IDENTIFICATION OF TASKS AND PROCEDURES NECESSARY FOR ASSESSING PRACTICAL WORK IN BLOCK/BRICKLAYING AND CONCRETING IN TECHNICAL COLLEGES IN NIGER STATE

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Abstract-This Study was designed to identify task and procedures necessary for assessing practical work in Buck/Block laying and concreting in Technical colleges in Niger state. Two research questions were formulated to guide the study. Two null hypotheses was formulated and tasted at the probability of 0.005 level of significance. Twenty-Nine structured questionnaire items were developed and used for the study while three experts were engaged to face-validate the instrument. The instrument was pilot tested on 15 students and reliability coefficient of the entire instrument was 0.87. Descriptive Survey Research Design was used for the study, the respondents for the study were 69 made up of 49 building Technology Teachers, and 20 Registered Builders. The major findings of the study include among others that, some tasks have been identified appropriate for inclusion in the instrument for assessing practical work in Brick/Block laying and concreting in Technical colleges in Niger State. It was recommended that Brick/Block laying and concreting teachers should be acquainted with the developed instrument to enhance uniform standard in assessing student's practical work.

Keywords: Practical work, Concreting, Block/Brick laying, Tasks & Technical Colleges

1. INTRODUCTION

Most of the institutions that provide technical education in Nigeria are the technical colleges. Technical colleges impart skills that lead to the production of craftsmen and technicians who are enterprising and self-reliant (FRN, 2013). Programs offered in technical colleges are skill oriented and performance based (Odu, 2001). These programs allow for effective training and assessment of craftsmen in a wide range of trade subjects that help the students to achieve various instructional objectives in the different domains of learning (Igbo, 1997). Technical and vocational craftsmen who can aspire to higher level of education in achieving professionalism in various technical programs among which is brick/block laying and concreting. Brick/Block laying and concreting like other courses are carried out in classroom and workshop learning and training environments and each complement the other.

Workshop environment in college setting is the introduction of industry in learning situation, designed to equip students for work in their chosen occupation as demanded by the labor market (N.B.T.W; 2001) Brick/Block laying and concreting at Technical college level is designed to provide the trainee with the essential knowledge and skill that will enable him perform competently in all aspects of Brick-work in the construction industry.

On completion of the program, the trainee should be able to manipulate various tools and equipment in the Brick/Block laying and concreting trade. Manipulative skills are required in Brick/Block laying and concreting. Skills are those aspects of technical and vocational education which involve hands-on the-job experience by the students. The National policy on

Education (2013) further outlined general education, theory and related courses, workshop practical, and industrial training/production works as the four components, which the curriculum of each technical training should consist of Brick/Block laying and concreting involve knowledge and training in woodwork and joinery, painting and decoration, building drawing and construction among others (FRN, 2013). Identification of tasks is the process of identifying the major learning activities or operation for carrying a job.

The two major types of task analysis that could be used to improve learning are cognitive task analysis task analysis to yield information on mental process necessary for task performance, while traditional task analysis on the other hand is the process of breaking down large and complex task in the behaviors that support performance of a give job. Yalams (2000) viewed the process of assessing student manipulative skills as which should comprise of assessing student skills, to be carried with a stated degree of accuracy in performing tasks. Due for the potentials of cognitive task analysis (CTA) and Traditional task analysis (TTA) incorporated in to an instructional guide may be used to enhance students' performance in Brick/Block laying and concreting practical work in Technical Colleges. Assessment in any education programme determine learning outcomes in terms of knowledge, skills attitudes, ability and intelligence acquired in the course of study. In education, decisions about staff and student's promotion are based on outcome of assessment. Assessment is the process by which the success or failure of students, teachers or school heads performance is obtained. Kenneth and Keith (2012) viewed assessment as the process of examining as carefully, thoroughly, and objectively as possible an individual, and group of products or programs in order to ascertain strength and weakness. From the foregoing, therefore, assessment can be seen as the systematic process of judging the worth desirability, effectiveness, or adequacy of something, according to a given criteria. Mohammed (2016) emphasized that in educational programme, some unique methods of assessing practical activities are required when students are engaged in a practical task which have to do with repairs of whatever nature, be it individual or in groups. The methods of assessment in manipulative subjects like Brick/Block laying and concreting require an assessment which employs the use of rating scaled or checklist on students as they physically carry out some given tasks, A very important criteria for objective and reliable assessment of task performance as suggested by Yalams (2000) is to construct and use a well-designed assessment instrument. According to him, without valid instruments, teachers will be generating and working with unreliable data which will mislead both the students and their parents this situation is liable to adversely affect the realization of the ultimate goal of the school programme and the attainment of the stated objectives. It is therefore important to develop valid instrument for assessing practical work in Brick/Block laying and concreting in technical collages where the major tasks performed are practiced,

1.1 Statement of the Problem

A standard score is dependent upon method of assessment instrument, particularly in the practical work. Hence the need to reward every step or procedure is necessary according to the National Board for Technical Education (N.B.T.E) (2010) Brick/Block laying and concreting graduates from technical colleges in Niger State and other states in Nigeria are expected to, upon completion of the course, have acquired practical skills to secure paid employment or set up their own and become self-employed and be able to employ others.

National business and Technical Examination Board (NABTEB) (2018) chief examiners report revealed that candidates' performance in Brick/Block laying and concreting practical in Niger State. Similarly, NABTEB marking scheme on rating skills in Brick/Block laying and

concreting practical examination clearly shows that some tasks are not include in the scheme which could affect student performance. This is in line with Gogo (2016) who stated that lack of problem identification, practical guide or instrument for teaching and assessing, students work, diagnosis, evaluation and decision making had led to the decline of educational standard in technical colleges in Nigeria. Although increased emphasis has been placed on skill acquisition in both secondary and vocational schools in Nigeria to equip students with useful skills and to improve their employability opportunities, the practical tasks carried out need to be assessed so as to generate and sustain confidence as well as to maintain standard Mohammed (2016) had noted that some building technology teachers assess students' practical project performance by taking cursory at the finished works and assigning grades they like. This must be mostly due to lack of valid instrument for such assessment. The study was, therefore designed to identify tasks and procedures necessary for assessing students in practical work in Brick/Block laying and concreting in Technical Colleges in Niger State.

1.2 Purpose of the Study

1. Determine tasks appropriate for inclusion in the instrument for assessing practical work in Brick/Block laying and concreting.
2. Determine facilities required for assessing student's practical work in Brick/Block laying and concreting.

1.3 Research Questions

1. What are the tasks appropriate for inclusion in the instrument for assessing Students practical work in Brick/Block laying and concreting?
2. What are the procedures in the development of assessment instrument in Brick/Block laying and concreting?

1.4 Hypothesis

Ho_1 There is no significant differences of teachers and registered builders with respect to the tasks appropriate for inclusion in the instrument for assessing Students practical work.

Ho_2 There is no significant differences between the responses of teachers and registered builders with respect to the procedures in developing assessment instrument.

2. METHODOLOGY

Descriptive survey research design was used for the study. This design was adopted for this study because it Enable the researcher to elicit information from the entire population. The population target for this study is 69 which comprised 49 Brick/Block laying and Concreting teachers of all the Technical Colleges in the state science and Technical School Board, and 20 Registered Builders from Ministry of Housing and Environment, respectively. No sampling was taken because the population was of manageable size. Instrument that was used for data collection is structured questionnaire consisting of 48 items developed by the researcher through extensive literature review based on the research questions. Instrument for this study was validated by two Experts from vocational Teacher Education, Department, University of Nigeria Nsukka, & Department of industrial and Technology Education, Federal University of Technology Minna and one registered builder in the ministry of Housing and environment Minna. The instrument was face validated for Clarity and relevance to this study. To establish the reliability of the instrument, the validated instrument was trial tasted on is student at Federal Science and Technical Collage Orozo Abuja, with the same demography of the study area. The data Obtained from the trial tasting was analyzed using Cranach Alpha reliability formula to

established internal consistency 0.87. The instrument is aimed at assessing practical projects by the teachers of Brick/Block laying and concreting in Technical colleges in Niger State, It determine it's reliability overtime. The instrument was administered by the researcher with the help of one research assistance from each Technical college in Niger State. The data collected for the study was analyzed using mean and standard deviation to answer the research question while T. test statistics was used to test the hypothesis at 0.05 level of Significance.

3. RESULTS

Research Question 1

What are the tasks appropriate for inclusion in the instrument for assessing students practical work in Brick/Block laying and concreting?

In determining the tasks appropriate for inclusion in the instrument, 20 items were provided to the respondents in order to express their opinions the responded to the research question.

Table 1 Mean responses of the Teachers and the Registered Builders on the Tasks Appropriate for Inclusion in the Instrument for Assessing Students Practical Work in Brick/Block laying and concreting (BBC)
N = 69

S/N	Task Appropriate for Inclusion in the Instrument for Assessing Students' Practical work in Brick/Block laying and concreting	$\bar{X}$	S.D	Remarks
1	Ability to read and interpret drawings	4.54	0.61	Appropriate
2	Ability to analyse the building plan work	4.67	0.68	Appropriate
3	Ability to identify and select tools for a given task	4.54	0.74	Appropriate
4	Ability to identify and select equipment for the given task	4.72	0.54	Appropriate
5	Ability to use appropriately the identified tools and equipment	4.72	0.54	Appropriate
6	Ability to prepare ground for a given task	4.57	0.65	Appropriate
7	Ability to select suitable materials for the given task	4.49	0.80	Appropriate
8	Ability to use correct specifications for given task	4.59	0.63	Appropriate
9	Ability to measure accurately the parameters of a given task	4.59	0.63	Appropriate
10	Ability to apply technical information to a given task	4.70	0.55	Appropriate
11	Ability to record properly all dimensional specifications of a given task	4.64	0.62	Appropriate
12	Ability to construct the given task properly without errors	4.48	0.70	Appropriate
13	Ability to take appropriate care of tools during and after work	4.57	0.70	Appropriate
14	Ability to follow the various work stages correctly	4.61	0.62	Appropriate

15	Ability to follow operational sequences in performing a given task	4.65	0.64	Appropriate
16	Observation of relevant precaution in performing a task	4.51	0.68	Appropriate
17	Ability to complete all the work stage as on a given task	4.55	0.70	Appropriate
18	Ability to answer oral question as it relate to a task completion	4.50	0.76	Appropriate
19	Ability to provide level surface for given task	4.62	0.60	Appropriate
20	Ability to have adequate comportment during work	4.54	0.76	Appropriate

Analysis of mean responses of the two groups of respondents from Table 1 reveals that all the items are agreed with mean ranging from 4.48-4.72 This shows that the task are Appropriate for inclusion in the instrument for assessing students practical work in brick/ block laying and concreting in all technical colleges.

Research Question 2

What are the procedures in the development of assessment instrument in Brick/Block laying and concreting?

In answering this research question 9 items were provided to the respondent in other express their opinions.

Table 2 Mean Responses of the Teachers and the Registered Builders on the procedure in the Development of Assessment Instrument

S/N	Procedures for Developing an Assessment Instrument in BBC	$\bar{X}$	S.D	Remarks
1	By reviewing existing instrument	4.58	0.67	Appropriate
2	By determining the domains o be included and the items in the instrument	4.77	0.46	Appropriate
3	By determining the response categories to be included in each domain	4.60	0.62	Appropriate
4	By establishing the reliability and validity of the instrument	4.54	0.80	Appropriate
5	By Developing training materials to accompany the assessment instrument	2.80	1.52	Not Appropriate
6	By clearly defining the aim of the study in the assessment instrument	4.61	0.60	Appropriate
7	By listing out all the attributes characteristics that need to be observed in the instrument	4.55	0.65	Appropriate
8	By deciding on the recording system to be used in assessment instrument	4.48	0.76	Appropriate
9	By constructing the requirement model for recording observation	4.74	0.56	Appropriate

The analysis of the data presented in Table 3 revealed that the respondents agreed on 8 out of the 9 items on the procedures in the development of assessment instrument with the mean ranging from 2.80-4.77 but items 5 was rated disagreed. This signifies that the assessment instrument possess all 8 characteristics outlined in the table but the item relating to developing training materials to accompany the assessment instrument was disagreed.

3.1 Testing of Hypotheses

Ho_1 there is no significant difference between the responses of teachers and registered builders with respect to the tasks appropriate for inclusion in the instrument for assessing students practical work.

Table 3 t-test Analysis of the responses of Teachers and Registered Builders on the Tasks Appropriate for Inclusion in the Instrument for Assessing Students' Practical work in BBC

S/N	Item	Teachers $n_1 = 49$		Registered Builders $n_2 = 20$		t-cal	Sig(2-Tailed)	Remarks
		$\bar{X}_1$	$S.D_1$	X_2	$S.D_2$			
1	Ability to read and interpret drawings	4.53	0.61	4.55	0.60	-.119	.905	NS
2	Ability to analyse the building plan work	4.71	0.57	4.55	0.89	.911	.366	NS
3	Ability to identify and select tools for a given task	4.43	0.79	4.80	0.52	-1.931	.058	NS
4	Ability to identify and select equipment for the given task	4.71	0.58	4.75	0.44	-.248	.805	NS
5	Ability to use appropriately the identified tools and equipments	4.71	0.54	4.75	0.44	-248	.805	NS
6	Ability to prepare ground for a given task	4.55	0.65	4.60	0.68	-.281	.780	NS
7	Ability to select suitable materials for the given task	4.47	0.82	4.55	0.76	-.379	.706	NS
8	Ability to use correct specifications for given task	4.55	0.65	4.70	0.57	-.896	.374	NS
9	Ability to measure accurately the parameters of a given task	4.63	0.57	4.50	0.76	.797	.428	NS
10	Ability to apply technical information to a given task	4.65	0.56	4.80	0.52	-1.006	.318	NS
11	Ability to record properly all dimensional specifications of a given task	4.53	0.68	4.90	0.31	-2.326	.023	S
12	Ability to construct the given task properly without errors	4.46	0.71	4.50	0.69	-.164	.870	NS
13	Ability to take appropriate care of tools during and after work	4.69	0.56	4.35	0.93	1.662	.101	NS
14	Ability to follow the various work stages correctly	4.69	0.55	4.40	0.75	1.806	.075	NS
15	Ability to follow operational sequences in performing a given task	4.67	0.66	4.60	0.60	.432	.667	NS
16	Observation of relevant precaution in performing a task	4.45	0.71	4.65	0.59	-1.120	.254	NS
17	Ability to complete all the work stage as on a given task	4.61	0.64	4.40	0.82	1.150	.254	NS
18	Ability to answer oral questions as it relates to a task completion	4.39	0.81	4.80	0.52	-2.095	.040	S
19	Ability to provide level surface for given task	4.61	0.63	4.65	0.49	-.273	.814	NS
20	Ability to have adequate comportment during work	4.61	0.70	4.35	0.87	1,309	.195	NS

NS = Not Significance

Data presented in Table 3 revealed that the t-calculated values for twenty items were less than the t-table values T. Calculated values ranged from 0.40 to 0.905 which less then t. Table values.

Ho_2 there is no significant difference between the responses of teachers and registered builders with respect to the procedures in developing assessment instrument. Data for testing Ho_2 are presented in Table 4

Table4 t-test Analysis of the responses of Teachers and Registered Builders on the procedures for developing Assessment Instrument in BBC

S/N	Item	Teachers $n_1 = 40$		Registered Builders $n_2 = 20$		t-cal	Sig(2-Tailed)	Remarks
		$\bar{X}_1$	S.D$_1$	X_2	S.D$_2$			
1	By reviewing existing instrument	4.63	0.64	4.45	0.76	1.023	.310	NS
2	By determining the domains o be included and the items in the instrument	4.76	0.48	4.80	0.41	-.367	.715	NS
3	By determining the response categories to be included in each domain	4.53	0.68	4.80	0.41	-1.649	.104	NS
4	By Establishing the reliability and validity of the instrument	4.47	0.87	4.70	0.57	-1.092	.279	NS
5	By developing training materials to accompany the assessment instrument	2.73	1.55	2.95	1.47	-.531	.597	NS
6	By clearly defining the aim of the study in the assessment instrument	4.63	0.56	4.55	0.68	.517	.607	NS
7	By listing out all the attributes or characteristics that need to be observed in the instrument	4.59	0.61	4.45	0.76	.815	.418	NS
8	By deciding on the recording system to be used in assessment instrument	4.41	0.81	4.65	0.59	-1.204	.233	NS
9	By constructing the requirement model for recording observation	4.69	0.58	4.86	049	-1.052	.297	NS

NS = Not Significance
SD = Standard Deviation

Key:

$\bar{X}_1$ = Mean responses of teachers
$\bar{X}_2$ = Mean responses of registered builders
N_1 = number of teachers
N_2 = number of registered builders
$\bar{X}_T$ = grand mean of all responses

$$\bar{X}_t = \frac{X_1 + X_2}{2}$$

Data presented in table 4 above revealed that the T-calculated value for nine items were less than the table value. T-Calculated values ranged value. Therefore, the finding revealed that

there is no significant difference between the mean responses of building Technology Teachers and registered builders on he tasks appropriate practical work in Brick/Block Laying and concreting in Technical Colleges in Niger State.

4. Discussion of Findings

The research question one dealt with identification of tasks appropriate for inclusion in assessing practical work in Brick/Block laying and concreting in Technical colleges in Niger State. The Findings reveals that the tasks identified appropriate for inclusion in the instrument will improve student performance in practical work. This finding was in line with the views of Yalems (200) who observed that in combining process and product evaluations certain attributes of the learners such as ability to analyses the plan work, the skills, and procedures in the use of tools and equipment, ability to construct the given task properly without errors among others could be easily and systematically observed objectively and comprehensively assessed.

Research question two dealt with procedures in developing assessment instrument. The findings in Table 3 reveals that all procedures were found to be relevant in developing assessment instrument in Brick/Block laying and concreting practical work except item five which is on developing training materials to accompany the assessment instrument. This finding was in line with views of white and Ahmadu (2003) who suggested that to achieve the goal of developing an assessment instrument, determine the domains to be included in the items define the response categories to be included in each domain.

Research question three dealt with the facilities required in assessing students practical work in Brick/Block laying and concreting. The findings in table 4 reveals that all the facilities listed one required in assessing student's practical work. This findngs is in line with the views of Ezeji (2004) who observed that adequate provision of facilities in carrying out practical exercise helps students acquire industrial technical knowledge and skills through creative and problem solving, learning experiences involving such activities as experimenting, planning, constructing evaluating, and using tools machines materials and processes.

5. Conclusion

Based on the findings of this study the following conclusions are drawn: the graduates of Technical Colleges required relevant skills to perform competently on the practical work. An assessment instrument developed if adopted for use in all the Technical Colleges in the state will help the students to improve on their practical performance.

5.1 Recommendations

Based on the findings of the study the following recommendations were made:

- Brick/Block laying teachers at Technical Colleges should de-emphasis the use of product assessment only but, rather combine both product and process assessment method
- Examination bodies such as National Business and Technical Board (NABTEB), National Examination Council (NECO), West African Examination Council (WAEC) should consider and adopt the developed instrument for assessing student's practical performances in Brick/Block laying and concreting at NTC and ANTC levels.
- Brick/Block laying teacher's should be acquainted with the developed instrument to enhance uniform standard in assessing student's practical work.

- All the characteristics or attribute that need to be observed in students should be listed out with the required mode of grading before assessing students practical work
- Niger State science and Technical Schools board should also adopt the developed instrument for assessing student's practical performance at technical college level

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