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Brick lock laying and Concreting Skills: A Road Map for Mitigating Youths' Migration from Nigeria

ABSTRACT

The study aimed at assessing brick and block laying and concreting skills; a road map for mitigating vouths' migration from Nigeria. Specifically, three objectives, research questions and hypotheses guided the study. This study adopted a descriptive survey research design. The population of the study was 48 respondents, comprising 30 brick/block laying and concreting Teachers and 18 Instructors in the four Government Technical Colleges in Rivers State. The study was a census as the entire population was studied. The instrument for data collection was a structured questionnaire titled "Brick/Block Laying and Concreting Questionnaire (BBLCQ)". The instrument was structured on five point likert type rating scale of Very High Extent (VHE), High Extent (HE), Undecided (UD), Low Extent (LE) and Very Low Extent (VLE). A corresponding numerical value of 5, 4,3,2 and 1 was assigned to the response scale for each item as represented below with real limits. The instrument was subjected to facevalidation by three experts. The internal consistency of the instrument was 0.82, was obtained as reliability coefficient of the instrument. The findings of the study showed that the respondents agreed to a high extent that brick laying skills; a road map for mitigating youths' migration from Nigeria. The findings of the study showed that the respondents agreed to a high extent is block laying skills; a road map for mitigating youths' migration from Nigeria. Based on the findings of the study, the following recommendations were outlined: Building Industries should organize workshop for their craftsmen on the areas where skills improvement are needed to mitigate youth migration from Nigeria. Training should be organized by the management of the construction firms and should accord priority attention to the modern skills of construction which in-turn ensure a constant supply of competent craftsmen for the construction industry.

Keywords: Brick/block Laying and Concreting Skills, Youths and Migration.

I. Introduction

The contributions of technical and vocational education in any country in the world today is enormous, hence it plays a very significant role on the national welfare. Technical and Vocational Education (TVE) is described as the training of individuals for the implementation of technological development of a nation by providing the citizens with the right skills necessary for employment (Ahamadu, 2013). The programme enlisted among others ranging from welding and fabrication, mechanical/automobile technology, electrical/electronic technology, woodwork and brick/block laying and concreting etc. These programme are offered in technical colleges.

Technical colleges are regarded as one of the principal Technical Vocational Education and Training (TVET) institution in Nigeria for the training of craftsmen. Odu (2019), stated that technical college Instructors are Instructors who are acquiring skills in Technical College Education programme in a particular occupation, trade or craft. Block/brick laying and concreting is among the trades

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offered in technical colleges in Rivers State, Nigeria.

Brick/block laying and concreting is aimed at producing skilled and self-reliant craftsmen that can execute and coordinate block-laying and concreting work in a construction project. Brick/Blocklaying and Concreting (B/BC) is one of the trades at the National Technical Certificate (NTC) level and its curriculum primarily is aimed at equipping an individual with skill on the application of the right or appropriate blocks, tools and concrete as applicable in the construction industry (National Board for Technical Education, 2013).

Bricks are often made of clay. They can undergo shape changes during manufacture, particularly in the firing process, and individual units can vary considerably in size. Tolerances are measured by placing 20 units together, which measures the average size, but not the variation of individual units. Bricks are usually solid or cored and generally made to a traditional size, 230 mm long, 110 mm wide and 76 mm high. Blocks are generally made of concrete. For the fact that they are formed in steel moulds and the material used, it is relatively stable, the size of individual units can be controlled to within small tolerances. The Block most commonly used is hollow and is often referred to by its nominal size i.e., 400 mm long, 200 mm wide and 200 mm high. Because an allowance is made for 10 mm wide mortar joints, the actual size of the block is 390 mm x 190 mm x 190 mm. To avoid the need for cutting, 3 /4, 1 /2 and 1 /4 length blocks are made which are called specials (National Board for Technical Education, 2020). Other specials are made to form lintels, control joints etc. The range of blocks with a Nominal width of 200 mm is referred to as the 200 mm Series. Less commonly used blocks are the 100 mm, 120 mm, 150 mm and 300 mm series. Some blocks in the 100 mm series are solid.

The aims of concreting is to provide the trainee with the basic knowledge of the properties and application of concrete as well as the skill in the production of sound concrete structures, apply the functions and methods of care of common concreting tools and equipment, use the application of stones in construction, Relate the properties of concrete to its application as a construction material, use and apply earth soil and laterite in construction, apply the principles and methods of proportioning, mixing and testing concrete and be able to carry out the operations. Yalams, (2020) explained the following to be the aims of concreting; to teach the trainee to know the principles and methods of handling, placing and curing concrete, Understand the principles and methods of constructing joints in concrete structures, Understand the use of form-work in construction and the principles of construction, Understand the basic principles and methods of structural detailing, Produce sound reinforced and mass concrete structures to specification and Understand the basic principles of production and use of pre-stressed concrete in the construction industry. Acquisition and application of the above skilled programme could mitigate youths' migration from Nigeria.

The youths or young people make up about a quarter of migrants worldwide. Those involved in migration are in the age bracket of 15-29 years with a mean age of 22 years. Nigeria witnessed the initial exit of her strong and young minds to other places like big towns within the country and foreign lands for better living in the 1980s and 1990s, and this has remained constant. Migration has gross positive and negative effects on every facet of national growth and development - politics, economy, value system, social- communication, trade, agriculture, religion, science and technology among others. Today Nigerian youth migrants are counted in millions and billions (Carling, & Schewel, 2017). Crawley, Duvell, Jones, McMahon and Sigona (2017) indicated that there were 244 million international migrants in 2015, with 20 million refugees in different countries. Détang-Dessendre, Drapier and Jayet (2013) observed that as many as 740 million people migrated to different countries, and among these young people are in the majority. Dibeh, Fakih and Marrouch (2018) observed that over one million Nigerians are living abroad.

II. Statement of the Problem

The goals of technical vocational education and training shall be to provide trained manpower in applied sciences, technology and business particularly at the craft, advanced craft and technical levels. Provide the technical knowledge and vocational skills necessary for Agricultural, Commercial and Economic development, acquire technical and vocational skills. Give training and impart the necessary skills to the individual who shall be self-reliant economically. Hence, these objectives listed are drives by the formal vocational institutions in Nigeria such as polytechnics, mono technics and technical colleges (National Board for Technical Education, 2013).

However, lack of employable skills and miss match between job seekers and demands of employers gave rise to Youth unemployment in Nigeria. In addition, all the youth programme and institutions lack critical resources that can be devoted to supporting youth livelihoods. For example, the National Directorate of Employment (NDE) that is supposed to train young people for skills acquisition is grossly under-resourced and just struggling to survive. So also are schemes like the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN), National Open Apprenticeship Scheme (NOAS), and National Poverty Eradication Programme (NAPEP). These failed programmes among others gave rise to youths' migration from Nigeria. The consequences of youth migration in Nigeria are that such becomes "brain drain and brain gain" culture. The country of origin is deprived of sustainable economy, manpower and skilled labour force needed for continued national development and growth. The above gave rise to assess the impact of brick and block lock laying and concreting skills; a road map for mitigating youths' migration from Nigeria.

Aim/Objectives

The aim of the study was to assess brick and block lying and concreting skills; a road map for mitigating youths' migration from Nigeria. Specifically, the study sought the extent of:

Brick laying skills; a road map for mitigating youths' migration from Nigeria.

Block lock laying skills; a road map for mitigating youths' migration from Nigeria.

Concreting skills; a road map for mitigating youths' migration from Nigeria.

Research Questions

The following research questions were formulated to guide the study:

To what extent is brick laying skills; a road map for mitigating youths' migration from Nigeria?

To what extent is block lock laying skills; a road map for mitigating youths' migration from Nigeria?

To what extent is concreting skills; a road map for mitigating youths' migration from Nigeria?

Hypotheses

The hypotheses were formulated and tested at .05 level of significance:

HO1 There is no significant difference between the responses of teachers and instructors on the extent to which brick laying skills can be a road map for mitigating youths' migration from Nigeria. HO2 There is no significant difference between the responses of teachers and instructors on the extent to which block lock laying skills can be a road map for mitigating youths' migration from Nigeria. HO3 There is no significant difference between the responses of teachers and instructors on the extent to which block lock laying skills can be a road map for mitigating youths' migration from Nigeria.

III. Methodology

This study adopted a descriptive survey research design. The descriptive survey research design is considered suitable because the study elicited data/information from respondents on assessment of brick and block lock laying and concreting skills; a road map for mitigating youths' migration from Nigeria. The population of the study was 48 respondents, comprising 30 brick/block laying and concreting Teachers and 18 Instructors in the four Government Technical Colleges in Rivers State. The study was a census as the entire population was studied. This is in consonance with Maduabum (2007) who stated that, a survey in which the entire population is studied is referred to as census. The choice of census is due to the relatively small size of the population.

instrument for data collection was a structured questionnaire titled "Brick and Block Laying and Concreting Questionnaire (BBLCQ)". The instrument was structured on five point likert type rating scale of Very High Extent (VHE), High Extent (HE), Undecided (UD), Low Extent (LE) and Very Low Extent (VLE). A corresponding numerical value of 5, 4, 3, 2 and 1 was assigned to the response scale for each item as represented below with real limits. The instrument was subjected to face-validation by three experts. The internal consistency of the instrument was 0.82, was obtained as reliability coefficient of the instrument.

Data collected from the respondents were analyzed using mean and standard deviation to answer the five research questions and t-test statistics was used to test the five null hypotheses. In

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order to determine the required or not required level of each of the items in relation to research questions 1 to 3, a decision rule based on real limit of numbers was used. Decision was taken as follows: score of real limit of 3.50 was required. On the other hand, scores less than the real limit 3.50 was not required. Standard deviation values close or wide apart were used to determine the homogeneity in opinion among the respondents. Decision rule for hypothesis; if the calculated value t-cal is greater than the table value t-crit, the null hypothesis is rejected. But if the calculated value is less than the table value, the hypothesis is accepted.

IV. Results

Research Question 1: To what extent is brick laying skills; a road map for mitigating youths' migration from Nigeria?

Table 1: Mean and Standard Deviation of brick laying skills; a road map for mitigating youths' migration from Nigeria

S/NO	Availability of works to carry out the following?	Teachers X	Instructors SD	RMK	Х	SD	RMK
1	Ability to read and interpret drawings	3.57	.692	HE	3.81	1.039	HE
2	Ability to analyse the building plan work	3.56	.732	HE	4.11	.859	HE
3	Ability to identify and select tools for a given task	4.28	.750	HE	4.35	.719	HE
4	Ability to identify and select equipment for the given task	4.93	1.004	HE	3.95	.932	HE
5	Ability to use appropriately the identified tools and equipment	4.16	.941	HE	4.42	.844	HE
6	Ability to prepare ground for a given task	4.95	.875	HE	4.09	.860	HE
7	Ability to select suitable materials for the given task	4.25	.931	HE	4.32	.736	HE
8	Ability to use correct specifications for given task	4.99	1.088	HE	4.31	.790	HE
9	Ability to measure accurately the parameters of a given task	4.05	.990	HE	4.42	.625	HE
	Grand Mean	4.31	0.88	HE	4.19	0.83	HE

Data in Table 1 revealed that teachers had a mean range of 3.56-4.99 and standard deviation range of 0.69- 1.08. While the Instructors had a mean range of 3.81-4.42 and standard deviation range of 0.71- 1.04. The mean shows that the respondents agreed to a high extent that brick laying skills is a road map for mitigating youths' migration from Nigeria. The standard deviation shows the homogeneity of the respondents.

Research Question 2: To what extent is block lock laying skills; a road map for mitigating youths' migration from Nigeria?

Table 2: Mean and Standard Deviation of block laying skills; a road map for mitigating youths' migration from Nigeria

		Teacher	rs		Instructors		
S/NO	Availability of works to carry out the	Х	SD	RMK	Х	SD	RMK
	following?						
1	Ability to apply technical information	1 23	834	HE	4.07	838	HE
	to a given task	4.23	.054		4.07	.050	
2	Ability to record properly all			HE			HE
	dimensional specifications of a given	4.40	.821		4.09	.808	
	task						
3	Ability to construct the given task	1 00	722	HE	4.04	047	HE
	properly without errors	4.09	.144		4.04	./+/	

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4	Ability to take appropriate care of tools during and after work	4.18	.658	HE	4.19	.766	HE
5	Ability to follow the various work stages correctly	4.05	.924	HE	4.12	.982	HE
6	Ability to follow operational sequences in performing a given task	4.19	.953	HE	4.39	.774	HE
7	Observation of relevant precaution in performing a task	3.99	.881	HE	4.19	.860	HE
8	Ability to complete all the work stage as on a given task	3.95	.990	HE	4.26	.856	HE
9	Ability to answer oral questions as it relates to a task completion	3.98	1.03	HE	4.32	.776	HE
10	Ability to provide level surface for given task	4.19	1.04	HE	4.21	.725	HE
	Grand Mean	4.13	0.89	HE	4.19	0.83	HE

Data in Table 2 revealed that teachers had a mean range of 3.98-4.40 and standard deviation range of 0.65 - 1.04. While the Instructors had a mean range of 4.40-4.39 and standard deviation range of 0.72 - 0.94. The mean shows that the respondents agreed to a high extent block lock laying skills; a road map for mitigating youths' migration from Nigeria. The standard deviation shows the homogeneity of the respondents.

Research Question 3: To what extent is concreting skills; a road map for mitigating youths' migration from Nigeria?

Table 3:	Mean	and	Standard	Deviation	of	concreting	skills;	а	road	map	for	mitigating	youths'
migration	from N	igeri	a										

		Teache	ers		Instruct	ors	
S/NO	Availability of works to carry out the	Х	SD	RMK	Х	SD	RMK
	following?						
1	Install pre-cast post-tensioned			HE			HE
	concrete beams on prepared concrete	4.23	.881		4.34	.797	
	piles						
2	Erect expanded polystyrene (EPS)			HE			HE
	wall panel supported with wire mesh	4.44	.926		4.16	.902	
	on both surface						
3	Erect pre-fabricated chimney stacks	1 11	858	HE	3 70	1.050	HE
	made of lightweight material	4.11	.050		5.70	1.039	
4	operate slab profiling tool for easy	1 26	807	HE	3 86	1.025	HE
	slab set	4.20	.077		5.00	1.025	
5	erect and dismantle restricted height	4 09	989	HE	4 17	891	HE
	scaffolding	H. 07	.)0)		ч. 17	.071	
6	handle polycarbonate brick trowel	4 18	889	HE	4 25	830	HE
	for plastering	4.10	.007		7.20	.050	
7	Use hydraulic automatic break down			HE			HE
	pile cap to facilitate placement of	3.97	.954		4.26	.809	
	precast capping beams						
8	Installpre-fabricated beams into the	4 04	1 017	HE	4 32	827	HE
_	correct position	1.01	1.017		1.52	.027	
9	Install closed panel walls, based on	3.88	.880	HE	4.02	.979	HE
	structural frame system	2100	1000			.,,,,	
10	Install pre-cast foundation beams	3.61	0.99	HE	4.02	1.06	HE
	system	4.00	0.00			0.00	
	Grand Mean	4.08	0.93	HE	4.11	0.92	HE

Data in Table 3 revealed that teachers had a mean range of 3.61-4.44 and standard deviation range of 0.88 - 1.02. While the Instructors had a mean range of 3.70-4.34 and standard deviation range of 0.79

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- 1.06. The mean shows that the respondents agreed to high a extent is concreting skills; a road map for mitigating youths' migration from Nigeria. The standard deviation shows the homogeneity of the respondents.

Hypotheses

HO1 There is no significant difference between the responses of teachers and instructors on the extent of brick laying skills; a road map for mitigating youths' migration from Nigeria.

Table 4: t-test analysis on brick laying skills; a road map for mitigating youths' migration from Nigeria.

Respondents		Ν	X	SD	α	DF	t-Cal	t-Crit	RMK
Teachers 0.05	46	30 1.22	4.31 1.96	0.88 No Sig					
Instructors		18	4.19	0.83					

Result in Table 4 revealed that t-cal (1.22) is less than t-crit (1.96) which indicates that the hypothesis stated was accepted. Therefore there is no significant difference between the responses of teachers and instructors on the extent of brick laying skills; a road map for mitigating youths' migration from Nigeria.

HO2 There is no significant difference between the responses of teachers and instructors on the extent of block lock laying skills; a road map for mitigating youths' migration from Nigeria.

Table 5: t-test analysis on block lock laying skills; a road map for mitigating youths' migration from Nigeria.

Respondents		Ν	Χ	SD α		DF	t-Cal	t-Crit	RMK
Teachers	10	30	4.12	0.85					
0.05	46	1.23	1.69	NO SIG					
Instructors		18	4.19	0.83	_				

Result in Table 5 revealed that t-cal (1.32) is less than t-crit (1.69) which indicates that the hypothesis stated was accepted. Therefore there is no significant difference between the responses of teachers and instructors on the extent of block lock laying skills; a road map for mitigating youths' migration from Nigeria.

HO3 There is no significant difference between the responses of teachers and instructors on the extent of concreting skills; a road map for mitigating youths' migration from Nigeria.

Table 6: t-test a	analysis	on conci	eting sk	ills; a roa	<u>ad m</u> ap	for mitig	ating yo	uths' m	gration	from Nigeria.
Respondents		Ν	$\overline{\mathbf{X}}$	SD	α		DF	t-Cal	t-Crit	RMK
Teachers		30	4.08	0.93						
0.05	46	1.21	1.96	No Sig						
Instructors		18	4.11	0.92						

Result in Table 6 revealed that t-cal (1.21) is less than t-crit (1.96) which indicates that the hypothesis stated was accepted. Therefore there is no significant difference between the responses of teachers and instructors on the extent of concreting skills; a road map for mitigating youths' migration from Nigeria.

V. Discussion of Findings

The findings of the study showed that the respondents agreed to a high extent are brick laying skills; a road map for mitigating youths' migration from Nigeria. The standard deviation shows the homogeneity of the respondents. Result in Table 4 revealed that t-cal (1.22) is less than t-crit (1.96) which indicates that the hypothesis stated was accepted. Therefore there is no significant difference between the responses of teachers and instructors on the extent of brick laying skills; a road map for mitigating youths' migration from Nigeria. The findings of the study is in line with Ede, (2020) who noted that skills improvement is necessary for block laying, bricklaying and concreting work craftsmen occupation which is acquired through training. Furthermore, block laying, bricklaying and concreting work craftsmen must have the skills in application of basic levelling procedures, explosive

power tools, operate elevated work platform, erect and dismantle restricted height scaffolding, carry out basic demolition,. This view concord with Ahamadu (2013) who asserted that Information and Communication Technology (ICT) skills in building construction industry is aim to improve workforce in their daily task and to ensure the skills support the industry growth potentially.

The findings of the study showed that the respondents agreed to a high extent is block lock laying skills; a road map for mitigating youths' migration from Nigeria. The standard deviation shows the homogeneity of the respondents. Result in Table 5 revealed that t-cal (1.32) is less than t-crit (1.69) which indicates that the hypothesis stated was accepted. Therefore there is no significant difference between the responses of teachers and instructors on the extent of block lock laying skills; a road map for mitigating youths' migration from Nigeria. The findings of the study is in line with Garba (2019) who indicated the requirement for modern construction skills of block laying, bricklaying and concreting work craftsmen in bonding wall unit. This finding was concord by the World Skill International (WSI). Makienko, (2015) who viewed block laying, bricklaying and concreting work craftsmen as a person who is expected to possess a range of skills, knowledge and able to work on commercial and residential projects where they lay bricks, chimneys acid-resistant brick to kiln and tanks balconies among others. The findings of this study confirmed the study by Nwachukwu (2016) who posited that the need for skills development in the construction industries can be viewed from the introduction of new technological changes such as the new, stronger and lighter materials such as plastics, composite fibers and expanded polystyrene (EPS) among others, increase utilization of assembled component and the adaption of new construction process and prefabricated component.

The findings of the study showed that the respondents agreed to high a extent is concreting skills; a road map for mitigating youths' migration from Nigeria. The standard deviation shows the homogeneity of the respondents. Result in Table 6 revealed that t-cal (1.21) is less than t-crit (1.96) which indicates that the hypothesis stated was accepted. Therefore there is no significant difference between the responses of teachers and instructors on the extent of concreting skills; a road map for mitigating youths' migration from Nigeria. The findings of the study is in line with Odu (2019) stated that the best means available for assessing the effective, psychomotor as well as cognitive skills of the learner includes, direct observation, rating scale, check list, interest invention, participation charts and interview since process assessment has to do with observing a performance and objectively passing a valued judgement over it. Similarly Oroge, (2012) observed that some quality or skills of the student's to be assessed when assessing and grading specific stage of a given work piece should include ability to complete all the work stage on a work piece on schedule supporting this view, Oroge (2012) stressed that process grading has become imperative as this may involve assessing and grading students' ability to read and interpret drawings. In line with above, Uzoagulu (2016) opined that practical task must be evaluated properly so as to induce high standard students' who are expected to think (cognitive), execute, design and construct (psychomotor) and exhibit good cooperative attitude towards others and the use of tools and equipment (affective). It is through observing, rating tasks such as tools election and usage, comportment of the students' care for the tools and equipment, adherence to safety practices of both worker and others.

VI. Conclusion

From the findings, both brick/block lying and concrete works. Adequate acquisitions of these skills are needed and have shown that it can mitigate youth migration from Nigeria. It is essentially for the acquisition of requisite skills, knowledge and understanding for entry into occupational employment and for self-reliance. So there is therefore the need for youths to be trained and retrained for capacity building on current pedagogical techniques, strategies on effective practicing in-line with global practices through workshops and seminars, modern technologies.

VII. Recommendations

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

Building Industries should organize workshop for their craftsmen on the areas where skills improvement are needed to mitigate youth migration from Nigeria.

Training should be organized by the management of the construction firms and should accord priority

attention to the modern skills of construction which in-turn ensure a constant supply of competent craftsmen for the construction industry.

Council of Registered Builders of Nigeria and National Institute of Building should organize workshops and seminars that will expose the craftsmen to the modern skills required in the industry.

References

- Ahamadu, R.M. (2013). National Workshop on revamping technical education to force challenges of technologist development in Nigeria. Organized by Education Trust Fund (ETF) Abuja. Thursday 22nd -23rd June 2005.
- Carling, Jorgen & Schewel, Kerilyn (2017). "Revisiting aspiration and ability in international migration" Journal of Ethnic and Migration Studies, 44:6, 945-963.
- Crawley, H., F. Duvell, K. Jones, S. McMahon & N. Sigona (2017). Unravelling Europe's "Migration Crisis": Journeys over Land and Sea (Policy Press: Bristol).
- Détang-Dessendre C., Drapier C., Jayet H (2013) "Two Tiers Emerging? School Choice and Educational Achievement Disparities among Young Migrants and Non-migrants in Galway City and Urban Fringe", Population, Space and Place, 19:1, 46-59.
- Dibeh, G., A. Fakih & W. Marrouch (2018). Labour Market and Institutional Drivers of Youth Irregular Migration: Evidence from the MENA Region (Bonn: IZA Institute of Labour Economics Discussion Paper Series).
- Ede, S.A. (2020). Development and Preliminary Validation of an instrument for evaluating psychomotor out-comes in Senior Secondary Schools Geography. Unpublished M.Ed. Thesis, University of Nigeria, Nsukka.
- Garba, L.N. (2019). Development of an instrument for evaluating practical projects in wood working. Unpublished Ph.D Thesis, University of Nigeria Nsukka.
- Makienko, N. (2015). Evaluating students' practical skills in vocational and technical Education. Nigeria Journal of Technical Education, 2(9) 12-14.
- National Board for Technical Education, (2013). National Technical Certificate (N.T.C.) and Advanced National Technical Certificate (ANTC) curriculum course specification (Brick/ Block laying and concreting) UNESCO-Nigeria.
- National Board for Technical Education, (2020). National Technical Certificate (N.T.C.) and Advanced National Technical Certificate (ANTC) curriculum course specification (Brick/ Block laying and concreting) UNESCO-Nigeria.
- Nwachukwu, K. M. (2016) Motor skill acquisition. Annual Review of psychology, 42, 213 237.
- Odu, O.K. (2019). Developing and validation of an instrument for assessing students psychomotor performance in Blocklaying and Concreting. Unpublished Ph.D. Thesis University of Nigeria, Nsukka.
- Oroge, C.O. (2012). Practical work in the New Curriculum Teachers Activity and Instructional Assessment: A paper presented at a workshop for Directors Head of Engineering Department, Kaduna Polytechnics, Kaduna.
- Uzoagulu, A.E. (2016). Assessment of the practical measures for quality Evaluation in Technical Education. Studies in Technical Teacher SITTED Journal 1(1)10-12.
- Yalams, S.M. (2020). Development and Validation of a scheme for the Metalwork Process Evaluation of Practical skills. Unpublished Thesis, University of Nigeria, Nsukka.