



## Improving Students' Mastery of Practical Skills in Blocklaying, Bricklaying and Concreting through Activity-Based Instruction in Technical Colleges in Gombe State

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### ABSTRACT

*The improvement of students' practical skills in Block/Bricklaying and Concreting programme through activity-based instruction in Gombe State technical colleges is the purpose of this study. Two specific purposes were outlined to guide the researcher. A descriptive survey design was used where opinion of the teachers of Blocklaying, Bricklaying and Concreting (BBC) programme were sought on the use of activity-based instructional approaches in the teaching and learning processes. The population was made up of all the 41 teachers of BBC from the six technical colleges in Gombe State. A structured questionnaire with 30 items was used as instrument for data collection. The instrument was validated by three experts and Cronbach Alpha formula was used to determine the internal consistency of the instrument. The data gathered from respondents was analysed using mean and standard deviation. The following findings were made from the study: 19 activity-based teacher preparation that can improve students' mastery of practical skills in BBC, in technical colleges, in Gombe State and 11 activity-based strategies that can improve students' mastery of practical skills in BBC through activity based instruction in technical colleges in Gombe State. Based on the findings of the study, the following recommendations were made- activity-based teaching methods identified in this study can be integrated into the curriculum of BBC and other related trades for training and ensuring students' mastery of practical skills in Technical Colleges in Gombe State; workshop and seminars should be organized for BBC teachers on current pedagogies in BBC from time to time.*

### ARTICLE INFO

#### Article History

Received: January, 2020

Received in revised form: March, 2020

Accepted: May, 2020

Published online: July, 2020

### KEYWORDS

Students' mastery of practical skills, Blocklaying, Bricklaying, Concreting, Activity-Based and Technical Colleges

### INTRODUCTION

Blocklaying, Bricklaying and Concreting (BBC) is one of the programmes offered by the students of the six NBTE accredited technical colleges

in Gombe State. It is a component of vocational and technical education, which is comprehensively termed as " those aspects of the educational processes involving, in addition to general education, the study of technologies and related



sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of the economic and social life” (Federal Republic of Nigeria, 2008). BBC programme is specifically designed to give training and impart the necessary BBC skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant (National Board for Technical Education, 2008).

In an attempt to achieve the above objective, BBC curriculum in Gombe State technical colleges is broadly divided into three main components: General Education, which accounts for 30 percent of the total hours required for the programme; Trade Practice and Related Studies which account for 65 percent; and Supervised Industrial Training/Work Experience, which accounts for about 5 percent of the total hours required for the programme (NBTE, 2012). The provision of more duration for practical work emphasizes the significance of attaining of practical skills by the students of BBC programme during practical lessons.

Skills acquisition is the most important objective of BBC programme. To achieve it all hands must be on deck. The student himself plays a major role in acquiring relevant skills. As the most benefactor of the whole instruction which will help him in the future, therefore, he must be in the right mind-set, determined and motivated to be able to perform in the learning activities, thus, allowing the teacher the necessary opportunity to carry out his work effectively. The student must be attentive to the teacher’s instruction as well as contribute positively for the success of the instruction. The student must equally be in good condition of health and capability to be able to exert the right postures in conducting the practical as he is expected to do.

The teacher is expected to plan his lesson properly by carefully choosing the objectives of the lesson, devising on making the learners participate in the learning process in a more responsible way, selecting the appropriate methods of instruction as well as determining the appropriate strategies of evaluation.

Another strategy of instruction that may be helpful in teaching of practical skills in BBC is the activity based instructional method, a method where the learner is actively engaged in a task (Francis 2010). Francis went further to state that the focus of this strategy is on making the abstract concrete and on learning by doing either teacher-driven - with direction from an instructor - or learner-driven with the learner having freedom to explore. This method provides opportunities for students to express themselves and explore possible ways to solve a certain problem or to manipulate materials with the teacher’s role reduced to that of facilitator.

Block/Bricklaying and Concreting programme in Technical Colleges is aimed at producing craftsmen who will be able to perform basic functions in BBC, both in private and public sectors (NBTE, 2001). It is a skill oriented programme whose graduates are expected to be self-employed or to set-up their businesses after graduation. The aim of this programme in Gombe State is however defeated “since most of these graduates usually fall short of acquiring the necessary skills that will enable them function effectively” as lamented by Bako (2014). Part of this problem may as well be hinged on lack of teaching effectiveness Odo et al, (2012).

In teaching a trade like BBC, the teacher needs to plan and design his lesson where the student is expected not only to observe, but also get engaged in carrying out practical skill-generating tasks



that are specified in the curriculum. There are many methods of teaching that can guarantee the above, but most technical school teachers as pointed out by researchers like Odo et al (2012) are fond of adopting teaching methods like lecture and discussion where only chalk and board are required in their dispensation. This situation is prevalent in Gombe State where most Technical colleges graduates fail to acquire the necessary skills for them to function effectively in own occupation or public employments. The end result is therefore unfavourable to the student, teacher and the society in general.

#### **Research Objectives**

Two purposes are outlined as follows:

1. Determination of the activity-based teacher preparation for improving students' mastery of practical skills in Blocklaying, Bricklaying and Concreting in Gombe State technical colleges
2. Determination of the activity-based instructional strategies for improving students' mastery of practical skills in Blocklaying, Bricklaying and Concreting in Gombe State technical colleges

#### **REVIEW OF RELATED LITERATURE**

An effective instructional process comprises three basic steps. The first is planning instruction, which includes identifying specific expectations or learning outcomes, selecting materials to foster these expectations or outcomes, and organizing learning experiences into a coherent, reinforcing sequence. The second step involves delivering the planned instruction to students that is, teaching them. The third step involves assessing how well students learn or achieve the expectations or outcomes. To carry out the instructional process, the

three steps should be aligned with one another. That is, the planned instruction should be logically related to the actual instruction and the assessments should relate to the plans and instruction.

The central idea in activity-based instruction in vocational trades is to help the student think about the nature of learning and develop conscious control over tools for learning, the position is taken that major tasks of vocational education institutions and by extension, the Bricklaying, Blocklaying and Concreting teachers are to increase capacity for learning that the student's construction and mastery of skills can become increasingly sophisticated and efficient if we make the student an insider to the learning process (Joyce and Weil in Engdasew 2013).

Teachers are expected to utilise instructional resources and methods to achieve this. Duckett and Tartarkowski (2005) suggest that planning effective teaching and learning sessions should include the following processes: specifying the aims and objectives or outcomes for the session, how to review the previous session and explaining the links to the current and next sessions, identifying appropriate content, activities and strategies by which the learners will learn, identifying strategies by which learning will be assessed, selecting the resources, materials and media to support learning and considering how to summarise at the end of the session. The researchers further mention what the teacher should do in particular while planning teaching. These activities include:

Every single learner is expected to be completely engaged and participating; ensure they are enjoying their lessons, they are excited about it and that their learning is rigorously assessed; that for every learner to travel some distance in a lesson there needs to be very



clear learning outcomes set for them. The teacher really needs to know very well where those learners are at and in order to really contextualise the learning, make it relevant and interesting for them, know what they're interested in, what their aspirations are, and develop aspirations in them. Where do they want to work in the future? What are their strengths, how do they prefer to learn? So all of that background information is really important in order to plan teaching.

When planning and preparation for teaching a vocational subject like the ones that could be found in BBC programme, Faraday, Overton, and Cooper (2011) advised on using the strategies for differentiation. According to them 'Differentiation' is central in effective planning, ensuring that all learners can learn effectively and are sufficiently challenged. All definitions of differentiation are supported by a view of learners as distinct personalities. Some approaches to differentiation suggest that differentiation needs to be considered at the planning stage of a session.

Planning a particular learning event can be described as the end result of five basic instructional decisions:

- 1) Choosing learning goals
- 2) Making practical pedagogical decisions about the nature of the learning experience
- 3) Selecting and sequencing appropriate activity types to combine to form the learning experience
- 4) Selecting formative and summative assessment strategies that will reveal what and how well students are learning
- 5) Selecting tools and resources that will best help students to benefit from the learning experience being planned (Harris and Hoffer 2009).

While the learning objectives and standards should remain the same, time and support given to learners by the teacher should be varied according to individual learner need. There is also the aspect of differences in the way learners prefer to learn visual, audio or kinaesthetic – to be taken into account when using differentiation in the learning process. Understanding the different learning needs of individual learners, their strengths and weaknesses and how they learn best is of paramount importance to enable effective differentiation.

The Teachers in all vocational areas, as posited by Faraday et al (2011), use learning activities that actively engaged learners and encouraged them to work together. They further enumerate four stages in constructing for learning:

- a) Planning or preparation stage, identifying the current knowledge, skills and understanding that learners already have about a topic – What they already know
- b) The teacher outlines the new concepts to be developed, exploring with learners what knowledge, skills and understanding they will need to develop
- c) Both teachers and learners identify how the new knowledge relates to what they already know and how it relates to their previous experience
- d) Learners' new learning is assessed.

In the first stage, i.e. planning or preparation the teacher of BBC is expected to ensure that the students are in good mood and are likely to cooperate and hence make contributions as the lesson progresses. The teacher should try to draw from previous knowledge of the students using diverse techniques like asking



questions that relate to the present topic; showing a video clip that contains relevant information about the topic, then throw questions to student about the video clip. The teacher may also introduces the session teacher by recapping on the previous week's session the different types of questions the students need to ask to be able to meet their needs.

In support of Nwosu's (1998) view, Kayode (2001) emphasized on the need for the teacher to adopt a technique that would explore the content of a subject in its entirety, thereby making learning a worthwhile process. Kayode (2001) reaffirmed that teachers have the potentials through training and experience to change the behaviour of a learner irrespective of the learner's characteristic disposition. This lecture method according to Offorma (1994) facilitates a more functional organization of knowledge. Thus, it promotes transfer of learning because the learner can draw experiences from wider subject areas to solve contemporary problem.

#### METHODOLOGY

A descriptive survey design was employed in this research. The survey research design is suitable for this study since data will be collected through questionnaire from the intended respondents. The area of the study was Gombe State, which is located in the North-East of Nigeria, sharing boundaries with Adamawa, Bauchi, Borno, Taraba and Yobe states. This study was focused on technical colleges in Gombe State. The population was made up of all teachers of Bricklaying, Blocklaying and Concreting in the six technical colleges in Gombe State. The number of these teachers at the time of conducting this research was forty one (41). This research work did not require any sample, because the number of population is manageable. A structured

questionnaire titled Activity-Based Instruction Questionnaire (ABIQ) was used for data collection. The questionnaire contained 30 items sub-divided into A and B.

#### RESULTS AND DISCUSSION

The data presentation and analysis based on the research questions are organized and presented as follows:

**Research Question 1:** What activity-based teacher preparation are required for improving students' mastery of practical skills in Blocklaying, Bricklaying and Concreting in Gombe State technical colleges?

Research question 1 was set to determine the areas of preparation required from the teacher for an activity-based instruction that can improve the students' practical skills competencies in BBC. Nineteen items were identified from the NBTE syllabus for NTC students in BBC trades. The data for this is presented in Table 1. The data clearly demonstrates that of all the 19 items, only 4 were not accepted by the respondents as relevant preparations for the teachers to make a good activity-based skills improvement classes.

The fifteen items accepted scored means ranging between 3.11 and 4.22. Among the accepted items, include "considering the students' strength in the mastery of practical skills" which scored the highest mean 4.22 while considering individual learner needs scored the least mean 3.11. This does not appear out of place since the students are being prepared for the same level of competence and exams irrespective of the individual learner needs. From the foregoing analysis, the researcher safely concludes that several teacher preparation as identified by the study are important for teachers to give a good



activity-based skills improvement instruction.

Table 1: Mean Responses on the Activity-based Teacher Preparation for Improving Students' Mastery of Practical Skills Blocklaying, Bricklaying and Concreting in Technical Colleges in Gombe State  
 N1=22, N2=19

No.	Teacher preparation	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_t$	$\delta$	Remarks
1	Choosing learning goals	4.26	3.64	3.95	0.76	Agree
2	Selecting appropriate activity types to form the learning experience	3.53	4.23	3.88	0.56	Agree
3	Sequencing activity types to form the learning experience	2.47	3.09	2.78	0.52	Disagree
4	Identifying what skills, the students already have for the task ahead	4.47	3.09	3.78	0.72	Agree
5	Selecting resources that will best help students to benefit from the learning experience	3.63	3.41	3.52	0.95	Agree
6	Identifying strategies by which the students will actively participate and hence learn the skill	2.63	4.73	3.68	0.57	Agree
7	Preparing students to develop control over tools for learning the task	2.84	4.18	3.51	0.69	Agree
8	Planning on reviewing previous sessions	4.21	3.00	3.61	0.36	Agree
9	Planning on helping students to develop suitable aspirations for learning practical skills to be able to carry out the task	2.68	3.14	2.91	0.66	Disagree
10	Identifying instructional methods that can be used in conjunction with activity-based method improve on the mastery of practical skills	3.42	4.27	3.85	0.74	Agree
11	Planning to draw from previous knowledge of the students using diverse techniques	3.16	4.50	3.83	0.44	Agree
12	Identifying the right activity-based instructional strategies by which mastery of skills will be assessed	4.42	3.32	3.87	0.49	Agree
13	Ensuring that the students are in good mood as the lesson progresses.	3.47	2.09	2.78	0.40	Disagree
14	Ensuring that the students are likely to make contributions as the lesson progresses	2.63	3.05	2.84	1.02	Disagree
15	Preparing for possible questions from students to be able to meet their needs.	4.53	3.41	3.97	0.59	Agree
16	Considering individual learner needs.	4.37	2.23	3.38	0.78	Disagree
17	Planning for each learner to be completely engaged and participating in the mastery of practical task	3.79	4.36	4.08	1.04	Agree
18	Considering the students' strengths in mastery of the practical skill	4.26	4.18	4.22	0.91	Agree
19	Encouraging the students to work together especially in groups	2.95	3.27	3.11	0.74	Disagree

Key: N1 = Number of teachers with NCE ; N2= Number of teachers with degree  $\bar{X}_1$  = Mean of teachers with NCE,  $\bar{X}_2$  = Mean of teachers with degree;  $\bar{X}_t$  = grand mean of teachers with NCE and teachers with degree

**Research Question 2:** Which activity-based instructional strategies could improve students' mastery of practical skills in Blocklaying, Bricklaying and

Concreting in Gombe State technical colleges?

Table 2 shows the summary of data collected on the activity-based instructional strategies that can improve



Blocklaying, Bricklaying and Concreting students' practical skills in technical colleges in Gombe State. The summary of the data as presented on Table 6 revealed that a total of 11 strategies for improving practical skills competencies identified from various literature were presented to the respondents to evaluate their relevance/adequacy. All these items, with the exception of item 5, were accepted as relevant/adequate strategies for the improvement of students' acquisition of practical skills in BBC trades by teachers.

Items 3, 5 and 6 however, indicate divergent degrees of agreement between practical skills in BBC trades by teachers. Items 3, 5 and 6 however, practical skills in BBC trades by teachers.

Items 3, 5 and 6 however, indicate divergent degrees of agreement between the two categories of respondents. Item 8 stand out as the highest accepted with a 4.16 mean responses. All the other accepted items scored between 3.14 (item 6) and 3.95 (item 7) in their group means.

The standard deviation for all the items showed close but different ranges of group cluster. Apart from items 2 and 5 having standard deviations above 1.00 (i.e. 1.03 and 1.03), all other items have standard deviations below 1.00. Based on these data so far presented, it is safe to conclude that all the accepted strategies are important for the development of students' skills in BBC practical work.

**Table 2:** Mean Responses on Activity-based instructional strategies that can Improve Students' Mastery of Practical skills in Blocklaying, Bricklaying and Concreting in Technical Colleges in Gombe State (N1=22, N2=19)

No	Activity-based instructional	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_t$	$\delta$	Remarks
1	Allowing students to engage themselves in practicing what they learned from practical	3.05	3.36	3.21	0.36	Disagree
2	Using well equipped and organized workshop for practical	3.05	4.55	3.80	1.03	Agree
3	Grouping students into small groups during practical	3.68	2.64	3.16	0.63	Disagree
4	Always inviting building experts from building industries to give lectures to students on practical innovations	3.63	3.45	3.54	0.93	Agree
5	Allowing students to teach themselves the acquired practical skills after field trips	2.58	3.32	2.95	1.03	Disagree
6	Visiting relevant building industries for practical skill acquisition (field trip)	2.95	3.32	3.14	0.68	Disagree
7	Always teaching practical in a well-organized and equipped workshop	4.74	3.14	3.94	0.91	Agree
8	Making it compulsory for students to have their own basic hand tools for practical	4.63	3.68	4.16	0.99	Agree



9	Providing practical manuals to guide students during practical	3.26	4.00	3.63	0.69	Agree
10	Allowing students to handle basic Blocklaying, Bricklaying and Concreting tools during practical	3.16	4.23	3.70	0.59	Agree
11	Assigning more marks to practical than theory	3.53	3.73	3.63	0.84	Agree

Key: N1 = Number of teachers with NCE ; N2= Number of teachers with degree  $\bar{X}1$  = Mean of teachers with NCE,  $\bar{X}2$  = Mean of teachers with degree;  $\bar{X}1$  = Mean of responses of teachers with NCE;  $\bar{X}2$ = Mean of responses of teachers with degree;  $\bar{X}t$  = grand mean of teachers with NCE and teachers with degree

### FINDINGS AND DISCUSSION

The findings were analysed based on the two research questions. The activity-based teacher preparation for effective activity-based instruction in Blocklaying, Bricklaying and Concreting in technical colleges in Gombe State should include: choosing learning goals; Selecting appropriate activity types to form the learning experience; Identifying instructional methods that can improve on the mastery of practical skills; Selecting resources that will best help students to benefit from the learning experience.

Identifying instructional methods that can improve on the mastery of practical skills; Selecting resources that will best help students to benefit from the learning experience and Identifying what skills the students already have for the task ahead.

The findings of this study revealed that fifteen teacher preparation activities are important for effective activity-based instruction in Blocklaying, Bricklaying and Concreting in technical colleges in Gombe State. These include: Choosing learning goals; Selecting resources that will best help students to benefit from the learning experience; Identifying what skills the students already have for the task ahead; Identifying strategies by which the students will

actively participate and hence learn the skill Preparing students to develop conscious control over tools for learning the task; Planning on reviewing previous sessions; Planning to draw from previous knowledge of the students using diverse technique; Identifying the right activity-based instructional strategies by which mastery of skills will be assessed; Preparing for possible questions from students to be able to meet their needs and Considering the students' strengths in mastery of the practical skill.

The findings of this study revealed that ten strategies could be used to effectively utilize activity-based instruction that can improve practical skills of BBC students in technical colleges of Gombe State. These strategies include the following: Allowing students to engage themselves in practicing what they learned from practical; Using well equipped and organized workshop for practical; Grouping students into small groups during practical; Always inviting building experts from building industries to give lectures to students; on practical innovations;

In addition to the above, it was also found out that teachers should always teach practical lessons in well-organized and equipped workshop; Visiting relevant building industries for practical skill acquisition (field trip); Making it compulsory for students to have their own





basic hand tools for practical; Providing practical manuals to guide students during practical; Allowing students to handle basic Blocklaying, Bricklaying and Concreting tools during practical; Assigning more marks to practical than theory teacher preparation activities are necessary for effective activity-based instruction in Blocklaying, Bricklaying and Concreting in technical colleges in Gombe State.

These findings were in agreement with the opinion of Festus (2013) that Activity-based learning is based on the core premise that learning should be based on doing some hands-on experiments and activities rather than just listening to lessons only. Similarly, it is the opinion of Joyce and Weil, in Engdasew (2013) that the student's construction and mastery of skills can become increasingly sophisticated and efficient if the teacher makes the student an insider to the learning process and that if a child is given opportunity to explore the learning environment by themselves and provided an optimum learning environment then learning becomes joyful and long lasting.

## CONCLUSION

Based on the findings of the study, proper teaching of BBC trades at Technical College level is all about helping the students to acquire skills in the relative trades for gainful employment and wealth creation. In order for students to acquire these skills, teachers may adopt activity-based instructional strategies in teaching teach relevant skills to students.

## RECOMMENDATION

1. Teachers should prepare themselves adequately to help improve their students' mastery of practical skills in BBC by putting a lot of things into consideration before even entering their classes.

2. They should be tactical in choosing the goals and objectives of the lessons as well as how best to achieve them. It is equally imperative for these teachers to understand their students' interests, strengths and weaknesses as they should be able know other variables that differentiate their students as regards to their learning styles and capabilities

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