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**Assessment of Tasks and Procedures Necessary for Students**

**Practical Work in Block/Brick Laying and Concreting in Technical Colleges in Niger State**

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**Abstract**

*This study was designed to assess tasks and procedures for practical work in Brick/Blocklaying and Concreting in Technical Colleges in Niger State. Three research questions were formulated to guide the study. One null hypothesis was formulated and tested at the probability of 0.05 level of significance. Thirt 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. Survey research design was adopted, the respondents for the study was 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/Blocklaying and Concreting in Technical Colleges in Niger State. It was recommended that Brick/Blocklaying and Concreting teachers should be acquainted with the developed instrument to enhance uniform standard in assessing student’s practical work*.

**Keywords:** Tasks, Procedures, Assessment, Practical work, Block/Bricklaying, Concreting

**Introduction**

Among the institutions that provide technical education in Nigeria are the technical colleges. Technical colleges impart necessary skills that lead to the production of craftsmen and technicians who are enterprising and self reliant (FRN, 2013). Programmes offered in technical colleges are skill oriented and performance-based (Odu, 2019). These programmes 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, 2017).

The national curriculum for technical colleges centres around the psychomotor domain with relevant emphasis on cognitive and effective domain (FRN, 2013; NBTE, 2013). By implication, much attention is focused on psychomotor or practical component of studies in technical colleges but this is done without overlooking the relevant emphasis on critical areas of cognitive and effective components. The psychomotor component requires that the appropriate materials that are’ necessary for effective training of the craftsman in his/her chosen trade must be available. The availability and effective utilization of materials would help to achieve the skills of technical education as out lined in the national policy on education (N.P.E, 2013), therefore includes: To provide trained manpower in applied science, technology and business particularly at the craft, advanced craft and technical levels; and to give training and impart the necessary skills to individual, who shall be self-reliant economically. Another goal of Technical and vocational Education in Nigeria is the production of skilled, self reliant and enterprising craftsmen and technicians who can apply their technical knowledge and vocational skills for solving industrial,

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and economic problems of the nation (FRN, 2013). Part of the effort for achieving this objective is the implementation of National Technical certificate (N.T.C) and Advanced Technical Certificate (A.N.T.C) programmes in Technical colleges. The N.T.C and A.N.T.C programmers are aimed at producing technical and vocational craftsmen who can aspire to higher level of education in achieving professionalism in various technical programmes 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 labour market (N.B.T.E; 2020) Brick/Blocklaying 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 programme, 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/Blocklaying and concreting involve knowledge and training in woodwork and joinery, painting and decoration, building drawing and construction among others (FRN, 2013). The importance of shelter and need for a conducive environment for domestic and industrial works has necessitated the demand for quality building. The development of an appropriate instrument for assessing the performance of students in brick / block laying and concreting will help to improve the quality of products.

Identification of tasks is the process of identifying the major learning activities or operation for carrying a job. (Ede, 2020) identification of tasks could be used for improving skills training in complex tasks. While task analysis is the process of breaking down complex takes for easy learning. The major types of tasks analysis that could be used to improve learning are cognitive task analysis and tradition al task analysis. Cognitive task analysis and extension of behavioral 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 behaviours that support performance of a give job. Yalama (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/ blocking and concreting practical work in Technical colleges.

Procedures: is the accepted and correct way of doing something. In relation to workshop procedures in building construction, procedure on be seen as the correct and accepted ways of deriving set objectives of the programmes from planned and systematic follow – up of activities designed for the purpose. Procedures in workshop activities are process – based, (Nwachukwu, 2016). Process in this sense refers to series of actions, activities or events which have a particular

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result. Procedures as noted, workshop environment in school setting is the introduction of industry in learning situation as demanded by the solo economic needs of the people (Ezeji, 2014) school workshop brings about technology of industry in educational curriculum in which students are exposed to practical learning situation for optimum utilization of potentials abilities, creative imagination and aptitude in using available materials and tools for production works (Olson, 2012, Nwachukwu, 2016). Technology of industry has to do with methods, processes and procedures in technical schools should be same as the procedures of industry (Olson, 2012) in the same vein, workshop procedure in building construction programmes should be same as procedures in building industry, and should reflect workshop procedures in technical education programmes.

Assessment in any educational programme determines learning outcomes in terms of knowledge, skills attitudes, ability and intelligence acquired in the course of study. In education, decisions about staff and students 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 programmes 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. Okorie and Ezeji (2015) emphasised 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 scales or checklist on students as they physically carry out some given tasks. Mohammed (2018) and Makienko (2015) also asserted that a special method for assessment of manipulative skills is necessary because in performing any operation or task such as in brick/block laying, certain techniques and attributes to be noticeable in students which cannot be guessed at or judged intuitively must be critically considered when assessing students, performance. Assessment should be based on a laid down criteria regarding the quality or characteristics of the finished products, or final tasks (Okoro, 2019). It is pertinent to note that a good test must be valid and reliable. Validity implies that the test measures correctly what it suppose to measure while reliability means that the test measures consistently at repeated administrations, what it is designed to measure. Hoover (2015) stated that test validity is the extent to which the inferences, conclusions and decisions made on the basis of test scores are appropriate and meaningful. According to him, if a test is not valid there is no point in discussing reliability because test validity is required before reliability can be discussed in any meaningful way.

A reliable score is dependent upon standard method of assessment instrument, particularly in the practical work. Hence the need to reward every step or procedure is paramount. According to the National Board for Technical Education (N.B.T.E) (2013) 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) (2014) chief examiners report revealed that candidates’ performance in Brick/Block laying and concreting practical examination was too low. This is affirmed by the preliminary study carried out by the researcher in Niger state.

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Similarly, NABTEB (2012) marking scheme on rating skills in Brick/Blocklaying and concreting practical examination clearly shows that some tasks are not included in the scheme which could affect student performance. This is in line with Goton (2018) 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 (Okoro, 2019). Garba (2019) 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.

**Purpose of the Study**

The major purpose of this study was to develop and validate an instrument for assessing practical work in Brick/Blocklaying and Concreting in Technical Colleges in Niger State. Specifically the study was to:

1. Determine tasks appropriate for inclusion in the instrument for assessing practical work in Brick/Blocking and Concreting.

2. Determine procedures for developing assessment instrument in Brick/Blocklaying and Concreting.

3. Determine facilities required for assessing student’s practical work in Brick/Blocklaying and Concreting.

**Research Questions**

The following research questions guided the study.

1. What are the appropriate tasks for inclusion in the instrument for assessing practical work in Brick/Blocking and Concreting in technical collages in Niger State?

2. What are procedures for developing an assessment instrument in Brick/Blocklaying and Concreting in technical collages in Niger State?

3. What are the facilities required for assessing students practical work in Brick/Blocklaying and Concreting in technical collages in Niger State?

**Hypotheses**

The following hypotheses were formulated and tested for the study at 0.05 level of significance

**H01:** There is no significant difference in the mean responses of Brick/Blocklaying and Concreting Teacher and Registered builders on task appropriate for inclusion in the assessment instrument.

**H02:** There is no significant difference in the mean responses of Brick/Blocklaying and Concreting Teachers and Registered builders on procedures for developing assessment instrument in Brick/Blocklaying and Concreting in technical collages in Niger State

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**Methodology**

The descriptive survey research design was used for the study. This design was adopted for this study because it enables the researcher to elicit information from the entire population. This study was carried out in Niger State in order to develop an instrument for assessing practical work in Brick/Blocklaying and Concreting in Technical Colleges in the state based on the report from Niger State Ministry of Education on poor performance of students in National Business and Technical Examination (NABTEB) practical examination in Brick/Blocklaying and Concreting in 2020.

The target population for this study is 69 which comprised 49 Brick/Blocklaying 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. The teachers and registered builders were chosen because they are involved in practical in brick/ blocklaying and concreting. No sample was taken because the population was of a manageable size. The preliminary 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. A 5 point rating scale was used for Section B, C, D, and E with response options as Very Appropriate (VP), Apprproiate (A), Fairly Appropriate FD), Disagreed (D), strongly Disagree (SD). The weighted value assigned to response options are 5, 4, 3, 2, and 1 respectively. The preliminary survey instrument for this study was validated by two experts from Department of Industrial and Technology Education, Federal University of Technology Minna and one registered builder, in the ministry of housing and environment Minna. Therefore, 48 items were found suitable for the study and produced in the final drafting of the instrument. To establish the reliability of the instrument, the validated instrument was trial tested on 15 students at Federal Science and Technical College Orozo Abuja, with the same demography of the study area. The data obtained from the trial testing was analysed using Cronbach Alpha reliability formular to establish internal consistency of the instrument for the study. The reliability coefficient obtained was 0.87. 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 analysed using mean and standard deviation to answer the research questions while, t-test statistic was used to test the hypothesis at 0.05 level of significance. For selecting the task appropriate for inclusion in the instrument a mean cut up of 3.50 was chosen. The resulting mean scores was interpreted relatively to the concept of the real lower and upper limit of numbers 1-5 as used on the rating scale adopted for the study. Therefore, any task with mean of 3.50 and above is appropriate, and any task with mean score of 3.49 or less is not appropriate.

**Results and Discussion**

**Research Question 1**

What are the tasks appropriate for inclusion in the instrument for assessing students In determining the tasks appropriate for inclusion in the instrument, 20 items were provided to the respondents in order to express their opinions the responses to the research question, are presented in Table 1.

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**Table 1: Task Appropriate for Inclusion in the Instrument for Assessing students’ Practical work in Brick/Blocklaying and Concreting,**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/N Item** | | **Mean** | **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  equipments | 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 questions as it relates 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 |