

# TECHNICAL AND EMPLOYABILITY SKILLS REQUIRED BY METALWORK TECHNOLOGY EDUCATION GRADUATES OF TERTIARY INSTITUTIONS IN KWARA STATE, NIGERIA

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## Abstract

The study identified the technical and employability skills required by graduates of Metalwork Technology Education from tertiary institutions in Kwara State, Nigeria. The study adopted a descriptive survey research design to elicit information from lecturers and master craftsmen in Metalwork Technology on the technical and employability skills required by Metalwork Technology Education graduates in tertiary institution in Kwara State, Nigeria. The population of the study consists of 12 lecturers in all the tertiary institutions offering Metalwork Technology Education and 56 registered master craftsmen in Metalwork Technology in the area of the study, making a total of 68 respondents for the study. The findings of the study revealed that graduates of Metalwork Technology Education from tertiary institutions in Kwara State require all the technical skills in basic machine processes and all the employability skills identified. Based on the findings, it is concluded that the acquisition of technical skills in basic machining processes and essential employability skills enhances the ability of metalwork technology education graduates to perform effectively in industry, achieve self-reliance, and contribute to organizational success. The study therefore recommended that tertiary institutions in Kwara State offering Metalwork Technology education should collaborate with Metalwork industries in order to train their students to the acquire the necessary technical skills in basic machining processes as well as employability skills for them to be employable and become self-reliant

**Keywords:** Technical Skills, Employability Skills, Metalwork Technology Education, Metalwork Technology Education Graduates, Tertiary Institutions

## Introduction

Tertiary institutions are post-secondary educational institutions. The term "tertiary" refers to the third level of education. Tertiary institutions in Nigeria includes: universities, polytechnics, monotronics and colleges of education. The Nigerian tertiary educational institutions are established with the aim of giving any student who enrolls a very sound and qualitative education, to be able to function effectively in any environment in which he/she may find him/herself; so as to become more productive, self-fulfilling and attain self actualization as outlined in the Federal Republic of Nigeria in the National Policy on Education (FRN, 2014). In realization of all these important goals, the National Policy on Education (NPE) formulated in 1977, and reviewed in 2014 has as its policy: (a) the acquisition, development and inculcation of the proper value-orientation for the survival of the individual and society; (b) the development of the intellectual capacities of individuals to understand and appreciate their environment; (c) the acquisition of both physical and intellectual skills which will enable individuals to develop into useful members of the community; and (d) the acquisition of an objective view of the local and external environments (FRN, 2014). These goals are expected to be achieved at tertiary level of education in all the states in Nigeria.

Kwara State, Nigeria has several tertiary institutions, including universities, polytechnics, and colleges of education. The tertiary institutions that are running Technical and Vocational Education and Training (TVET) Programmes includes: University of Ilorin (UIJORIN), Kwara State College of Education, Ilorin and Kwara State College of Education (Technical), Lafiagi. The TVET programmes

that are offered in tertiary institutions in Kwara States consists of Automobile Technology, Building Technology, Woodwork Technology and Metalwork Technology Education.

Metalwork technology is one of the core TVET programme offered in the tertiary institutions in Nigeria that requires a lot of skill training. Its graduates need to be trained in order to meet its immediate objectives and cope with societal changes. Metalwork technology Education graduates need to be competent in several areas such as: technical skills and employability skills. Metalwork Technology Education is the study of how to work with metals to create products. It involves learning how to use tools and machines, and developing technical and problem-solving skills. The programme of Metalwork Technology education are taught to enable the graduates of the programme to acquire i. practical skills: Students learn how to weld, forge, cast, and fabricate metal. They also learn how to measure, cut, and assemble, ii. theoretical knowledge: Students learn about metallurgy, machining operations, and safety procedures, iii. Scientific knowledge: Students learn fundamental scientific knowledge (Federal Republic of Nigeria, 2014). Bello and Kawo (2021) stated that metalwork Technology Education by its nature requires the establishment of uniformity of technical procedures, working condition of tools and equipment, work place arrangement, operations and motion sequences, consumables and nonconsumable materials, quality requirements and similar factors. Apart from all these the graduates of Metalwork Technology Education are expected to acquire technical and employability skills that will enable them to secure employment, progress and retain the job.

However, skills could be referred to as proficient capacity and competence, appropriate for a specific task, and has to do with knowledge, creativity, and expertise to the point of mastery (Ukonu & Habu, 2022). It is the set of skills, competencies, and attributes that increase an individual chance of obtaining initial worthwhile employment, maintaining and progressing in the employment, and being satisfied on the job. Technical skills are referred to as the skills, expertise or competence related to the field of the worker (Medina, 2010). Employability Skills are referred to as the skills that are required to secure and retain a job. These are skills essential skills that are necessary for acquiring, keeping and performing well on the job. Employability skills are additional traits that affect how well one operate or connect with people in a professional setting. It covers a broad range of abilities including communication, leadership, problem solving, team work, time management, interpersonal communication, decision making, critical thinking, learning, conflict resolution, confidence, positive psychology among others (Iheukwumere, 2024). When compared to technical skills such as computer skills, academic qualification, language skills, typing speed and coding, soft skills are frequently underestimated and they receive much less training. According to Ukonu and Habu (2022); Iheukwumere and Nkoro (2023) employability skills include analytical and problem-solving skills, time management, team work, communication skills, data management skills, monitoring skills, computer literacy skills among others.

Most organizations globally recognize the need to train and retrain employees with the technical skills they need to perform their jobs; while those hard/technical skills are fundamental to an employee's performance; Iheukwumere (2024) noted that employers more often have concerns about gaps in employees' employability skills. Therefore, this study examined the technical and employability skills needed by Metalwork Technology Education graduates in Tertiary Institutions in Kwara State.

### **Statement of the Problem**

One of the major challenges confronting TVET programmes in Nigeria is the perceived incompetence of many graduates, particularly those from Metalwork Technology Education. This has contributed to a decline in their performance upon entry into the workforce, as many lack the requisite technical and employability skills needed for effective job performance. Consequently, these graduates often struggle to function efficiently in industrial settings and face difficulties in establishing their own workshops, thereby limiting their capacity for self-reliance and meaningful contribution to their personal development and that of their immediate society (Muyako & Seedwell, 2015). Several studies have also indicated that employers, employees as well students often have different perceptions regarding the quality of skills needed for graduate to be employable (Muyako & Seedwell, 2015; Damoah, Pephrah & Brefo, 2021). It is against this background that this study was

designed to determine the technical and employability skills required by Metalwork Technology Education graduates of tertiary institutions in Kwara State, Nigeria.

### **Purpose of the Study**

The main purpose of the study was to identify the technical and employability skills required by Metalwork Technology Education graduates in tertiary institutions in Kwara State, Nigeria. Specifically, the study sought to identify the:

1. technical skills required by Metalwork Technology Education graduates in tertiary institutions in Kwara State.
2. employability skills required by Metalwork Technology Education graduates in tertiary institutions in Kwara State.

### **Research Questions**

The following research questions were formulated to guide in the conduct of the study:

1. What are the technical skills required by Metalwork Technology Education graduates in tertiary institutions in Kwara State, Nigeria?
2. What are the employability skills required by Metalwork Technology Education graduates in tertiary institution?

### **Methodology**

The study adopted a descriptive design to elicit information from lecturers and master craftsmen in Metalwork Technology on the technical and employability skills required by Metalwork Technology Education graduates in tertiary institution in Kwara State, Nigeria. The design was deemed appropriate since data was collected to identify areas of technical and employability skills required by Metalwork Technology Education graduates for gainful employment, self-reliance and sustainable national development. The study was conducted in all the tertiary institutions offering Metalwork Technology Education in Kwara State. The population of the study consists of 12 lecturers in all the tertiary institutions offering Metalwork Technology Education and 56 registered master craftsmen in Metalwork Technology in the area of the study, making a total of 68 respondents for the study. The choice of the population was based on the fact that they are knowledgeable and therefore, in a very good position to give authentic information on the technical and employability skills required by Metalwork Technology Education graduates for gainful employment and self-reliance.

A structured questionnaire was the instrument utilized to elicit the required data from the respondents for the study. This was developed by the researchers from extensive review of literature and based on the objectives of the research. The instrument was face validated by three experts from the Department of Industrial and Technology Education, Federal University of Technology Minna, Niger State Nigeria. To determine the reliability of the instrument, it was pilot-tested on five lecturers teaching Metalwork Technology in tertiary institutions in Niger State and 10 Metalwork Technology master craftsmen in service industries, making a total of 15 respondents for the pilot-test. Cronbach alpha statistics was used to determine the internal consistency and it yielded a reliability coefficient of 0.81. Thus, the instrument was considered appropriate for use by the researcher. The questionnaires were administered by the researchers and the entire instruments were retrieved and analysed. A five (5) point rating scale was used to determine the level at which competence is required. The decision rule was based on theory of true class limits of numbers with numerical values ranging between 4.50 – 5.49 = Very Highly Required (VHR); 3.50 – 4.49 = Highly Required (HR); 2.50 – 3.49 = Required (R); 1.50 – 2.49 = Moderately Required (MR) and 0.50 – 1.49 = Not Required (NR). Therefore, the mean responses of the respondents were interpreted based on the true class limits of numbers as highlighted.

**Results**

**Research Question 1**

What are the technical skills required by Metalwork Technology Education graduates in tertiary institutions in Kwara State, Nigeria?

**Table 1:**  
**Mean and Standard Deviation of the Respondents on the Technical Skills Required by Metalwork Technology Education Graduates of Tertiary Institutions in Kwara State, Nigeria**

S/N	Technical skills required by Metalwork Technology Education graduates	X <sub>1</sub>	S <sub>1</sub>	X <sub>2</sub>	S <sub>2</sub>	X <sub>A</sub>	S <sub>A</sub>	Remark
1	Ability to: Set the proper cutting speeds and feeds on the machine tools.	3.40	.91	3.66	.47	3.53	.69	Highly Required
2	Set up job on the lathe using digital electronic comparator.	3.70	.87	3.33	.53	3.51	.60	Highly Required
3	Perform alignment test for different machine.	3.60	.86	3.40	.73	3.50	.79	Highly Required
4	Mount steadies, jigs and fixtures on machines.	4.26	.87	3.55	.40	3.90	.68	Highly Required
5	Perform eccentric turning on the lathe.	3.70	1.09	4.30	.63	4.00	.86	Highly Required
6	Mount vertical head attachment to horizontal milling machine.	3.13	.91	3.00	.61	3.06	.76	Required
7	Machining jobs using dividing heads/indexing plates.	3.86	.96	3.77	.55	3.81	.76	Highly Required
8	Perform basic milling operations.	3.70	.77	4.20	.59	3.95	.68	Highly Required
9	Grind tapers set between centers on the universal grinder.	3.60	.95	3.38	.61	3.46	.78	Required
10	Perform grinding operation using sensitive grinding machine.	3.36	.97	3.44	.57	3.40	.77	Required
11	Use of multi-spindle drilling machine for drilling operations.	3.63	1.07	3.22	.54	3.42	.80	Required
12	Prepare flat and plane surfaces on shaping machine	3.53	.82	3.00	.66	3.26	.78	Required
13	Cutting slots with shaping machine.	2.93	.80	3.22	.52	3.70	.66	Highly Required
14	Perform machining operations using horizontal/ vertical milling machine.	3.40	.94	3.55	.60	3.47	.82	Required
15	Perform different operations on lathe Machine such as: facing, boring, knurling.	2.86	1.00	3.44	.17	3.15	.59	Required

**Key:**

- X<sub>1</sub> = Mean responses of Metalwork Technology Lecturers
- X<sub>2</sub> = Mean responses of Master Craftsmen in Metalwork Technology
- N<sub>1</sub> = Number of Metalwork Technology Lecturers
- N<sub>2</sub> = Number of Master Craftsmen in Metalwork Technology
- S<sub>1</sub> = Standard Deviation of Metalwork Technology Lecturers
- S<sub>2</sub> = Standard Deviation of Master Craftsmen in Metalwork Technology
- X<sub>A</sub> = Average Mean, S<sub>A</sub> = Average Standard Deviation

The data presented in Table 1 shows that all the 15 items mentioned as technical skills in basic

machining processes are considered required according to the opinion of the respondents. Only 8 items were identified as highly required (HR), while 7 other items were identified as required (R) with an average mean rating ranging from 3.06 to 4.00 by the respondents. Table 1 also revealed that the average standard deviation of the items ranging from 0.59 to 0.86.

## Research Question 2

What are the employability skills required by Metalwork Technology Education graduates of tertiary institution?

**Table 2:**

Mean and Standard Deviation of the Respondents on the Employability Skills Required by Metalwork Technology Education Graduates of Tertiary Institutions in Kwara State, Nigeria

S/N	Employability skills required by Metalwork Technology Education graduates	X <sub>1</sub>	S <sub>1</sub>	X <sub>2</sub>	S <sub>2</sub>	X <sub>A</sub>	S <sub>A</sub>	Remark
1	Oral communication skill: ability to clearly express one's thoughts, information and messages in speaking	3.8 0	.80	4.0 0	1.0 7	3.9 0	.87	Highly Required
2	Written communication skill: ability to express information and messages in writing	4.2 0	.78	4.6 0	.82	4.4 0	.86	Highly Required
3	Teamwork skill: ability to work Collaboratively with peers	3.4 3	.66	3.1 3	.80	3.3 8	.87	Required
4	Problem-solving skill: ability to identify and critically assess problem and devise a plan of action for its solution	3.9 3	.82	4.4 4	.94	4.1 9	1.0 9	Highly Required
5	Leadership skill: ability to influence and inspire others in ways that enhance there productivity and satisfaction	3.4 0	.59	3.4 4	1.0 0	3.4 6	.91	Required
6	Interpersonal skill: ability to interact and relate with others effectively	3.2 6	.69	3.2 2	.91	3.2 1	.96	Required
7	Computer technology skill: use computer effectively in the work place.	3.5 3	.60	3.2 2	.87	3.7 5	.77	Highly Required
8	Analytical thinking and innovation conflict management	3.1 3	.79	3.4 4	.86	3.2 9	.95	Required
9	Organization and time management	3.4 6	.68	3.0 0	.87	3.2 0	.97	Required
10	Flexibility and adaptability	3.4 6	.86	3.3 3	1.0 9	3.4 0	.91	Required
11	Critical thinking: analytical thinking and innovation	3.5 3	.76	4.2 2	.91	3.8 8	.87	Highly Required
12	Supervising the work of others	3.1 3	.76	3.1 1	.96	3.0 6	.80	Required
13	Coordinating the work of peers	3.4 3	.68	3.6 6	.77	3.5 4	.78	Highly Required
14	Coordinating the work of subordinates	3.2 6	.78	3.3 3	.95	3.2 9	.66	Required
15	Making impromptu presentations	3.5 3	.77	3.7 7	.97	3.6 5	.82	Highly Required
16	Identifying conflict among people	3.0 0	.68	3.4 0	.91	3.2 0	.59	Required
17	Empathizing with others	3.3 8	.86	3.6 2	.87	3.5 0	.69	Highly Required

The data presented in Table 2 shows that all the 17 items mentioned as employability skills were considered as required based on the opinion of the respondents. Only 8 items were identified as highly required (HR), while 9 other items were identified as required (R) with an average mean rating ranging from 3.06 to 4.40 by the respondents. Table 2 also revealed that the average standard deviation of the items ranging from 0.59 to 1.09.

### **Findings of the Study**

Based on the data collected and analyzed, the following findings emerged:

1. The respondents agreed that all 15 identified technical skills in basic machining processes are required, with 8 classified as highly required and 7 as required.
2. The respondents also agreed that out of 17 listed employability skills, 8 were highly required while the remaining 9 were considered required.

### **Discussions of the findings**

The findings from Table 1 in the area of technical skills in basic machining processes required by metalwork technology education graduates, revealed that all the 15 items listed as competencies were required by the graduates. This indicates that the Metalwork technology education graduates are expected to acquire these competencies based on the respondent's opinion. This finding is in agreement with the Ekpenyong, (2005) who maintained that technical skills are very necessary if the metalwork technology education graduates are to practice their trade and become self-reliance upon graduation. Metalwork technology graduates are expected to learn contemporary metal joining process, cutting, welding processes, as well as other machining operations used in manufacturing and fabricating industries. This can only be possible if the graduates acquire the necessary technical skills in the metalwork technology education workshops in their higher institution of learning. In support of this Bello and Kawo, (2021) observed when metalwork technology education graduates acquire the right technical skills it will enable them develop their mental and physical capabilities thereby, increasing their skills, knowledge and attitude required for utilizing the natural resources for economic development of the nation and for their own self-improvement.

It is also imperative that tertiary institutions offering metalwork technology education should work in harmony with industries and other labor organizations so that the students as well as the graduates of such institutions be retrained in the industries for them to acquire the necessary skills for them to be able to function effectively on the job. Establishing this working relationship will ensure that skills taught in schools are related to the needs of individual students as well as the labor market requirements.

The results from Table 2 in the area of employability skills required by metalwork technology education graduates, revealed that out of the 17 items listed as competencies were required by the graduates eight were highly required while nine were required by the graduates. The results supported the findings of Odusina, Dasaolu and Agbonna (2022) who found out that strong verbal and written communication skills, ability to identify and critically assess problem and devise a plan of action for its solution, use of computer effectively in the work place. Analytical thinking and innovation, coordinating the work of peers and making impromptu presentations as well as empathizing with others as the employability skills that are highly required workers. The finding is also in line with Van-Heerdan, Jelodar, Chaeynski and Ellison, (2023) and Atah, Bessong and Ititit, (2021) who asserted that employability skills are the characteristics and social skills that affect how successfully an individual can work or interact with others.

### **Conclusion**

Based on the findings of the study, it is concluded that the technical skills in basic machining processes are required by the graduates of metalwork technology education for them function effectively in the metalwork industries or be able to establish on their own

and become self-reliant. Acquisition of employability skills by the graduates in areas such as effective written and communication, problem-solving, use of computer effectively in the work place, analytical thinking and innovation, coordinating the work of peers and making impromptu presentations as well as empathizing with others can increase the productivity, job performance of graduates of metalwork technology education, and also contribute to the success of the organization.

### Recommendations

Based on the findings the following recommendations were made:

1. Tertiary institutions in Kwara State offering Metalwork Technology education should collaborate with Metalwork industries in order to train their students to the acquire the necessary technical skills in basic machining processes in order to the skills upon graduation.
2. The management of the tertiary institutions should create a very enabling learning environment by providing the necessary facilities, equipment, and materials for effective teaching and learning. Also, skill exercises should be conducted occasionally in a classroom setting for the students in order to develop their communication, problem solving, critical thinking skills.

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