Work Skills Needs and Job Performance of Graduates of Blocklaying and Concreting Works Trade of Technical Colleges for Employment in South-South Nigeria

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***Abstract*—This study identified the work skills required by technical college graduates in blocklaying and concreting works trade as a means to mitigate the current graduate unemployment in South-South Nigeria using descriptive survey research design. Two research questions guided the study. The study sample consisted of 258 blocklaying and concreting work graduates. A 92 competency item questionnaire developed from literature reviewed was used for data collection. Three experts face validated the instrument. Cronbach Alpha was used to test the reliability of the instrument which yielded a reliability coefficient of .83. Data collected were analyzed using weighted mean and improvement need index. The findings revealed that blocklaying and concreting works graduates needed training in 75 out of the 85 competency items identified in this study; and that the technical college graduates could not perform the competency items to the level needed in blocklaying and concreting works. It was recommended that government should provide adequate training facilities at the technical colleges in order to address work skills the graduates were deficient in; the identified skills where graduates of technical colleges performed poorly should be packaged and used for remedial training programme to remedy the competencies in which blocklaying and concreting works graduates need improvement since they exhibited low level of job performance.**

***Index Terms*—work skills, job performance, graduates, blocklaying and concreting, employment**

I. Introduction

A major challenge facing Nigeria as a developing nation is the issue of unemployment among school graduates. According to [1], it is estimated that about 4.5 million youths, mostly educated, are entering the labour market annually. [2] posited that mass unemployment which has been evident in the last two decades has reached alarming proportion involving all categories of citizens. It therefore becomes imperative that the youths be equipped with work and entrepreneurial skills to elevate them from the present condition of indigency and joblessness. Graduates should acquire skills as skilled workers in order to create wealth, reduce unemployment and become self reliant. A skilled person is most likely to be productive because the person has acquired the habit of performing task on the job.

Skill is the learned capacity or talent to carry out pre-determined results often with the minimum outlay of time and energy. Wikipedia defined a skill as a measure of workers expertise. [3] defined skill as the manual dexterity acquired through repetitive performance of a task. According to [4], skill is a well established habit of performing task in a manner acceptable in a particular profession. Turnbull [5] stated that skill is the ability to do something well. It is the ability and capacity acquired through deliberate systematic and sustained effort [6]. It is the manifestation of acquired knowledge translated into practical use. In the context of this study, skill is the ability to do something well and expertly. Skilled workers are generally more trained, higher paid and have more responsibilities than unskilled workers. Skill thus could be seen as an established way of performing in a job.

Job is a paid position of regular employment. It is a regular activity performed in exchange of payment. It consists of duties, responsibilities and tasks that are specific, and can be quantified, measured and rated. To display an expertise in a job, skill is needed. It is for this reason that the [7] emphasized technical vocational education and training (in which blocklaying and concreting is an aspect) in her educational system to inculcate skills in the students. Blocklaying and concreting was incorporated into the curriculum of technical colleges in order to facilitate the attainment of the objectives on block-moulding, blocklaying and concreting works [8].

Blocklaying and concreting works is a skill-oriented field of study noted for its capability of equipping learners with saleable skills for self-reliance and also paid employment. Blocklaying and concreting work is one of the areas of specialization taught in technical colleges at the intermediate and advanced levels in Nigeria. This programme deals with the acquisition of skills and techniques in blockmoulding, blocklaying and concreting works/occupations to enable an individual earn a living. Skills are acquired to enable the recipient take the best of his/her physical, community and political environment

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[9]. Blocklaying and concreting work is predicated upon the teaching of skills and also demanding the professional use of hands. It is designed to equip students with skills required towards the production of educated persons who can effectively work with their brain and hands.

Blocklaying and concreting works operations involves the skills required in accomplishing given tasks in mixing of mortars by hand, moulding of blocks, laying of blocks, rendering of walls, wall and floor tiling, pointing to walls, creating openings in walls (lintel and arches). It also involves slump test (workability test on concrete), placing concrete in positions, application of admixture to concrete, compaction, curing of blocks and concrete and fixing of concrete joint materials. These operations are based on real jobs and not imitation jobs [10]. The training is to be carried out to the extent that it gives the learners a productive ability with which they can secure and hold employment and be able to profit by it. Blocklaying and concreting works at technical colleges is geared towards the graduation of craftsmen who have skills, knowledge and attitude to meet the demand and needs of the industries and the society at large. Technical college graduates should acquire academic and technical skills that afford employment and sustain their longevity as productive members in today's complex work environment [11].

Technical colleges are post primary schools where students learn skills in various occupations. According to [12], technical colleges are designed to prepare individuals to acquire practical skills, basic scientific knowledge and attitudes required as craftsmen and technicians at sub-professional levels. Technical colleges are the principal vocational institutions in Nigeria that give full vocational training intended to prepare students for entry into various occupations as operatives or artisans and craftsmen [13]. To [14], technical colleges are charged with the production of craftsmen and technicians in various occupations. However, [15] asserted that technical education for workplace readiness, and the opportunities for technical education, are in dire need in Nigeria. A fundamental factor is the educational system's lack of adequate content (curricula, instruction and support variables). To this end, [16] asserted that educators spend time discussing theories, sharing knowledge, experimenting and searching for concepts, while employers who hire products from Nigerian educational system want to see results and want employees to be able to do something with their knowledge. [17] stated that specifically in occupational programmes, a clear implication of employer's complaints is that an emphasis on technical or job specific skill is inadequate. [18] opined that lack of financial resources, inadequate trained vocational teachers and lack of teaching resources have greatly contributed to the unpreparedness of graduates of technical colleges for workforce and their subsequent job performance within the workplace. Technical college blocklaying and concreting works graduates are expected to possess work skills and exhibit high level of job performance in blocklaying and concreting.

Employers require high job performing persons in order to meet their organizational goals. Job performance is a major prerequisite for future career development and success in the world of work. According to [19], high performers get promoted more easily within an organization and have better career opportunities than low performances. However, the current situation in Nigeria according to [20] shows that it will take more than mere re-engineering technical education in its present state to make it more relevant, responsive and effective in producing graduates with needed skills and training that can perform to the satisfaction of their employers.

Technical college graduates will get employment in the jobs if appropriate skills are acquired by them. For one to acquire appropriate skills, the learner should be involved in practical activities. Skills which are required for performing many tasks in work situations are termed work skills. Work skills are practical activities which can help a learner to acquire saleable skills [21]. Work skills are defined by [22] as activities requiring co-ordination and principles of performances to an extent that it becomes easy, efficient and automatic. They entail total array of responsibilities within an activity that an individual performs for work to have been done. In the context of this study, work skills are skills in blocklaying and concreting works that can enhance the employment of graduates of technical colleges.

Employment means working for one's self or an employer. To be employed a person need to be highly skilled in a trade. Graduates of blocklaying and concreting works are expected to possess work skills for success in mixing of mortar by hand, laying of bonds, cavity wall construction, rendering, tiling, tuck-pointing to walls, and construction of semi-circular arch. But the observation of the researcher shows that graduates of blocklaying and concreting works acquired little or no skills in practicing what they have learnt from technical colleges. Most of the graduates remain jobless in the society. [23] posited that half-baked technical graduates (blocklaying and concreting craftsmen inclusive) often cause more damages and havocs to building works contracted to them. And since the government cannot provide jobs for all graduates, it becomes necessary that graduates are equipped with work skills in blocklaying and concreting works for self employment. Thus, there is need to determine what is known by these graduates and what could possibly be done to improve their effectiveness.

Need according to [24] is something used to indicate that a course action is desirable or necessary. In the context of this study, blocklaying and concreting works improvement need is a course or fact that indicates the necessity to organize training for its graduates to improve their competencies in blocklaying and concreting works. This could only be ascertained in the graduates through need gap analysis of their competencies in blocklaying and concreting work activities.

Need gap analysis is a technique for determining the steps to be taken in moving from current state to a desired

future state [25]. It begins with listing of characteristic factors such as competencies, performance level of the present situation, cross listing of the factors required to achieve future objectives and then highlighting the gaps that exist and needs to be filled. [26] posited that need gap analysis is a tool that is used by a company or an individual, to compare its actual performance with its potential performance. In this study, need gap analysis is the computation of the difference in the mean values of the perceived performance of blocklaying and concreting works trade graduates and the mean values of their expected performance in blocklaying and concreting work activities. This study was therefore carried out to identify work skills needs of graduates of blocklaying and concreting works for employment.

II. Purpose of the Study

This study sought to identify the work skills required by technical college graduates for employment in blocklaying and concreting works. Specifically, this study sought to find out the:

1. work skills needs of technical college graduates for employment in blocklaying and concreting works trade in South-South Nigeria;
2. Level of job performance of graduates of blocklaying and concreting works trade of technical college in South-South Nigeria.

III. Methodology

The study adopted the descriptive survey research design. The study was conducted in South-South Nigeria comprising of the following six States: Akwa-Ibom, Balyesa, Cross River, Delta, Edo and Rivers. The population for this study consisted of 258 graduates of blocklaying and concreting works trade in South-South Nigeria. Since the population was few, there was therefore no sample.

The instrument for data collection was a 85-work skill items questionnaire with a five point Likert-type scale in two columns of Needed and Performance. The respondents made judgments upon the statement by ticking (X) in any of these scales: for Needed– Very Highly Needed (VHN)– 5; Highly Needed (HN)– 4; Needed (N) -3; Moderately Needed (MN) -2; and Not Needed (NN) -1, and for Performance- Very Highly Performance (VHP) -5; Highly Performance (HP) -4; Performance (P) -3; Moderately Performance (MP) -2; and No Performance (NP) -1. The blocklaying and concreting work teachers in the technical colleges in South-South Nigeria responded to the needed components of the instrument while graduates of blocklaying and concreting works responded to the performance component.

The instrument was validated by three experts in test and measurement, and technical teacher education from Ambrose Alli University, Ekpoma and University of Benin, Benin City. Their criticisms and corrections were used to produce the final draft of the instrument used in this study for data collection.

The reliability of the instrument was determined using Cronbach Alpha coefficient, and a reliability coefficient of 0.87 was realized.

The questionnaires were distributed by the researcher and three research assistants to the respondents used for this study. Upon completion, the questionnaires were collected from the respondents. The entire 258 questionnaires distributed were dully completed and returned which formed 100% return rate.

The data collected from this study were analyzed using Weighted Mean and Improvement need index (INI) developed by [24] for answering the research questions. The areas of improvement were determined as follows:

i. The mean (X_N) of the required category was determined for each item.
ii. The mean (X_P) of the possessed category was also determined for each item.
iii. The mean gap (MG) was thus determined by finding the difference between X_N and X_P for each item; that is $MG = X_N - X_P$.

a. Where the value of MG is positive (+), it indicates improvement is required, because the level at which the competency item was needed is higher than the level at which graduates could perform the competency.
b. Where MG is negative (-), it indicates improvement is not needed because the level at which the competency was needed was lower than the level at which the teachers could perform the competency.
c. Where MG is zero (0), it indicates improvement is also not needed because the level at which competency item was needed was equal to the level at which the teachers could perform the competency.

IV. Findings

Research Questions 1: What are the work skills needs of technical college graduates for employment in blocklaying and concreting works in South-South Nigeria?

Questions 2: What is the level of job performance of graduates of blocklaying and concreting works trade of technical college graduates in South-South Nigeria?

TABLE I: Need Gap of Technical College Graduates on Blocklaying and Concreting Works for Employment

S/N	Skills	X_N	X_P	$MG = X_N - X_P$	Remarks
A.	**Preliminaries**				
1.	Interpret building working drawings.	3.96	2.03	1.93	N
2	Interpret specifications from the architect.	3.96	2.29	1.67	N
3	Select appropriate tools and equipment for building works.	3.43	3.50	-0.07	NN
4	Use appropriate tools and equipment for a given operation	3.50	3.60	-0.07	NN

5	Observe safety measures on construction site.	3.50	2.61	0.89	N
6	Conduct site investigations.	3.65	2.43	1.22	N
7	Carry out setting-out of buildings.	3.73	2.33	1.40	N
B.	**Production of blocks by hand**				
8	Measure cement and sand to the required proportion	3.29	2.57	1.40	N
9	Mix the batched constituent dry	4.15	2.35	1.80	N
10	Add the required amount of water to the batched constituent.	4.03	2.07	1.96	N
11	Mix the semi-dry constituent to obtain a homogenous paste.	4.09	2.78	1.31	N
12	Place the semi-dry constituent into the mould using the shovel or head pan and consolidate consistently with wooden peg or tamping rod.	4.00	2.51	1.49	N
13	Level up the compacted mix constituents to obtain a smooth surface on the mould.	3.99	2.31	1.68	N
14	Raise the mould to about 75mm above its surface and finally level up the constituents	4.52	3.25	1.27	N
15	Dismantle the mould.	3.42	3.44	-0.02	NN
16	Cure the moulded block after five days.	3.65	3.81	-0.16	NN
C.	**Mix Mortar by hand:**				
17	Measure cement and sand to the desired ratio of 1:4.	3.21	2.01	1.20	N
18	Mix cement and dry sand to look homogenous having a colour of deep ash.	4.43	3.00	1.43	N
19	Make a hollow or conical heap of the cement and sand constituents in order to receive the water for the mixing.	3.20	1.88	1.32	N
20	Measure and add to the mix the desired quantity of water (30 litres) needed for one bag of cement (50kg) and 8 headpans of sharp sand.	4.05	2.33	1.72	N
21	Pour/add the water gradually/skillfully to the dry mix.	3.42	2.23	1.19	N
22	Mix cement and sand after water has been added to obtain a uniform consistency of deep ash colour	3.57	2.01	1.56	N
23	Turn the mortar from non-absorbent surface (bunker) to the head pan or gauge box for use.	4.00	2.06	1.94	N
24	Skillfully manipulate the shovel.	3.93	2.67	1.26	N
D.	**Laying of bonds up to Lintel level**				
25	Set out the position of wall on the floor using blocks, line and pins.	4.14	2.61	1.53	N
26	Cut blocks to various sizes where required.	4.45	2.98	1.50	N
27	Fix the different sizes of blocks correctly to avoid straight joint.	3.57	2.43	1.14	N
28	Terminate each course using appropriate joint.	4.43	2.70	1.73	N
29	Spread mortar evenly on the floor of the marked position.	4.71	3.58	1.13	N
30	Place the first course on the mortar screed.	3.45	2.18	1.27	N
31	Check for alignment of the blocks with a straight edge.	4.70	3.58	1.12	N
32	Check the first course for horizontal level With the spirit level.	4.19	2.67	1.52	N
33	Chuck mortar into the bed joints of the first course by using pointed end of the trowel to point the mortar down and positioning the chucking board along the lengths of two jointed blocks.	4.16	2.68	1.48	N
34	Maintain uniform perpends.	4.22	2.70	1.52	N
35	Pick mortar from the bunker skillfully.	4.71	2.88	1.83	N
36	Maintain perpendicular stop ends.	4.70	3.64	1.06	N
37	Spread mortar screed evenly on the first course to a thickness of 13m	4.54	2.70	1.84	N
38	Place the second course on the mortar screed	4.43	2.81	1.62	N
39	Check for the horizontal alignment of the blocks in the second course with a straight edge.	4.42	3.01	1.41	N
40	Check for the vertical and horizontal levels of the first and second courses with the spirit level	4.37	3.03	1.34	N
41	Lay other courses as demonstrated on the first and second courses until it gets to the 8^{th} course	4.20	2.30	1.90	N
E.	**Cavity wall construction**				
42	Measure and set out the position of the wall on the floor using blocks, lines and pins.	4.27	2.23	2.04	N
43	Spread mortar screed (mix 1:4) evenly on the floor to carry the wall	4.71	3.11	1.60	N
44	Lay the inner leaf of the cavity accurate as: stretcher, half-bat, stretcher, stretcher, half-bat, stretcher, stretcher, and steer, for the second course.	4.42	2.08	2.34	N
45	Lay the outer leaf accurately using stretcher bond as was demonstrated on the inner leaf.	4.41	2.03	2.38	N
46	Fix the wall ties at 900mm horizontally between ties.	4.43	2.32	2.11	N
47	Fix the wall ties at 450mm vertically between ties.	4.37	2.34	2.03	N
48	Use the cavity lath to keep the cavity clear of mortar droppings	4.54	2.41	2.13	N
49	Use the builder's square to check for the squareness of the two leaves of the cavity wall angles.	4.22	2.43	1.79	N
50	Use the spirit level and the wooden float to check for the vertical and horizontal level of the cavity wall.	4.16	2.59	1.57	N

51	Use trowel and chucking board to fill in mortar into the bed joints of the wall	4.19	2.88	1.31	N
F.	**Construction of semi-circular arch using bricks**				
52	Set out two abutments of the arch in Flemish bond of one brick thick using bricks, line and pins.	4.20	2.98	1.22	N
53	Lay the two abutments with bricks up to 8 courses.	4.14	2.78	1.36	N
54	Measure and set out accurately the span of the arch which is 2m.	4.21	2.99	1.22	N
55	Fix the arch centre, struts and folding wedges on the 8th course of the abutments.	4.29	2.38	1.91	N
56	Mark accurately the position of the key brick on the extrados and the width of the bed joint	4.05	2.69	1.36	N
57	Fix two nails at each of the striking points and attached a length of line for straightness of the arch that is to be constructed.	4.00	2.56	1.44	N
58	Check the straightness of the arch along its face by building up the brick work on each side.	3.95	2.88	1.07	N
59	Mark and cut at an angle the brick with bolster and club hammer using the template	3.84	2.78	1.06	N
60	Fix in the cut bricks in their positions on the arch centres.	3.88	2.57	1.31	N
61	Fix in the key brick.	3.85	2.51	1.34	N
62	Fill in the joints of the arch with cement and sand mortar screed of 1:2 mix.	3.73	2.36	1.37	N
63	Dismantle the folding wedges, struts and the arch centres after it has set and hardened	3.41	2.26	1.15	N
G.	**Rendering in Walls**				
64	Prepare the wall surface by splashing water on it.	3.74	3.99	-0.25	NN
65	Place plaster screed of mix 1:4 at convenient distances on the wall with trowel to guide for straightening the surface.	3.78	3.98	-0.20	NN
66	Smoothen the surface of the wall with the wooden float to form a sandy-gritty finish.	4.84	3.00	1.84	N
67	Fix wooden lath or batten at the edge of the wall in order to get the thickness of the plaster.	3.88	3.91	-0.03	NN
68	Smoothen the edge of the corners of the wall with corner rubber after removing the wooden lath.	4.90	3.39	1.51	N
69	Cure the rendered wall by splashing water on it after two days of rendering.	3.71	3.83	-0.12	NN
H.	**Wall Tiling**	4.56	2.85	1.71	N
70	Hack the wall with club hammer and chisel				
71	Clean and wet the hacked wall with water to receive the tiles.	4.53	2.77	1.76	N
72	Spread the mortar screed of 1:2 mix evenly, on the surface and rule off with a straight edge to get a smooth surface.	4.55	2.87	1.68	N
73	Fix wooden lath about 50mm width at the corners and base of the wall to guide the fixing of the tiles.	4.00	2.89	1.11	N
74	Fix the tiles on the mortar screed by making a gentle tap on it with the trowel handle.	4.02	2.68	1.34	N
75	Test the tiles for vertical and horizontal level with spirit level and straight edge.	4.23	3.00	1.23	N
76	Fix the tiles to get a uniform vertical and horizontal joint.	4.22	3.00	1.22	N
77	Cut tiles and fix at corners of the wall.	4.25	2.88	1.37	N
78	Rub the joint flush with a piece of cloth	3.45	3.05	0.40	N
80	Clean and polish the tiles after fixing and setting.	3.55	3.08	0.47	N
81	Test the tiles for vertical and horizontal level with spirit level and straight edge.	4.23	3.00	1.23	N
82	Fix the tiles to get a uniform vertical and horizontal joint.	4.22	3.00	1.22	N
83	Cut tiles and fix at corners of the wall.	4.25	2.88	1.37	N
84	Rub the joint flush with a piece of cloth.	3.45	3.55	-0.10	NN
85	Clean and polish the tiles after fixing and setting.	3.55	3.58	-0.03	NN

Note: X_N =mean of need, Xp= mean of performance, NG=Need gap, N= Needed, NN= Not Needed

In response to research question 1, Table I reveals that 75 out of the 85 competency items had positive need gap values that ranged from to 0.40 to 2.38. However, 10 out of the 85 items had negative need gap values ranging from -0.02 to -0.16. This implies that technical college graduates could perform the competency greater than the level needed blocklaying and concreting works.

In response to research question 2, Table I also reveals that the technical college graduates could not perform the competency items to the level needed in blocklaying and concreting works. The implication is that technical college graduates need re-training in these items.

V. Discussion of Findings

Table I reveals that the graduates of blocklaying and concreting works from technical colleges require improvement in work skills in mixing of mortar by hand, laying of bonds, cavity wall construction, rendering, tiling, and construction of semi-circular arch for employment in Nigeria. Supporting this finding [18] posited that occupational skill is necessary for securing and holding employment in a recognized occupation. This finding is in agreement with the assertion of [21]

that attributed the widening gap between programmes offered in technical colleges and the actual openings available in the labour market to the mismatch between skills demanded in the work place and those provided by the schools. This is evident in most key sectors of the Nigerian economy, where middle level manpower shortages persist and the country remains over-dependent on the skills of expatriates. [27]

VI. Conclusion and Recommendations

Based on the findings of this study, it can be that graduates of blocklaying and concreting works trade of technical college in Nigeria do not possess the requisite work and entrepreneurial skills needed for employment. Based on the findings of this study, the following recommendations were made:

1) Government should provide adequate training facilities at the technical colleges in order to address work skills the graduates were deficient in.
2) The identified skills where graduates of technical colleges performed poorly should be packaged and used for Remedial training programme to remedy the competencies in which blocklaying and concreting works graduates need improvement since they exhibited low level of job performance. The re-training programme could be given to the technical college graduates through workshops and seminars towards reducing employment.

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