



Practical Skills Required for Sustainability of Technical College Students in Brick/Block Laying Trade

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Received 08 August 2023; Accepted 07 November 2023; Available online 15 May 2024

Abstract: This study was conducted to assess practical skills required for sustainability of technical college students in brick/block laying trade. Two research questions were developed in relation to what the study sought to find out. Practical Skills in Brick Laying Questionnaire (PSBQ) containing 26 items was developed and used for data collection while 3 experts were engaged to face validate the instrument. The reliability coefficient of the instrument was found to be 0.74 using Cronbach Alpha Coefficient. The PSBQ was used for collecting data from 103 respondents made of building technology teachers in technical colleges and registered building technicians in Ekiti State. The data collected were analyzed using descriptive statistics of mean and standard deviation to answer the research questions. The study found that 15 practical skills highlighted in the use of tools and equipment for brick/block laying are required for relevant job placement. Also, 11 practical skills highlighted in the construction of simple brick/block walls are required for relevant job placement. The study recommended among others that building technology teachers should be up-to-date and abreast of recent technological changes and innovations in building industries.

Keywords: Practical Skills, Sustainability, Technical College, Brick/Block Laying

1. Introduction

Vocational and Technical Education (VTE) programmes are meant to equip individuals with the necessary knowledge, attitude and skill for self-reliance, hence the programmes are offered at different levels of education to produce different categories of manpower. The Federal Government of Nigeria (FRN, 2004) identified universities, polytechnics, colleges of education and technical colleges as institutions that offer TVE programme. Each of these institutions prepares different categories of manpower. One critical stage is the technical college where the low-level manpower is prepared.

Technical colleges are TVET institutions where recipients are exposed to skill-based programmes targeted towards acquiring relevant knowledge and skills in different trades for self-reliance, and employment in the world of work (Olakotan, 2021). Technical colleges as training institutions enable students to acquire relevant and adequate knowledge, skills and attitude for employment in various occupations under the tutelage of qualified teachers (Nwachukwu, Bakare & Jika, 2011). Technical colleges provide students with thorough training with the relevant and adequate knowledge, skills and attitude for employment under the guidance of a teacher in related occupations. In other words, the teacher trains the technicians and craftsmen in the technical college in different occupational areas to acquire the skills that will enable them to become self-employed in the world of work. In a similar vein, Ede, Miller & Bakare (2010), identified that students in technical colleges are trained in auto-mechanics, woodwork, plumbing, electrical, building, maintenance and electronic technology. This explains that graduates of technical colleges are expected to major in a particular occupational area.

The various occupational areas obtainable in technical colleges are so relevant that their services are needed in every human endeavor, however, the emphasis on this study is building technology. According to Ezeji (2000), building technology in technical colleges expose students to different skilled areas such as concreting, foundation, brick/block making, plumbing, finishing, site management, surveying and architectural works. Anaele (2005), therefore affirmed that one fundamental skilled area in building technology is brick/block laying tasks, because in modern times, any building without bricks or block will not stand the test of times. The researcher therefore suggested that these skilled areas can continually place students on the job since all other skilled areas of building technology ends with bricks/blocks. Since

brick/block laying is a fundamental skill in building technology, its contents in technical college should enable students to have basic knowledge in concreting and foundation and is also what makes a building have its shape.

Skills refer to overt qualities demonstrated in technical and practical abilities to solve cogent problems that are beneficial to society (Oke & Olakotan, 2017). A skill is a learned ability to carry out a task with pre-determined results often within a given amount of time, energy, or both (Ogbuanya & Ohanu, 2010). Lemo and Olakotan (2016) noted that skill acquisition is preeminently the cultivation of overt employable skills which tends towards self-reliance in different kinds of occupation and that skill acquisition cannot in anyway be hidden in its recipient, it has to be displayed through manual dexterity and physical habits in manipulating objects for various use and purposes. This means that having the required practical skills in brick/block laying tasks will attract the attention of people on technical college graduate, which will in turn place them on relevant jobs. There are different types of skills; these include basic skills, generic skills, cognitive skills, manipulative skills, practical skills and technical skills. Since more emphasis is placed on practical skills in technical colleges, practical skill is considered in this study.

Practical skills are usually obtained through experimenting, designing, constructing, testing, carrying out repairs and performing general workshop/ laboratory tasks. According to Centre for Inclusive Learning Support, CILS (2012), having practical skills means being able to use what you have learnt in the classroom in real life situations and in works. In the context of this study, practical skills in brick/block laying have to do with all the competencies involved in brick/block laying, as should be learnt from the classroom and required of a technical college graduate to perform a related task effectively in the world of work. These skills include the use of tools and equipment for brick/block laying, design and construction of simple bricks and block walls, laying of kerbs and surfaces and construction of decorative fixtures on the openings of buildings among others.

In recent times, it has been observed that modern buildings have continued to emerge with complex and sophisticated designs in block/brick laying, hence the need to identify the areas of improvement in block/bricklaying that are necessary for the teaching of practical skills so that its recipient will graduate with work-based skills in block/brick laying. In addition, the contraction of building construction seems to be limited, in that some experts continually gain the job. It is therefore necessary that the skills needed from a technical college graduate in block/brick laying in modern building technology be identified for sustainability.

Sustainability in the context of this study refers to making training of students relevant to the needs of the society (Olakotan & Yisa, 2018).

Generally, practical skills in block/brick laying as taught in technical colleges may not be sustainable, since there have been challenges in equipping technical colleges in order to produce graduates that will meet the present demands in building construction.

The goals of VTE are to provide trained manpower in the applied sciences, technology and business particularly at the craft, advanced craft and technical level. In pursuance of these goals, it is the policy of the Federal Government of Nigeria to encourage men and women equally, of all ethnic, racial, and economic background to acquire skills in science, technology and mathematics and to have equal opportunity in education, training and employment in scientific and technology fields and thereby promoting scientific literacy and technology. The expectation is that during laboratory activities, students are provided with experiences predisposing towards acquisition of technical process skills needed for the translation of ideas or instructions into a practical form. Building technology is one of the essential areas with brick/block laying as a trade taught in this area at technical colleges. In addition, students of building technology must be able to measure the right proportion and mix mortars manually with a shovel or spade and mortar box, tuck a mortar board or pan, temper mortar, layout building lines, square corners with a 2' framing square, determine coursing using a modular/brick spacing rule, plumb and level with mason's 2' and 4' levels, chalk a line, carry brick with tongs, spread mortar for brick, butter head joints for brick, dry bond brick, lay brick to a line while holding bond, lay closure brick, finish joints with a variety of masonry tools, demonstrate a safe work environment according to best practices in the masonry industry and Occupational Safety and Health Administration (OSHA) standards.

It seems that in spite of the curriculum which is supposed to give students the required skill when taught, the students seem to lack the necessary skill in brick/block laying that will enable them to get employed in the modern building construction industries, (Okoro, 1999, Shodeinde, 2013). In addition, technical college graduates are apparently unable to withstand the competition in building construction currently obtainable in the world of work because it seems that there exists a gap between what is taught in the classroom and what goes on in the world of work. If educational institutions, technical colleges inclusive, continually teach the trends and the shifts in the world of work, the issue of low-level skill acquisition and unemployment among building technology graduates would reduce drastically.

In a study of the reappraisal of the work skill requirements for technical colleges in Nigeria, Odu (2009) provides out a justification for the introduction of building technology trade in technical colleges. The author says that in order to improve the pace of Nigeria's technological development, students should be made to acquire relevant knowledge, skills and desirable work habits. They need to understand and manipulate processes and materials. Consequently, a curriculum is needed to facilitate the acquisition of such skills and knowledge in Building Construction so that they may gain employment in related industries, be self-employed or pursue higher technological education.

1. Methodology

This study adopted a descriptive survey research design. According to Gall, Gall & Borg (2007) a survey is a method of data collection using questionnaires or interviews to collect data from a sample that has been selected to represent a population to which the findings of the data analysis can be generalized.

The population for this study consisted of 103 respondents. No sampling techniques was used because the population is manageable.

A self-developed instrument entitled “Practical Skills in Brick Laying Questionnaire (PSBQ)” was used for the study. The PSBQ containing 26 items was based on an adapted Likert Scale rating of: Highly Required (HR) – 4, Required (R) – 3, Partially Required (PR)-2 and Not Required (NR) -1. The face and content validation of the instrument was ascertained by three experts, while the reliability of the instrument was ensured using Cronbach Alpha and a coefficient of 0.74 was obtained.

Mean and standard deviation were used to answer the research question raised in the study. Any item with a Mean rating of 2.50 or above was regarded as required, while any item with a Mean rating less than 2.50 was regarded as not required.

2. Results and Discussion

1.1 Research Question 1

What are the practical skills in the use of tools and equipment for brick/block laying required of graduates of technical colleges?

To answer research question one, mean and standard deviation were used. The result of the computation is as presented in table 1.

Table 1: Practical Skills Required in the Use of Tools & Equipment

| S/N | ITEM STATEMENT | X | SD | REMARKS |
|-----|-------------------------------------|------|------|----------|
| A | Bricklaying Tools | | | |
| 1 | Ability to identify and use trowel | 3.91 | 0.19 | Required |
| 2. | Ability to use spirit level | 3.57 | 0.09 | Required |
| 3. | basic principles of lines and pins | 3.75 | 0.59 | Required |
| 4. | Use of club hammer | 3.53 | 0.22 | Required |
| 5. | basic principles of tape measure | 3.72 | 0.13 | Required |
| 6. | Use of brick hammer | 3.60 | 0.10 | Required |
| 7. | Use of jointer | 3.56 | 0.52 | Required |
| 8. | Principles and method of chiselling | 3.69 | 0.71 | Required |
| 9. | Use of head pan | 3.78 | 0.56 | Required |
| 10. | Use of spade | 3.70 | 0.56 | Required |
| 11. | Ability to use digger | 3.96 | 0.67 | Required |
| B | Brick laying Equipment | | | |
| 12. | Ability to use wheelbarrow | 3.98 | 0.58 | Required |
| 13. | Basic principles of theodolite | 3.95 | 0.78 | Required |
| 14. | Basic principles of cement mixer | 3.58 | 0.12 | Required |
| 15. | Use of vibrator | 3.91 | 0.19 | Required |

The data presented in table 1 revealed that all the 15 items had their mean values ranged from 3.56 – 3.98. This indicated that all the items are practical skills required in the use of tools and equipment.

1.2 Research Question 2

What are the practical skills in the construction of simple brick/block walls required of graduates of technical colleges? To answer research question two, mean and standard deviation were used. The result of the computation is as presented in Table 2.

Table 2: Practical Skills Required in the Construction of Simple Brick/Block Walls.

| S/N | ITEM STATEMENT | X | SD | REMARKS |
|-----|---|------|------|----------|
| 16. | Interpret and apply symbols, and conventions and other standard practices in building drawing | 3.78 | 0.11 | Required |
| 17. | Demonstrate knowledge of making trench | 3.97 | 0.74 | Required |
| 18. | Demonstrate knowledge of timbering to trenches | 3.91 | 0.56 | Required |
| 19. | Ability to scoop mortar with a trowel | 3.89 | 0.74 | Required |
| 20. | Ability to lay the mortar down an inch thick and a few inches wide | 3.78 | 0.11 | Required |
| 21. | Setting a brick down on top of the mortar | 3.50 | 0.21 | Required |
| 22. | Tapping the brick into position to line up correctly | 3.67 | 0.42 | Required |
| 23. | Ability to use spirit level to check for alignment | 3.53 | 0.22 | Required |
| 24. | Using trowel to scrape away excess mortar from the joint | 3.78 | 0.11 | Required |
| 25. | Placing the next brick in the same manner | 3.78 | 0.11 | Required |
| 26. | Smoothing the mortar joint | 3.97 | 0.74 | Required |

The data presented in table 3 revealed that all the 11 items had their mean values ranged from 3.50 – 3.97. This indicated that all the items are practical skills required in the construction of simple brick works.

3. Discussions

The ultimate goal for graduates from technical colleges is the acquisition of skills and competencies that will enable them to be self-reliant and contribute to national development.

In research question one, the findings as shown in Table 1 revealed that highlighted practical skills in the use of tools and equipment for brick/block laying are required. The findings are corroborated with that of UNESCO-Nigeria Technical & Vocational Education Revitalisation Project-Phase II, National Diploma in Building Technology (2008), noting that bricklaying and concreting processes consist of many operations and require the use of many tools and equipment. They both require batching and mixing of concrete and mortar, transportation of the mix to the required point of use placing the mix at the desired position, positioning the bricks/block in the correct positions, and aligning them correctly. The type and choice of the tools and equipment depends on the operation to be carried out. Similarly, Lynch, Watt and Colston (nd) informed that are a range of tools for making bricks would have included, hand-saws, drags, and chisels as well as abrasives like hand stones, rasps, files and rifflers, trowels, hammers, and spirit level among others. In research question two, the findings as shown in Table 2 revealed the practical skills in the construction of simple brick/block walls. The findings correlate with the opinions of Basic Brick Construction (BBC) (2006) noting that the best way to learn the art of bricklaying is through hands-on experience, and there's no better place to start than with a basic freestanding brick wall and also that Interpreting and applying symbols, and conventions and other standard practices in building drawing, demonstrating knowledge of making trench, timbering to trenches and ability to scoop mortar with a trowel among others are all practical skills required for job placement in the world of work

4. Conclusions

This study has practical skills required for sustainability of technical college students in brick/block laying trade. The study identified practical skills in the use of tools and equipment for brick/block laying as well as practical skills in the construction of simple brick/block walls, practical skills in the laying of kerbs.

These findings represent the opinions of building technology teachers and registered building technicians who oversee teaching and learning processes and job placement as the case may be.

Based on the findings of the study, it was recommended that Building technology teachers should be up-to-date and abreast of recent technological changes and innovations in building industries and that the highlighted practical skills should be rightly inculcated in the students while still in the learning process, in order to be self-reliant and useful to the world of work in general.

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