Work Skill Needs of Welding and Fabrication Students of Technical Colleges in Abia State

by
[1]Samson Ikenna Nwaodo, Ph.D, [1]Joshua Onyedikachi Ike, Ph.D & [2]Chimere Iwumuo Benedict
[1]DEPARTMENT OF INDUSTRIAL TECHNICAL EDUCATION
UNIVERSITY OF NIGERIA, NSUKKA

[2]DEPARTMENT OF AGRICULTURAL EDUCATION
UNIVERSITY OF CALABAR
Correspondence:chimere.iwumuo.pg956228@unn.edu.ng

Abstract
The study determined the work skill needs of welding and fabrication students of technical colleges in Abia State. Four research questions guided the study, and four null hypotheses were tested at 0.05 level of significance. Descriptive survey research design was adopted. The population was 220 final year students of welding and fabrication from all Technical Colleges in Abia state. There was no sampling because the population of respondents was small. The instrument used for data collection was Work Skill Needs Scale (WSNS). The instrument was subjected to face and content validation by 3 experts. The reliability coefficient was 0.76. Data was analyzed using mean and standard deviation, while t-test statistics were used to test the hypotheses. The findings revealed that: (i) identified problem solving skills were needed by welding and fabrication students of technical colleges in Abia State, (ii) all the communication skills were needed by welding and fabrication students of technical colleges in Abia State, (iii) all the self- management skills were needed by welding and fabrication students of technical colleges in Abia State, (iv) identified critical thinking skills were needed by welding and fabrication students of technical colleges in Abia State. Among the recommendations is that government should setup a committee to amend TVET curriculum at the secondary level to contain instructional activities that will impact the students.
Keywords: Work skill, Welding and Fabrication, Technical College.

Introduction

Technical colleges are educational institutions that provide specialized training and education in technical and vocational fields. Technical colleges equip students with practical skills and knowledge relevant to specific trades, industries, and professions. They are post-secondary institutions that offer programs designed to prepare students for skilled occupations, often emphasizing hands-on training and practical experience" (NCES, 2019). Technical colleges play a crucial role in the education system and the economy. By offering targeted training, technical colleges help bridge the gap between education and employment, fostering economic growth and innovation. They also provide opportunities for lifelong learning and career advancement, allowing individuals to update their skills and stay competitive in the job market (Bailey & Belfield, 2019). Additionally, technical colleges in their programs, need to continuously adapt to changing industry needs and technological advancements, requiring curriculum updates and faculty development. Thus, they need to also incorporate in addition to practical skills, other skills such as work skill, as needed in the industry.Generally, Ogbuanya and Bakare(2014), assert that skill is an individual's capacity to control element of behavior, thinking and feeling within specified contexts and within a particular task domain. Every trade contains some set of activities or tasks which require work skills by individuals who perform them.

Work- skills are special abilities that help an individual to acquire saleable skills. Work-skills entail a total array of responsibilities within an activity which an individual performs for a work to be accomplished. Work skills empower employees to be productive in the world of work (Ademu, Adah, &Atsumbe,2018). Therefore, work skill needs among the unemployed craftsmen in the labour market, specifically among the welding and fabrication students of technical colleges in Abia State is what prompted this study, as these skills are found lacking among them. Recent researches have revealed that fifty percent of employers' survey globally identified workers with skills gap to be deficient in soft skills (Hurrell, 2016). Olakotan (2015) assessed employability skills possessed by prospective graduates of technical colleges in mechanical engineering craft practice in Lagos State. The study found that employability skills possessed by those technical college students are inadequate and thus could not secure them a place in work places. The general problem is that some workers lack soft skills. Soft skills may be defined as: 'non-technical and not reliant on abstract reasoning, involving interpersonal and intrapersonal abilities to facilitate mastered performance in particular social contexts' (Hurrell et al., 2013: 162). Thus, the study sought to determine the work skill needs of welding and fabrication students of technical colleges in Abia State. Work Skills according to this study includes; critical thinking skills, self- management skills, communication skills, and problem-solving skills.

The key aspects of problem-solving entail identifying issue, dissecting the problem so that it can be understood, examining all options relating to solutions, discussing ways to solve the problem, and putting the plan into action (Gemma, 2014). Problem solving skills generally involves ability to; effectively analyze and evaluate evidence, arguments, claims, and beliefs, analyze and evaluate major alternative points of view, synthesize and make connections between information and arguments, interpret information and draw conclusions based on the best analysis, reflect critically on learning experiences and processes, solve different kinds of non-familiar problems in both conventional and innovative ways, identify and ask significant questions that clarify various points of view and lead to better solutions. According to (Özdemir and Dönmez 2021), individuals with strong problem-solving skills possess the ability to think critically and systematically, evaluate information, and generate and implement solutions to complex problems. Effective problem solving allows for efficiency, productivity, being solution focused, and improved communication.

Communication skills as part of communication competence is required not only to build synergistic relationships and cooperation between superiors and subordinates (Steele & Plenty, 2015), but also to have a significant effect on performance improvement and employee commitment (Mikkelson et al., 2015). Ruben & Stewart (2014) reinforces Tubs and Moss's opinion that the ability to communicate employees is one of the keys to success in the workplace. The important role of communication skills as one of the elements of communication competence has actually been extensively studied in relation to leadership (Madlock, 2008: Westerman et al. 2015; Sager et al., 2015), employee performance (Payne, 2005; Mikkelson et al., 2015), and job satisfaction of employees within an organization (Steele & Plenty 2015). Communication is the ability to convey thoughts and idea with clarity and confidence both in written and oral forms. Effective communication is an attribute of self-management.

Self- management represents "the ability to regulate one's emotions, thoughts, and behaviors in different situations"

(Duckworth & Carlson, 2013; Claro &Locb, 2019, p. 1). This skill comprises the ability to learn new things, ability to work with others no matter their sex, age, and race, and the ability to manage one's time. Self-management is a fundamental component to leadership success in that it allows us to control our emotions when they are not reflective of what is deemed to be appropriate behaviour for a certain situation (Gemma, 2014). Effective self-management skills involve personal- attribute skills. Personal attribute skills include critical thinking.

Critical thinking skills involves ability to; identify quickly and accurately critical issues when making a decision or solving a problem, identifying a general principle that explains inter- related experiences or factual data that define the parameters of a problem, identify reasonable criteria for assessing the value or appropriateness of an action or behavior, adapt one's concepts and behavior to changing conventions and norms, apply appropriate criteria to strategies and action plans, take given premises and reason to their conclusion, create innovative solution to complex problems and analyze the interrelationships of events and ideas from several perspectives.Critical thinking skills generally are seen as very important in equipping individuals to participate in a rapidly changing democratic society and economy (Davies 2015). Although it is very important that students enter university with critical thinking skills, research has shown that not all incoming students have acquired these skills to satisfactory level (Hyytinen, Toom, &Postareff 2018; Utrianen et al.2017). Critical thinking skills are part of the work skills needed by the technical college students of welding and fabrication.

Welding and fabrication engineering craft practice at the technical colleges are offered at two levels, leading to the award of National Technical Certificate (NTC) and Advance National Technical Certificate (ANTC) for craftsmen and master craftsmen respectively (Federal Government of Nigeria (FGN, 2007). In technical colleges, students are enrolled into fabrication and welding trade from Year I for a full time 3-year course. Hence, there are Year I, II, and III fabrication and welding students at different times. Based on this study, the survey conducted focused only on the year 111 students (final year students). Students who have acquired requisite skills in fabrication and welding may be said to have acquired skills as welders and fabricators only at the craftsmen level (Adamu&Sini 2019; Olawale&Olaseni, 2019). Welders are required to make, join and repair the metal parts for a massive range of machinery, equipment and structures, while Fabricators are involved in the creation and repair of light or heavy metals (Adamu&Sini 2019; Olawale&Olaseni, 2019).Yisa and Olakotan (2017) noted that fabrication and welding is one of the trades offered in the nation's technical colleges that laid emphasis on acquisition of requisite skills for self-reliance and employment in the world of work.

Welding and fabrication involve metals and the joining actions caused by the application of heat, pressure, and with or without filter materials (American Welding Society, 2013). Metal fabrication is the creation of metal structures by cutting, bending and assembling processes. Furthermore, American Welding Society (2013) classified welding process into the following: forge welding, gas welding, metal arc welding, resistance welding and underwater welding. Others are thermit welding, induction welding. This study focused on the two most commonly practiced types of welding as observed in most of the technical collages in Nigeria which includes; gas welding and electric arc welding. Gas welding is a welding process that uses fuel gases and oxygen during welding operation. Arc welding is a method of welding that uses

an electric power supply to create an electric arc between an electrode and the base material to melt the metals at melting point. Based on this study, both the work skills (soft skills) and the practical skills (hard skills) are all needed by the technical college students to make them employable after graduation.

Statement of the Problem

Technical skills are no longer enough for workers to compete in this highly competitive global work environment. Thus, soft skills are of paramount importance, as employers seek individuals to fill their existing job openings based on the skill level for the positions. Unfortunately, recent researches have revealed that fifty percent of employers' survey globally identified workers with skills gap to be deficient in soft skills. There is a study on assessment of employability skills possessed by prospective graduates of technical colleges in mechanical engineering craft practice in Lagos State which found that employability skills possessed by technical college students are inadequate in welding and fabrication, and thus could not secure them a place in work places. The general problem is that so many workers lack soft skills most especially in welding and fabrication. It is based on this finding that the Federal Government of Nigeria (FGN), in a bid to make technical education functional, relevant and practical oriented, made entrepreneurship education a compulsory course for all technical college students. The policy aim is to ginger in the students, entrepreneurial spirit that will help curb the increasing rate of unemployment, develop in the learners the entrepreneurial capacities and mindsets that will help them on graduation to recognize and exploit business opportunities and mobilize resources for self-employment. Technical colleges in Nigeria are institutions where students are trained to acquire relevant knowledge and skills in different occupations for employment in the world of work. It was based on the findings that this study focused on determining the work skill needs of the welding and fabrication students of technical colleges in Abia State.

Purpose of the Study

The general purpose of the study was to determine the work skill needs of welding and fabrication students of technical colleges in Abia State. Specifically, the purpose of the study was to find out if welding and fabrication students have acquired the:

1. Problem solving skills in welding and fabrication.
2. Communication skills in welding and fabrication.
3. Self- management skills in welding and fabrication.
4. Critical thinking skills in welding and fabrication.

Research Questions

1. What are the problem-solving skills needed by the technical college students, in welding and fabrication?
2. What are the communication skills needed by the technical college students, in welding and fabrication?
3. What are the self- management skills needed by the technical college students, in welding and fabrication?
4. What are the critical thinking skills needed by the technical college students, in welding and fabrication?

Hypotheses

1. There is no significant difference in the mean responses of male and female students on theproblem-solving skills needed by the technical college students, in welding and fabrication.
2. There is no significant difference in the mean responses of male and female students on the communication skills needed by the technical college students, in welding and fabrication.
3. There is no significant difference in the mean responses of male and female students on self- management skills

needed by the technical college students, in welding and fabrication.

4. There is no significant difference in the mean responses of male and female students on the critical thinking skills needed by the technical college students, in welding and fabrication.

Methodology

The design of the study is a descriptive survey research design. Nworgu (2015) described survey research as studies which aim at collecting data and describing in a systematic manner the characteristics, features or facts about a given population. Hence, descriptive survey research design is suitable for this study as it solicited information from a given population of students of welding and fabrication of technical colleges in Abia State. The population of this study is 220-year 111 welding and fabrication students in the four technical colleges in Abia State. There was no sampling since the population is small and manageable by the researchers. The instrument used for data collection was work skill need scale(WSNS) which was adapted from Obriskan (2019). The instrument is made up of two sections A and B. Part A contains Bio Data of respondents while Part B was a forty-three item statementson problem solving skills, communication skills, self-management skills, and critical thinking skills drafted to elicit information from the population. A four-scale response of strongly Agree-4, Agree-3, Disagree-2, and Strongly Disagree-1 was used. The instrument was validated by three lecturers from Automobile /Metalwork unit of theIndustrial Technical Education Department, University of Nigeria, Nsukka. The reliability of the instrument was determined the reliability was tested using Cronbach Alph, and the reliability coefficient valueof 0.76 was obtained. Data collected were analyzed using mean to answer the research questions while independent-sample t-test was used in testing the hypotheses at 0.05 level of significance for answering the research questions A mean of2.5 and above means Agree while a mean less than 2.5 means Disagree.The null hypotheses were upheld when the calculated probability value is equal or greater than 0.05 but when the calculated probability value is less than 0.05, the null hypotheses was not upheld.

Results

The results were presented in tables in line with research questions and hypothese.

Table 1: Mean Ratings on Problem Solving Skills needed by the technical college students in welding and fabrication

S/N	Items	X	SA	Remark
1	Ability to identify problems and their causes for effective productivity in welding and fabrication shop.	3.50	1.09	Agree
2	Ability to adopt the best solution while solving a problem	3.37	1.04	Agree
3	Ability to contribute positively to group problem solving issues	3.42	1.26	Agree
4	Ability to make wise decisions within a limited time while tackling a problem	3.42	1.35	Agree
5	Ability to adapt to new work situation as it arises	3.31	1.27	Agree
6	Ability to envisage an expending danger and develop a strategic approach to avoid it	3.44	1.25	Agree
7	Ability to translate ideas into action for effective productivity in the workshop.	3.21	1.16	Agree
8	Ability to initiate innovative ideas in solving problems.	2.82	1.23	Agree
9	Ability to think critically and creatively while carrying out tasks.	3.57	1.08	Agree

Table 1 indicates the mean scores ranging between 2.82- 3.56 which is above 2.50. It means that the respondents agreed that the nine items are problem solving skills

needed by welding and fabrication students in technical colleges in Abia State. The standard deviation which ranges from 1.04- 1.35 shows that the respondents are not far apart in their responses.

Table 2: Mean rating on Communication skills needed by the technical college students in welding and fabrication

S/N	Items	X	SA	Remark
1	Ability to exhibit good interpersonal relations among class members	2.90	1.03	Agree
2	Ability to exhibit good personality for efficient participation in the workshop	3.17	1.15	Agree
3	Being able to participate efficiently in expressing and presenting ideas for positive and effective outcome	2.50	0.95	Agree
4	Able to exhibit clear understanding of a task before carrying out the task	3.20	1.22	Agree
5	Ability to communicate well	2.82	0.99	Agree
6	Ability to convey thoughts and idea with clarity and confidence both in written or oral forms.	2.96	1.01	Agree
7	Ability to listen actively or attentively to instructions.	3.10	1.14	Agree
8	Ability to speak effectively to individual or groups without aggression.	3.13	1.24	Agree
9	Ability to use media formats to present ideas imaginatively.	2.99	1.09	Agree
10	Ability to express one's needs, wants, opinions and preferences without offending others.	3.27	1.31	Agree

The analysis of data as shown in Table 2 shows that the students have mean scores that range from 2.28 to 3.27 with standard deviation that range from 0.90 -1.42. It means that the mean values are greater than 2.5 in the ten items hence, the respondents agreed that the ten items are communication skills needed by the technical college students in welding and fabrication. The standard deviation which ranges from 0.90- 1.42 also shows that the respondents are close to one another in their responses.

Table 3: Mean Ratings on Self-Management Skills needed by the technical college students in welding and fabrication

S/N	Items	X	SD	Remark
1	Ability to manage time and priorities in coordinating task within the time limit	3.26	0.91	Agree
2	Being able to subject to new knowledge within/outside the welding and fabrication trade	3.06	1.14	Agree
3	Being able to take responsibility of the assigned task for optimum performance	2.80	1.01	Agree
4	Ability to articulate and translate ideas into practical	3.04	1.11	Agree
5	Ability to work with any team without being biased	3.91	0.96	Agree
6	Ability to make use of the available resources	3.15	1.16	Agree
7	Being able to exhibit balanced attitude to work and home life.	2.09	1.06	Disagree
8	Being adaptive to new ideas and techniques for effectiveness	3.17	1.20	Agree
9	Being responsive to innovations in welding and fabrication	3.07	1.16	Agree
10	Being able to invest time and effort in learning new skills	3.39	1.02	Agree
11	Being able to adapt to different situation at work.	3.12	1.21	Agree
12	Being flexible to ever changing work environment.	3.28	0.91	Agree
13	Ability to manage time allocated to deliver a given task.	3.10	1.14	Agree

The analysis in Table 3 shows that item 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13 have their mean values more than 2.50 meaning that the respondents agreed on 12 items as self –management skills while item 7 which has a mean value less than 2.50 indicating that the respondents disagreed that item 7 is a self- management skill needed by technical college students in welding and fabrication. The standard deviation which ranges from 0.90- 1.42 shows that they are close to one another in their responses.

Table 4: Mean rating on Critical Thinking Skills needed by the technical college students in welding and fabrication

S/N	Items	X	SD	Remark
1	Ability to initiate innovative ideas in welding and fabrication work	3.73	1.21	Agree
2	Ability to organize welding and fabrication task effectively for maximum productivity	3.57	1.16	Agree
3	Ability to interpret working drawings	2.57	1.30	Agree
4	Ability to make working drawing of a project	3.30	1.19	Agree
5	Ability to think critically while doing metal construction work	3.55	1.25	Agree
6	Ability to conceptualize creative ideas	3.44	1.16	Agree
7	Ability to convert creative idea to product production	3.36	1.26	Agree
8	Ability to make sound decisions while caring out tasks	3.55	1.21	Agree
9	Able to predict future trends and work patterns in construction	3.98	1.28	Agree
10	Ability to assess client's needs in metal construction work	3.72	1.36	Agree
11	Ability to evaluate alternatives, and adopt the best	3.73	1.29	Agree

In Table 4, the result shows that the students have mean scores that range from 2.57 - 3.98 which is above 2.5 meaning that they agreed that the eleven items are critical thinking skills needed by technical college students in welding and fabrication. The standard deviation ranges from 1.16- 1.47 showing that their responses are close and not far apart. **Hypotheses**

Table 5: Summary of t-test analysis on responses of male and female technical college students on the problem-solving skills

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
WORK SKILLNEED.	Equal variances assumed.	9.087	.003	.464	218	.643	.33264	.71630	-1.07911	1.74439
	Equal variances not assumed.			.473	216.966	.637	.33264	.70286	-1.05267	1.71795

In Table 5, an independent sample t-test was conducted to compare the mean response scores for male and femalestudents on the problem-solving skills. The result shows no significant difference in the mean responses of male and female students (218) =.464, P = 0.643. The null hypothesis was therefore not rejected. Thus, there is no significant difference in the mean responses of male and female students on theproblem-solving skills needed by technical college students in welding and fabrication.

Table 6: Summary of t-test analysis on responses of male and femaletechnical college students on communication skills

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
WORK SKILL NEED.	Equal variances assumed.	9.816	.002	.521	218	.603	.35502	.68146	-.98808	1.69812
	Equal variances not assumed.			.532	215.616	.595	.35502	.66677	-.95921	1.66925

Table 6 shows the analysis conducted with an independent sample t-test to compare the mean response scores for male and female students on the communication skills. From the result, there is no significant difference in the mean responses of male and femalestudentst(218) =.521, P = 0.603. The null hypothesis was not rejected. Therefore, there is no significant difference in the mean response of male and female students on the communication skills needed by technical college students in welding and fabrication.

Table 7: Summary of t-test analysis on **responses of male and female technical college students on self- management skills**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
WORK SKILL NEED.	Equal variances assumed.	5.976	.015	.427	218	.670	.27873	.65218	-1.00666	1.56411
	Equal variances not assumed.			.435	217.132	.664	.27873	.64024	-.98316	1.54061

In Table 7, an independent sample t-test was used to conduct a test to compare the mean response scores for male technical college students on self- management skills. The result shows that there is no significant difference in the mean responses of male and female students t(218) =.427, P = 0.670. Therefore, the null hypothesis was not rejected. Thus, there is no significant difference in the mean responses of male and female students on self- management skills needed by the technical college students, in welding and fabrication?

Table 8: mean responses of male and female technical college students on the critical thinking skills needed by the technical college students, in welding and fabrication

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
WORK SKILL NEED.	Equal variances assumed.	2.454	.119	.308	218	.758	.18629	.60474	-1.00559	1.37817
	Equal variances not assumed.			.312	217.981	.755	.18629	.59712	-.99058	1.36316

Table 8 shows an analysis conducted using an independent sample t-test on the mean response scores for male and female technical college students on critical thinking skills. The result indicates that there is no significant difference in the mean responses of male and femalestudentst(218) =.308, P = 0.758. As result, the null hypothesis was not rejected. Therefore, there is no significant difference inthe mean responses of male and female students on the critical thinking skills needed by the technical college students, in welding and fabrication.

Discussion

The findings in Table 1 shows that ability to identify problem and their causes for effective productivity in welding and fabrication shop, ability to adopt the best solution while solving a problem, ability to contribute positively to group problem solving issues, ability to make wise decisions within a limited time while tackling a problem, ability to adapt to new work situation as it arises, ability to envisage an expending danger and develop a strategic approach to avoid it, ability to translate ideas into action for effective productivity in the workshop, ability to initiate innovative ideas in solving problems, ability to think critically and creatively while carrying out tasks are all problem solving skills in welding and fabrication. The finding is in agreement with Ozedmir&Donmezi (2021) who in their study maintained that individual with strong problem-solving skills possess the ability to think critically and systematically, evaluate information, and generate and implement solutions to complex problems. The findings are also in consonance with the findings of Gemma (2014) who in his study states that problem solving entail identifying issue, dissecting the problem so that it can be understood, examining all options relating to solutions, discussing ways to solve the problem, and putting the plan into action.

In addition, hypothesis1in table 5 reveals that the calculated probability value of 0.643 is higher than 0.05 which is the level of significance. Therefore, the null hypotheses were upheld, thus there is no significant difference in the mean responses of male and female students on the problem-solving skills needed by the students in welding and fabrication.

The findings in Table 2 reveals that ability to exhibit good interpersonal relations among class members, ability to exhibit good personality for efficient participation in the workshop, being able to participate efficiently in expressing and presenting ideas for positive and effective outcome, able to exhibit clear understanding of a task before carrying out the task, ability to communicate well, ability to convey thoughts and idea with clarity and confidence both in written or oral forms, ability to listen actively or attentively to instruction, ability to speak effectively to

individual or groups without aggression, ability to use media formats to present ideas imaginatively, and ability to express one's needs, wants, opinions and preferences without offending others are all communication skills needed by technical college students in welding and fabrication. The findingsis in line with Steele & Plenty (2015) who in their study states that communication skills as part of communication competence is required to build synergistic relationships and cooperation between superiors and subordinates. The findings of the studyisalso in agreement with Mikkelsonet al., 2015 who asserts that communication skills have significant effects on performance improvement and employee commitment. The findings of the present studyalso align with Ruben & Stewart (2014) who in their study reinforces Tubs and Moss's opinion that the ability to communicate employees is one of the keys to success in the workplace.

In addition, hypothesis 2 in table 6 shows that the calculated probability value of 0.603 is higher than 0.05. which is the level of significance. Therefore, the null hypotheses were upheld, thus there is no significant difference in the mean responses of male and female students on the communication skills needed in welding and fabrication.

The findings in Table 3 indicates thatability to manage time and priorities in coordinating task within the time limit, being able to subject to new knowledge within/outside the welding and fabrication trade, being able to take responsibility of the assigned task for optimum performance, ability to articulate and translate ideas into practical, ability to work with any team without being biased, ability to make use of the available resources, being able to exhibit balanced attitude to work and home life, being adaptive to new ideas and techniques for effectiveness, being responsive to innovations in welding and fabrication, being able to invest time and effort in learning new skills, being able to adapt to different situation at work, being flexible to ever changing work environment, and ability to manage time allocated to deliver a given task are all self-management skills needed by technical college students in welding and fabrication. The findings are supported by Gemma (2014) who opined that self-management is a fundamental component to leadership success in that it allows us to control our emotions when they are not reflective of what is deemed to be appropriate behaviour for a certain situation. The findings of the study are also in line with Duckworth & Carlson, 2013; Claro &Locb, 2019 who in their study states that self-management represents "the ability to regulate one's emotions, thoughts, and behaviors in different situations.

In addition, hypothesis 3 in table 7 shows that the calculated probability value of 0.670 is higher than 0.05 which is the level of significance. Therefore, the null hypotheses were upheld, thus there is no significant difference in the mean responses of male and female students on the self- management skills needed in welding and fabrication.

The findings in Table 4 indicates that ability to initiate innovative ideas in welding and fabrication work, ability to organize welding and fabrication task effectively for maximum productivity, ability to interpret working drawings, ability to make working drawing of a project, ability to think critically while doing metal construction work, ability to conceptualize creative ideas, ability to convert creative idea to product production, ability to make sound decisions while caring out tasks, able to predict future trends and work patterns in construction, ability to assess client's needs in metal construction work, and ability to evaluate alternatives, and adopt the best are all critical thinking skills needed by technical college students in welding and fabrication. The present study is also supported by Davies (2015) who sees critical thinking skills as very

important in equipping individuals to participate in a rapidly changing democratic society and economy. The findings are in consonance with Hyytinen, Toom, &Postareff 2018; Utrianen et al.2017 who in their study assert that it is very important that students enter university with critical thinking skills. They also maintained that research has shown that not all incoming students have acquired these skills to satisfactory level.

In addition, hypothesis 4 in table 8 shows that the calculated probability value of 0.758 is higher than 0.05 which is the significance level. Therefore, the null hypotheses were not rejected, thus there is no significant difference in the mean responses of male and female students on the critical thinking skills needed by technical college students in welding and fabrication.

Conclusion

Based on the findings, the study concluded thus; technical college students need problem solving skills, communication skills, self- management skills, and critical thinking skills in welding and fabrication. The findings of the study, if addressed in our TVET programs will help solve the problem of lack of employability skills among TVET graduates. Gender does not influence themean responses of male and female students on the work skill needs as contained in questionnaire administered to them.

Recommendation

From the findings of this study, the following recommendations were made:

1. Technical teachers should inculcate in technical college students'problem-solving skills, critical thinking skills, self-management skills, and communication skills needed in welding and fabrication.
2. The government, through the ministry of education should from time-to-time review TVET curriculum to address the ever-changing industry needs and technological advancements in our society.
3. Government should amend TVET curriculum at the secondary level to contain instructional activities that will expose the students to these recommended work skills to make them employable after graduation.

REFERENCES

Adamu, G. G. & Sini, L. K. (2019). Welding skills assessment instrument for Nigeria certificate in education in colleges of education in Nigeria. *International Journal of Educational Research and Development, 1*(2), 13-20.

Ademu, A., Adah, O. & Atsumbe, J. (2018) Approaches for enhancing graduates of Agriculturaleducation work skills towards social and economic transformation in Nigeria. *Journal of Poverty, Investment and Development,* 45(1), 26-31.

American Welding Society (2013.). Advancing the Science, Technology, and Application of Welding and Allied Joining and Cutting processes Worldwide. Retrieved May 23, 2024 From https://www.google.com/

Bailey, T., & Belfield, C. R. (2019). The impact of occupational credentials on low-income adults: Evaluating the returns of education and training in the National Longitudinal Survey of Youth 1997. *Educational Evaluation and Policy Analysis*, 41(2), 110-132.

Davies, M. 2015. "A Model of Critical Thinking in Higher Education" *In Higher Education: Handbook of Theory and Research,* edited by M.B. Paulsen, 41- 92. Dordrecht, the Netherlands: Springer International Publishing.

Duckworth, A.I., Carlson, S.M. (2013). Self-management and school success. In B.W. Sokol, F.M.E. Grouzet, & U.

Muller (Eds.), *Self- Regulation and Autonomy: Social and Developmental Dimension of Human Conduct.* Cambridge University Press.

Federal Government of Nigeria. (2007). *Standards and criteria for institutional and programme accreditation in technical colleges and similar technical institutes in Nigeria*. NBTE.

Gemma, W. (2014). *List of Interpersonal Skills:* 10 must have attributes. Retrieved from https:// blog. Udemy. Com/ list-of-interpersonal-skills/.

Hurrell SA, Scholarios D and Thompson P (2013) More than a 'Humpty Dumpty' term? Strengthening the conceptualization of soft skills. *Economic and Industrial Democracy,* 34(1): 158-179.

Hyytinen, H., A. Toom, & L. Postarett.2018 "Unraveling the Complex Relationship in Critical Thinking, Approaches to Learning and Self-efficacy Beliefs among First-year Education Science Students" *Learning and Individual Differences* 67: 132- 142. Doi: 10.1016/j.lindif. 2018.08.004.

Mikkelson AC, York JA, Arritola J. (2015). Communication competence, leadership behaviors, and employee outcomes in supervisor-employee relationships. *Business and Professional Communication Quarterly*. 78(3): 336– 354.

NCES (2019). Digest of Education Statistics. *National Center for Education Statistics*, U.S. Department of Education.

Ogbuanya, T. C. & Bakari, J. (2014). Mechatronic Skills Required for Integration into Electronic Engineering Technology Programme in Polytechnics for Sustainable Employment of Graduates in Contemporary Nigeria. Nigeria Vocational Association, 19(1), 190-197.

Olakotan, O. O. (2015). *Assessment of employability skills possessed by prospective graduates of mechanical engineering craft practice in technical colleges in Lagos State*. (Unpublished M.Ed Thesis). University of Benin, Benin City.

Paolini, A.C. (2015) School counselor's role in facilitating the development of students of the skills: Intrapersonal and interpersonal attributes to promote career readiness. *Global Journal of* Human-social science, Linguistics &Education*,*15(10).

Ruben BD, Stewart LP. (2014). *Komunikasi dan PerilakuManusia*. Ibnu Ahmad, penerjemah. Jakarta: Rajawali Pers.

Samuel, O. E. (2017). Skills Required by Farmers in Cocoa Production for Sustainable Living and Industrial Development. Journal of Nigerian Association of Teachers of Technology, 12 (1), 157-164.

Sharifah, N.R., Hanipah, H. & Shahbodin, F. (2014). 21st Century core soft skills. Research Focus for Integrated Online Project Based Collaborative Learning Model. *Journal of Applied Science & Agriculture,* 9(11), 63-68.

Steele GA, Plenty D. (2015). Supervisor–subordinate communication competence and job and communication satisfaction. *International Journal of Business Communication.* 52(3): 294–318.

Yisa, M. A., & Olakotan, O. O. (2017). Facilities for effective skill acquisition in welding and fabrication engineering craft practice. *Journal of Industrial Education and Training JIET, 4*(1), 22-28.