Cronbach Alpha coefficient was used to determine the internal consistency of the instrument. It was obtained by administering the questionnaire to teachers in APJ Science and Technical College, craftsmen and engineers of metalwork in Masaka Karu L.G.A of Nasarawa state, which is about 25km away from the study area but have similar features to the study area.

3.8 Administration of Instrument

A total of (56) questionnaires were administered to the respondents by the researcher. The researcher visited the three technical colleges, four metalwork industries and thirty (30) craftsmen in Abuja. During the visits the researcher briefed the respondents on how the questionnaire will be filled. After complete filling of the questionnaires they were collected and their responses used for analysis.

3.9 Method of Data Analysis

Data collected for this study was analyzed using mean, and standard deviation. Mean was used to test the research questions while standard deviation was used to test the hypothesis at 0.05 level of significance. The mean value of the four point scale is 2.50. The level of the mean score of 2.50 was chosen as the point to determine the acceptance level of each item. Therefore any item with a mean of 2.50 and above was considered needed and any item with a mean of 2.49 and below was considered disneeded.

CHAPTER FOUR

4.0 PRESENTATION AND DATA ANALYSIS

The chapter presented the analyzed data collected for the research. Data for this study were analyzed using the Microsoft excel computer programme. The presentation and analysis done on tables and figures were arranged according to the research questions and hypotheses formulated for the study.

4.1 Research Question 1

What are the metalwork skills needed by metalwork craftsmen in Abuja for self-employment?

Table 1

Mean of the Responses of the Respondents on the metalwork skills needed by metalwork craftsmen in Abuja for self-employment.

| S/N | ITEMS | X2 | X3 | Xt | REMARKS |
|-----|---|------|------|------|------------|
| 1. | Ability to Identify Symbols and their application | 3.13 | 3.00 | 3.06 | Needed |
| 2. | Ability to join metals | 3.38 | 2.50 | 2.94 | Needed |
| 3. | Ability to maintain workshop safety | 3.25 | 2.83 | 3.04 | Needed |
| 4. | Ability to weld with gas welding apparatus | 2.88 | 2.83 | 2.85 | Needed |
| 5. | Ability to identify types of metal | 3.12 | 2.83 | 3.14 | Needed |
| 6. | Ability to know the properties and behavior of metals | 3.00 | 2.83 | 2.97 | Needed |
| 7. | Ability to use measuring instrument and marking out tools | 3.25 | 2.83 | 3.21 | Needed |
| 8. | Ability to use drills and drilling machine | 2.88 | 3.17 | 2.60 | Needed |
| 9. | Ability to operate lathe machine | 2.75 | 2.33 | 2.38 | Not needed |
| 10. | Ability to cut and file metal into sizes or dimensions using appropriate tools. | 3.38 | 2.00 | 3.19 | Needed |
| 11. | Ability to understand basic electricity for use of all electrically powered machines and hand tools | 3.25 | 3.00 | 3.21 | Needed |

| | | | | |
|---|------|------|------|--------|
| 12. Ability to operate computer for auto card designs and operation of computer numerical machines(CNC) | 2.25 | 3.17 | 2.63 | Needed |
| 13. Ability to interpret working drawing, assembling drawing or blue print | 2.66 | 3.00 | 2.73 | Needed |
| 14. Ability to identify material needed for specific jobs | 3.13 | 2.83 | 2.98 | Needed |
| 15. Ability to perform soldering and brazing | 2.86 | 2.67 | 2.77 | Needed |
| 16. Ability to observe simple equipment maintenance practice | 3.38 | 2.17 | 2.77 | Needed |
| 17. Ability to use jig and fixtures | 2.63 | 3.00 | 2.81 | Needed |
| 18. Ability to Communicate clearly | 3.13 | 2.67 | 2.80 | Needed |
| 19. Ability to work with a team | 3.00 | 2.83 | 2.92 | Needed |
| 20. Ability to learn new or additional skills | 3.13 | 3.17 | 3.15 | Needed |
| 21. Ability to think creatively | 2.88 | 3.17 | 3.02 | Needed |
| 22. Ability to make good decisions | 3.13 | 2.83 | 2.98 | Needed |
| 23. good self-management skills | 3.00 | 3.00 | 3.00 | Needed |
| 24. Ability to identify and solve problems. | 3.00 | 3.17 | 3.08 | Needed |

Key: **X2** = Mean of metalwork engineer; **X3** = Mean of metalwork teachers; **XT** = Average of Mean of metalwork engineer and metalwork teachers, obtained by $(X1 + X2)/2$.

The result in **table 1** above revealed that item 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24 under this subheading are rated as needed with mean of 2.50 and above while item 9 under this subheading is rated as not needed with mean below 2.50. This implies that all the items listed apart from item “9”, are metalwork skills needed by metalwork craftsmen in Abuja for self-employment.

4.2 Research Question 2

What are the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment?

Table 2

Mean and Standard Deviation of the Responses of the Respondents on the metalwork skills needed by metalwork craftsmen in Abuja for self-employment

| S/N | ITEMS | X1 | X2 | Xt | REMARKS |
|-----|---|------|------|------|-----------|
| 1. | Ability to Identify Symbols and their application | 3.41 | 3.25 | 3.33 | Possessed |
| 2. | Ability to join metals | 3.59 | 3.25 | 3.41 | Possessed |

| | | | | |
|---|------|------|------|---------------|
| 3. Ability to maintain workshop safety | 3.07 | 3.13 | 3.10 | Possessed |
| 4. Ability to weld with gas welding apparatus | 3.00 | 2.63 | 2.81 | Possessed |
| 5. Ability to identify types of metal | 3.55 | 2.88 | 3.21 | Possessed |
| 6. Ability to know the properties and behaviors of metals | 3.38 | 2.88 | 3.13 | Possessed |
| 7. Ability to use measuring instrument and marking out tools | 3.52 | 3.25 | 3.38 | Possessed |
| 8. Ability to use drills and drilling machine | 3.61 | 2.88 | 3.24 | Possessed |
| 9. Ability to operate lathe machine | 2.79 | 3.00 | 2.10 | Not possessed |
| 10. Ability to cut and file metal into sizes or dimensions using appropriate tools. | 3.69 | 3.16 | 3.41 | Possessed |
| 11. Ability to understand basic electricity for use of all electrically powered machines and hand tools | 2.45 | 2.88 | 3.28 | Possessed |
| 12. Ability to operate computer for auto card designs and operation of computer numerical machines(CNC) | 2.96 | 2.25 | 2.35 | Not possessed |
| 13. Ability to interpret working drawing, assembling drawing or blue print | 3.34 | 2.50 | 2.73 | Possessed |
| 14. Ability to identify material needed for specific jobs | 2.86 | 2.88 | 3.20 | Possessed |
| 15. Ability to perform soldering and brazing. | 3.34 | 2.50 | 2.68 | Possessed |
| 16. Ability to observe simple equipment maintenance practice | 2.90 | 3.25 | 3.30 | Possessed |
| 17. Ability to use jig and fixtures | 3.11 | 2.88 | 2.89 | Possessed |
| 18. Ability to Communicate clearly | 3.11 | 3.00 | 3.05 | Possessed |
| 19. Ability to work with a team | 3.28 | 3.13 | 3.20 | Possessed |
| 20. Ability to learn new or additional skills | 3.38 | 3.13 | 3.25 | Possessed |
| 21. Ability to think creatively | 3.38 | 3.13 | 3.25 | Possessed |
| 22. Ability to make good decisions | 3.34 | 3.13 | 3.23 | Possessed |
| 23. Ability to possess good self-management skills | 3.28 | 2.88 | 3.08 | Possessed |
| 24. Ability to identify and solve problems | 3.41 | 3.00 | 3.21 | Possessed |

Key: **X1** = Mean of metalwork craftsmen; **X2** = Mean of metalwork engineer; **XT** = Average of

Mean of metalwork craftsmen and metalwork engineer, obtained by $(X1+X2)/2$.

The result in *table 2* above revealed that item 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24 under this subheading are rated as possessed with mean of 2.50 and above while item 9 and 12 under this subheading are rated as not possessed with mean below 2.50.

This implies that all the items listed apart from item “9 and 12”, are metalwork skills possessed by metalwork craftsmen in Abuja for self-employment.

4.3 Research Question 3

What are the possible training strategies needed for improving the skills possessed by metalwork craftsmen in Abuja?

Table 3

Mean and Standard Deviation of the Responses of the Respondents on the possible training strategies needed for improving the skills possessed by metalwork craftsmen in Abuja

| S/N | ITEMS | X2 | X3 | Xt | REMARKS |
|-----|--|------|------|------|---------|
| 1. | Attending workshops and classes | 3.57 | 2.83 | 3.20 | Needed |
| 2. | Consistent practice and experiment with new techniques to improve metalwork skills | 3.43 | 3.00 | 3.21 | Needed |
| 3. | Study the work of other craftsmen to see how they approach metalwork practices | 3.43 | 3.00 | 3.21 | Needed |
| 4. | Getting feedback from other craftsmen, artisans, and customers on your work | 3.43 | 3.00 | 3.21 | Needed |
| 5. | Attending workshops and seminars | 3.00 | 3.17 | 3.08 | Needed |
| 6. | Attending Online metalwork courses | 2.86 | 3.17 | 3.01 | Needed |
| 7. | Attending trade shows and conferences | 2.50 | 3.00 | 2.75 | Needed |
| 8. | Personal study and research | 2.63 | 3.33 | 2.98 | Needed |

Key: **X2** = Mean of metalwork engineer; **X3** = Mean of metalwork teachers; **XT** = Average of Mean of metalwork engineer and metalwork teachers, obtained by $(X1 + X2)/2$.

The result in *table 3* above revealed that all the items under this subheading are rated as needed with mean of 2.50 and above with none rated as not needed with mean below 2.50. This implies that all the items listed are possible training strategies needed for improving the skills possessed by metalwork craftsmen in Abuja.

4.4 Hypothesis 1

HO1: There is no significant difference between the mean responses of metalwork technology teachers in the three technical colleges in Abuja and engineers in the metalwork industry, on the skills needed by metalwork craftsmen in Abuja for self-employments.

Table 4:

Standard Deviation and T- test analysis of metalwork technology teachers in the three technical colleges in Abuja and engineers in the metalwork industry on the skills needed by metalwork craftsmen in Abuja for self-employments.

N2 = Number of metalwork engineer; N3 = Number of metalwork teachers.

S = Significant; NS = Not Significant.

N2 = 8; N3 = 6;

| S/N | ITEMS | SD2 | SD3 | T-Cal | Remark |
|-----|--|------|------|-------|--------|
| 1. | Ability to Identify Symbols and their application | 1.36 | 1.55 | 0.87 | NS |
| 2. | Ability to maintain workshop safety | 1.39 | 1.64 | 0.27 | NS |
| 3. | Ability to weld with gas welding apparatus | 1.13 | 1.47 | 0.60 | NS |
| 4. | Ability to identify types of metal | 1.36 | 1.17 | 0.95 | NS |
| 5. | Ability to know the properties and behavior of metals | 1.40 | 1.33 | 0.96 | NS |
| 6. | Ability to use measuring instrument and marking out tools | 1.39 | 1.17 | 0.81 | NS |
| 7. | Ability to use drills and drilling machine | 1.23 | 1.33 | 0.91 | NS |
| 8. | Ability to operate lathe machine | 1.16 | 0.82 | 0.37 | NS |
| 9. | Ability to join metals | 1.19 | 0.89 | 0.21 | NS |
| 10. | Ability to cut and file metal into sizes or dimensions using | 1.19 | 1.26 | 0.58 | NS |

appropriate tools.

| | | | | |
|--|------|------|------|----|
| 11. Ability to understand basic electricity for use of all electrically powered machines and hand tools | 1.39 | 0.98 | 0.90 | NS |
| 12. Ability to operate computer for auto card designs and operation of computer numerical machines (CNC) | 1.04 | 0.89 | 0.18 | NS |
| 13. Ability to interpret working drawing, assembling drawing or blue print | 1.51 | 1.17 | 0.78 | NS |
| 14. Ability to identify material needed for specific jobs | 1.13 | 1.17 | 0.65 | NS |
| 15. Ability to perform soldering and brazing | 1.21 | 1.03 | 0.77 | NS |
| 16. Ability to observe simple equipment maintenance practice | 1.19 | 1.17 | 0.08 | NS |
| 17. Ability to use jig and fixtures | 1.19 | 1.26 | 0.58 | NS |
| 18. Ability to Communicate clearly | 1.13 | 1.03 | 0.45 | NS |
| 19. Ability to work with a team | 1.07 | 1.17 | 0.79 | NS |
| 20. Ability to learn new or additional skills | 1.13 | 1.33 | 0.95 | NS |
| 21. Ability to think creatively | 1.36 | 1.33 | 0.70 | NS |
| 22. Ability to make good decisions | 1.36 | 1.17 | 0.68 | NS |
| 23. Good self-management skills | 1.20 | 0.89 | 1.00 | NS |
| 24. Ability to identify and solve problems | 1.31 | 1.17 | 0.81 | NS |

Key: N2 = Number of metalwork engineer; N3 = Number of metalwork teachers;

S = Significant; **NS** = Not Significant;

SD1 = Standard Deviation of metalwork engineer; **SD2** = Standard Deviations of metalwork teachers.

Degree of Freedom (df) = $N2 + N3 - 2$, **T critical** = ± 1.96

Df = 12

T cal. = T- test value of the metalwork technology teachers in the three technical colleges in Abuja and engineers in the metalwork industry

Table 4 above shows the data analysis of t-test on the skills needed by metalwork craftsmen in Abuja for self-employments. The calculated t-test value was less than the t-critical value for items 1-24 at 0.05 level of significance. The null hypothesis was accepted and the alternative hypothesis was rejected. It was therefore concluded that there is no significant difference in the mean response of the metalwork technology teachers

in the three technical colleges in Abuja and engineers in the metalwork industry on the skills needed by metalwork craftsmen in Abuja for self-employments

4.5 Hypothesis 2

HO2: There is no significant difference between the mean responses of metalwork craftsmen in Abuja and metalwork engineers in the metalwork industry in Abuja on the skills possessed by metalwork craftsmen in Abuja for self-employment.

Table 5:

Standard Deviation and T- test analysis of metalwork engineers in the metalwork industry in Abuja and metalwork craftsmen Abuja on the skills possessed by metalwork craftsmen in Abuja for self-employment.

N1 = 30; N2 = 8; S = Significant; NS = Not Significant

| S/N | ITEMS | SD1 | SD2 | T-Cal | Remark |
|-----|--|------|------|-------|--------|
| 1. | Ability to Identify Symbols and their application | 0.82 | 1.39 | 0.67 | NS |
| 2. | Ability to join metals. | 0.63 | 1.16 | 0.28 | NS |
| 3. | Ability to maintain workshop safety | 1.00 | 1.36 | 0.90 | NS |
| 4. | Ability to weld with gas welding apparatus | 1.10 | 0.97 | 0.38 | NS |
| 5. | Ability to identify types of metal | 0.69 | 1.25 | 0.05 | NS |
| 6. | Ability to know the properties and behavior of metals | 1.05 | 1.13 | 0.24 | NS |
| 7. | Ability to use measuring instrument and marking out tools | 0.78 | 1.39 | 0.48 | NS |
| 8. | Ability to use drills and drilling machine | 0.79 | 0.83 | 0.03 | NS |
| 9. | Ability to operate lathe machine | 1.21 | 1.00 | 0.68 | NS |
| 10. | Ability to cut and file metal into sizes or dimensions using appropriate tools. | 0.47 | 1.25 | 0.05 | NS |
| 11. | Ability to understand basic electricity for use of all electrically powered machines and hand tools | 0.76 | 1.36 | 0.03 | NS |
| 12. | Ability to operate computer for auto card designs and operation of computer numerical machines (CNC) | 1.18 | 1.03 | 0.67 | NS |
| 13. | Ability to interpret working drawing, assembling drawing or blue print | 1.14 | 1.41 | 0.34 | NS |
| 14. | Ability to identify material needed for specific jobs | 0.86 | 1.36 | 0.24 | NS |
| 15. | Ability to perform soldering and brazing | 1.11 | 1.20 | 0.47 | NS |

| | | | | |
|--|------|------|------|----|
| 16. Ability to observe simple equipment maintenance practice | 0.86 | 1.17 | 0.80 | NS |
| 17. Ability to use jig and fixtures | 1.01 | 1.25 | 0.96 | NS |
| 18. Ability to Communicate clearly | 0.91 | 1.41 | 0.80 | NS |
| 19. Ability to work with a team | 0.75 | 1.36 | 0.68 | NS |
| 20. Ability to learn new or additional skills | 0.62 | 1.13 | 0.40 | NS |
| 21. Ability to think creatively | 0.86 | 1.36 | 0.52 | NS |
| 22. Ability to make good decisions | 0.77 | 1.13 | 0.52 | NS |
| 23. Good self-management skills | 0.84 | 1.36 | 0.30 | NS |
| 24. Ability to identify and solve problems | 0.68 | 1.31 | 0.23 | NS |

Key: N1 = Number of metalwork craftsmen; N2 = Number of metalwork engineers;

S = Significant; **NS** = Not Significant;

SD1 = Standard Deviation of metalwork craftsmen; **SD2** = Standard Deviations of metalwork engineers.

Degree of Freedom (Df) = $N1 + N2 - 2 = 25$, T critical = ± 1.96

Df = 36

T cal. = T- test value of the metalwork craftsmen and metalwork engineers

Table 5 above shows the data analysis of t-test on the skills possessed by metalwork craftsmen in Abuja for self-employments. The calculated t-test value was less than the t-critical value for items 1-24 at 0.05 level of significance. The null hypothesis was accepted and the alternative hypothesis was rejected. It was therefore concluded that there will be no significant difference in the mean response of the metalwork technology craftsmen and engineers in the metalwork industry on the skills needed by metalwork craftsmen in Abuja for self-employments.

4.6 Hypothesis 3

HO3: There is no significant difference between the mean responses of metalwork technology teachers in the three technical colleges in Abuja and engineers in the metalwork industry, on the

possible training strategies for improving the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment.

Table 6: Standard Deviation and T- test analysis of engineers in the metalwork industry and metalwork technology teachers in the three technical colleges in Abuja and on the possible training strategies for improving the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment.

N2 = 8; N3 = 6; S = Significant; NS = Not Significant

| S/N | ITEMS | SD2 | SD3 | T-Cal | Remark |
|-----|---|------|------|-------|--------|
| 1. | Attending workshops and classes | 1.13 | 1.47 | 0.33 | NS |
| 2. | Consistent practice and experiment with new techniques to improve metalwork skills. | 1.13 | 1.26 | 0.53 | NS |
| 3. | Study the work of other craftsmen to see how they approach metalwork practices | 1.13 | 1.26 | 0.53 | NS |
| 4. | Getting feedback from other craftsmen, artisans, and customers on your work | 1.13 | 1.26 | 0.53 | NS |
| 5. | Attending workshops and seminars | 1.29 | 1.17 | 0.81 | NS |
| 6. | Attending online metalwork courses | 1.07 | 0.75 | 0.57 | NS |
| 7. | Attending trade shows and conferences | 1.20 | 1.10 | 0.49 | NS |
| 8. | Personal study and research | 1.51 | 1.21 | 0.36 | NS |

Key: N2 = Number of metalwork engineers; N2 = Number of metalwork engineers

S = Significant; **NS** = Not Significant;

SD1 = Standard Deviation of metalwork craftsmen; **SD2** = Standard Deviations of metalwork engineers.

Degree of Freedom (df) = N1 + N2 - 2 = 25, T critical = +-1.96

Df = 12

T cal. = T- test value of the metalwork teachers and metalwork engineers

Table 6 above shows the data analysis of t-test on the possible training strategies for improving the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment.

The calculated t-test value was less than the t-critical values for items 1-8 at 0.05 level of significance. The null hypothesis was accepted and the alternative hypothesis was rejected. It was therefore concluded that there will be no significant difference in the mean response of metalwork teachers and metalwork engineers on the possible training strategies for improving the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment.

4.7 Summary of Finding

This section of the study is intended to report the research findings based on the research questions and hypotheses formulated to guide the study.

This presentation is as found below. Research question one presented twenty four items on what are the metalwork skills needed by metalwork craftsmen in Abuja for self-employment? The analysis of the respondent's responses shows that all items listed are needed.

Research question two presented twenty four items on what are the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment? The analysis of the respondents' responses shows that all items listed are possessed by metalwork craftsmen in Abuja for self-employment except item 9 and 12.

Research question three presented eight items on the possible training strategies for improving the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment. The analysis

of the respondents' responses on the possible training strategies for improving the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment shows that all items listed in Table 6 are needed.

4.8 Discussion of Findings

The data presented in Table 1 provided answer to research question one, findings revealed that the items listed as the metalwork skills needed by metalwork craftsmen in Abuja for self-employment had a high mean score. Thus, indicating the acceptance of the respondents. In the same vein, the t-test analysis result on hypothesis one presented in table 4 confirmed that there is no difference between the mean response of metalwork engineer and metalwork teachers on the metalwork skills needed by metalwork craftsmen in Abuja for self-employment. This showed that all the items except item "9" listed will be necessary and needed by craftsmen in Abuja for self-employment.

The data presented in Table 2 provided answer to research question two, findings revealed that the items listed as the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment had a high mean score. Thus, indicating the acceptance of the respondents. In the same vein, the t-test analysis result on hypothesis two presented in table 5 confirmed that there is no difference between the mean response of metalwork engineer and metalwork craftsmen on the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment. This showed that all the items except items "9 and 12" listed are necessary and possessed by craftsmen in Abuja for self-employment.

The data presented in Table 3 provided answer to research question three, findings revealed that the items listed as the possible training strategies for improving the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment had a high mean score. Thus, indicating the acceptance of the

respondents. In the same vein, the t-test analysis result on hypothesis three presented in table 6 confirmed that there is no difference between the mean response of metalwork engineer and metalwork teachers on the possible training strategies for improving the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment. This showed that all the items listed will be necessary and needed for improving the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

The chapter covers the summary of the study, conclusion drawn from the study and recommendations.

5.1 Summary of the Study

The study examines the skill gap analysis among metal work craftsmen for self-employment in Abuja. The study is aimed at getting across to metalwork craftsmen, metalwork engineers and metalwork teachers in the technical colleges, in Abuja to find out their views on the issue raised from the topic. Our modern society is evolving into a cutting-edge, knowledge-based economy. The workers in such economies must be able and capable of lifelong learning, staying current, and familiarity with the skill requirements of the chosen vocation. Nigeria has been known for its high rate of unemployment among technical school graduates from Nigeria. A lot of employers of labor and technical disciplines have severally expressed much concern about the technical competences of metalwork craftsmen as well as the requirements of industries.

There are some skill gaps with most technical trades, among which is metalwork. The term “skills gap” describes a fundamental mismatch between the skills that employers rely upon in their employees, and the skills that job seekers possess. This mismatch makes it difficult for individuals

to find jobs and for employers to find appropriately trained workers. Elizabeth (2019). To achieve the objective of this study, three research questions and three hypothesis were formulated to serve as guide. A total of 56 respondents were involved in the research, which comprises of 30 metalwork craftsmen, 20 metalwork engineers and 6 metalwork teachers in the technical colleges, in Abuja.

5.2 Implication of the Study

The result obtained from this study has provided valuable insights into the skills gap among metalwork craftsmen for self-employment in Abuja, the implications could be far-reaching, impacting areas such as economic development, as increasing the skills of metalwork craftsmen would lead to more opportunities for self-employment and the growth of the small business sector, employment opportunities, as the identified skill gaps has helped to identify possible training strategies and potential areas for job creation. The study has highlighted the need for metalworking skills training programs, which could help to close the skill gap and provide opportunities for self-employment, the findings of the study could also inform curriculum and policy development around metalwork skill training and support for small business development in Abuja. Overall the study could have implications for the sustainability of the metalworking industry in Abuja, as identifying skill gaps could help to ensure that the industry has the skills needed to remain competitive and grow.

5.3 Contribution to Knowledge

The study would make a valuable contribution to knowledge by providing new insights and understanding about the skills gap among metalwork craftsmen for self-employment in Abuja. The

findings of the study would also inform curriculum, policy and program development aimed at improving the skills and opportunities of metalwork craftsmen in Abuja.

5.4 Conclusion

The metalwork industry expects metalwork craftsmen to have a range of technical skills, including, proficiency in using a variety of tools and equipment, such as welding torches, plasma cutters, bending machines, grinders, and drills, knowledge of various metal types and their properties, including how to cut, shape, and join them, understanding of blueprints, schematics, and technical drawings to fabricate metal components to specific specifications, familiarity with safety protocols and standards for working with metal, such as wearing appropriate protective gear and properly storing and handling equipment, attention to detail, precision, and accuracy in measuring, cutting, and shaping metal components, creativity and problem-solving skills to develop innovative solutions to design challenges, ability to work independently or as part of a team and collaborate effectively with designers, engineers, and other metalwork craftsmen, good communication skills to convey ideas and provide feedback to colleagues and customers. Overall, the metalwork industry expects metalwork craftsmen to be skilled, knowledgeable, reliable, and committed to producing high-quality work that meets the industry's standards and customer expectations. From different observation, it has been revealed that the majority of metalwork craftsmen have some deficiencies in the skills needed to carry out their required tasks. This deficiencies could be traced back to lack of knowledge of technological innovations in the metalwork technology which is as

a result of stagnation of knowledge or holding back the orthodox and old knowledge's and also the inability to embrace learning, unlearning and relearning which is in accordance to the view of Alvin (1970) in Tom (2022), who stated that, The illiterates of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn. Another factor causing this deficiencies may also be the professional skill deficiency on the part of trainers, lecturers and instructors of metalwork technology in the institutions concerned. Therefore steps should be taken in order to reverse this situation so as to prepare graduating metalwork students on what they are likely to see outside the school after graduation.

5.5 Recommendations

This calls for a concerted effort by all stakeholders to reverse this trend, which has reduced the metalwork industry to a primitive state with outdated metalwork craftsmen capabilities. The equipment for training and retraining teachers, lecturers, instructors, as well as working metalwork craftsmen, would need to be improved.

The following recommendations were made to help eradicate these issues;

1. The metalwork technology technical college's curriculum should take into account and incorporate the identified needed skills from this research work and also areas of deficiency in order to improve their training programs and bring them up to par with generally accepted modern practices in line with the trend of technological advancements in the metalwork industry. Also, the curriculum should be regularly reviewed to reflect workspace requirements.

2. To equip teachers, lecturers, and instructors with the professional and technical skills they need to satisfy the training needs of their trainees and future metalwork craftsmen, there should be progressive training and retraining in accordance with their skill deficiencies.
3. Prototypes of current metalwork equipment, tools and facilities should be made accessible for the education of students in technical colleges.
4. The metalwork industries should regularly organize training programmes, seminars and workshops for metalwork teachers on the changes or innovations in metalwork.
5. The metalwork technical institutions should ensure that the training environment is a replica of a working environment.
6. Establishing apprenticeship programs can be an effective way of providing on-the-job training and mentoring for aspiring metalwork craftsmen. Such programs could be sponsored by the government or private organizations to help build a pool of skilled artisans.
7. It is generally believed that the time after graduation from any institution of learning is a time for rest and enjoyment. On the other hand, Metalwork craftsmen should be encouraged to pursue continuing professional development to keep up with the latest trends and advancements in the industry. This can include attending conferences, workshops, and training programs that focus on new technology, techniques, and best practices.
8. Collaboration with industry experts can help provide guidance on the necessary skills and competencies required in the metalwork industry. This can involve partnerships between educational institutions and industry associations to develop relevant training programs and curriculum.

9. The metalwork industry in Nigeria requires access to modern tools and equipment to keep up with recent innovations. The government can provide support in this area by offering tax incentives and grants to encourage investment in modern machinery and equipment

5.6 Suggestion for Further Studies

Further research could be carried out in the following area:

1. The effect of the lack of information and communication technology (ICT) knowledge on the skill required by metalwork craftsmen for self-employment in Abuja.
2. The similarities and differences in skill gaps and training needs among metalwork craftsmen for self-employment in different regions of Nigeria or other countries in West Africa.
3. Evaluation of the long-term effectiveness of vocational training programs in addressing skill gaps; a longitudinal study to track changes in the skill gap among metalwork craftsmen over time in Abuja.
4. Evaluation of the economic and social impacts of addressing the skill gap among metalwork craftsmen, including the potential benefits for self-employment, job creation, and economic development in Abuja.
5. Qualitative analysis of the experiences and perception of metalwork craftsmen on their skill gap and their training needs in Abuja.

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APPENDIX B

SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION

**INDUSTRIAL AND TECHNOLOGY EDUCATION, FEDERAL UNIVERSITY OF
TECHNOLOGY MINNA.**

**QUESTIONNAIRE ON SKILL GAP ANALYSIS AMONG METAL WORK CRAFTSMEN
FOR SELF-EMPLOYMENT IN ABUJA IN ABUJA**

INSTRUCTIONS:

1. Please do not write your name on the questionnaire
2. All information you give will be treated confidentially and used only for the purpose of this study.
3. Kindly tick the response category you think is the most appropriate to each item.

The response categories are:

| | | | |
|----------------------|----------|---------------------|------|
| HN = Highly Needed = | 4 POINTS | = Highly Posses | = HP |
| N = Needed = | 3 POINTS | = Posses | =P |
| RN = Rarely Needed = | 2 POINTS | = Moderately Posses | = MP |
| NN = Not Needed = | 1 POINT | = Not Possessed | = NP |

NAME OF TECHNICAL COLLEGE, OR NAME OF METALWORK ENTERPRICE:.

RESPONDANT CATEGORY:

TEACHER

ENGINEER

CRAFTSMAN

SECTION 2

What are the metalwork skills needed by metalwork craftsmen in Abuja for self-employment?

| S/NO | ITEMS | HN | N | RN | NN |
|------|---|----|---|----|----|
| | | 4 | 3 | 2 | 1 |
| 1. | Ability to Identify Symbols and their application | | | | |
| 2. | Ability to join metals | | | | |
| 3. | Ability to maintain workshop safety | | | | |
| 4. | Ability to weld with gas welding apparatus | | | | |
| 5. | Ability to identify types of metal | | | | |
| 6. | Ability to know the properties and behavior of metals | | | | |
| 7. | Ability to use measuring instrument and marking out tools | | | | |
| 8. | Ability to use drills and drilling machine | | | | |
| 9. | Ability to operate lathe machine | | | | |
| 10. | Ability to cut and file metal into sizes or dimensions using appropriate tools. | | | | |
| 11. | Ability to understand basic electricity for use of all electrically powered machines and hand tools | | | | |
| 12. | Ability to operate computer for auto card designs and operation of computer numerical machines(CNC) | | | | |
| 13. | Ability to interpret working drawing, assembling drawing or blue print | | | | |

| | | | | | |
|-----|--|--|--|--|--|
| 14. | Ability to identify material needed for specific jobs | | | | |
| 15. | Ability to perform soldering and brazing | | | | |
| 16. | Ability to observe simple equipment maintenance practice | | | | |
| 17. | Ability to use jig and fixtures | | | | |
| 18. | Ability to Communicate clearly | | | | |
| 19. | Ability to work with a team | | | | |
| 20. | Ability to learn new or additional skills | | | | |
| 21. | Ability to think creatively | | | | |
| 22. | Ability to make good decisions | | | | |
| 23. | good self-management skills | | | | |
| 24. | Ability to identify and solve problems | | | | |

SECTION 3

What are the metalwork skills possessed by metalwork craftsmen in Abuja for self-employment?

| S/NO | | HP | P | MP | NP |
|------|---|----|---|----|----|
| | | 4 | 3 | 2 | 1 |
| 1. | Ability to Identify Symbols and their application | | | | |
| 2. | Ability to join metals | | | | |
| 3. | Ability to maintain workshop safety | | | | |
| 4. | Ability to weld with gas welding apparatus | | | | |
| 5. | Ability to identify types of metal | | | | |
| 6. | Ability to know the properties and behavior of metals | | | | |
| 7. | Ability to use measuring instrument and marking out tools | | | | |
| 8. | Ability to use drills and drilling machine | | | | |
| 9. | Ability to operate lathe machine | | | | |
| 10. | Ability to cut and file metal into sizes or dimensions using appropriate tools. | | | | |
| 11. | Ability to understand basic electricity for use of all electrically powered machines and hand tools | | | | |
| 12. | Ability to operate computer for auto card designs and operation of computer numerical machines(CNC) | | | | |

| | | | | | |
|-----|--|--|--|--|--|
| 13. | Ability to interpret working drawing, assembling drawing or blue print | | | | |
| 14. | Ability to identify material needed for specific jobs | | | | |
| 15. | Ability to perform soldering and brazing | | | | |
| 16. | Ability to observe simple equipment maintenance practice | | | | |
| 17. | Ability to use jig and fixtures | | | | |
| 18. | Ability to Communicate clearly | | | | |
| 19. | Ability to work with a team | | | | |
| 20. | Ability to learn new or additional skills | | | | |
| 21. | Ability to think creatively | | | | |
| 22. | Ability to make good decisions | | | | |
| 23. | Ability to possess good self-management skills | | | | |
| 24. | Ability to identify and solve problems | | | | |

SECTION 4

What are the possible training strategies needed for improving the skills possessed by metalwork craftsmen in Abuja?

| S/NO | | HN | N | RN | NN |
|------|---|----|---|----|----|
| 1. | Attending workshops and classes | | | | |
| 2. | Consistent practice and experiment with new techniques to improve metalwork skills. | | | | |
| 3. | Study the work of other craftsmen to see how they approach metalwork practices | | | | |
| 4. | Getting feedback from other craftsmen, artisans, and customers on your work. | | | | |
| 5. | Attending workshops and seminars | | | | |
| 6. | Attending Online metalwork courses | | | | |
| 7. | Attending trade shows and conferences | | | | |
| 8. | Personal study and research | | | | |