Improvement Needs in Setting Out and Foundation Skills Among Bricklaying, Blocklaying, And Concreting Teachers for Enhanced Practical Skills Acquisition in Adamawa State, Nigeria

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ABSTRACT

The study investigated the setting out and foundation skills improvement needs of Bricklaying, Blocklaying and Concreting (BBC) teachers for enhanced practical skills acquisition in Government Science and Technical Colleges in Adamawa State, Nigeria. The study adopted a descriptive survey research design. The population comprised 34 BBC teachers and 13 workshop technicians drawn from four Government Science and Technical Colleges in Adamawa State, giving a total of 47 respondents. Census sampling technique was employed since the population was manageable. A structured questionnaire titled Construction Skills Improvement Needs of BBC Teachers Questionnaire (CSINBBCTQ) was used for data collection. The instrument was validated by three experts and had a Cronbach Alpha reliability coefficient of 0.84. Data were analyzed using the mean and standard deviation for the research questions, while the independent samples t-test was used to test the hypotheses at a 0.05 level of significance. Findings revealed that BBC teachers expressed a highly needed level of improvement in setting out skills (grand mean = 3.50) and foundation skills (grand mean = 3.62). No statistically significant differences were found between the mean responses of BBC teachers and workshop technicians on both skill domains ($p = 0.232$ and $p = 0.988$, respectively). It was concluded that BBC teachers in Adamawa State require substantial upskilling in setting out and foundation competencies to enhance their instructional delivery. The study recommends regular in-service training and industry-college partnerships to bridge identified skill gaps.

Keywords: Skill improvement needs, setting out skills, foundation skills, BBC teachers, technical colleges, practical skills acquisition, Adamawa State

INTRODUCTION

Technical and Vocational Education and Training (TVET) occupies a central position in any nation's drive toward skilled manpower development and economic self-sufficiency. In Nigeria, the Federal Republic of Nigeria (FRN, 2013) defines technical education as the form of education obtainable at Science and Technical Colleges, providing students with the knowledge and skills required for gainful employment in related occupations. Government Science and Technical Colleges (GSTCs) are the principal institutions through which this mandate is carried out, training students in construction trades, engineering, and various other vocational areas. Among the trade areas offered at these colleges, Bricklaying, Blocklaying and Concreting (BBC) holds a strategic significance because it directly supplies the construction industry with skilled operatives who are foundational to infrastructure development (Okafor, 2013).

Practical skills acquisition is the defining objective of BBC training. Effective learning in the BBC trade requires students to engage actively with real tools, materials, and construction scenarios, progressing from known to unknown concepts and from simple to complex tasks (Murkatik et al., 2020). This psychomotor emphasis demands that teachers themselves possess reliable, demonstrable, and current technical competencies. A teacher who cannot demonstrate accurate setting out or sound foundation construction cannot effectively transfer such

competencies to students. As Nwosu (2013) emphasized, teaching in the BBC trade is only effective when teachers possess both theoretical knowledge and practical skills. Where teacher competence is lacking, students lose confidence in the instruction they receive, and learning outcomes are compromised (Mazana et al., 2020).

The concept of skill improvement needs refers to the gap between the skills a professional currently possesses and the skills required to perform their duties effectively and in line with current industry standards. Manna et al. (2016) defined needs as the difference between current and desired results, that is, the gap between what is and what ought to be. For BBC teachers, skill improvement needs encompass all areas of technical and pedagogical competence where upskilling, retraining, or professional development is required to enable them to teach effectively. Isaac (2016) further described skill improvement needs as the process of strengthening and equipping individuals with content knowledge, skills, and access to training that will enhance their planning and performance. The need for continuous skill improvement among technical teachers is recognized in national education policy, which stresses that regular training and retraining are essential for teachers to keep pace with technological change and industry expectations (FRN, 2013).

Among the key technical competency areas in BBC training, setting out and foundation skills occupy a particularly fundamental position. Setting out is the critical first activity in every construction project. It involves the accurate transfer of building dimensions from drawings to the physical site, establishing building corners, determining levels, and ensuring that all structural elements are positioned correctly before construction begins. Tukur and Gwarzo (2021) conducted a comparative study of building setting out and foundation skills acquired by NCE students in North West Nigeria and found significant gaps in teachers' proficiency in both areas. Setting out errors committed by teachers during instruction directly mislead students and breed substandard construction practices. The rapid advancement of construction technology has introduced sophisticated instruments, including total stations, GPS/GNSS systems, laser levels, and Building Information Modeling (BIM) tools, which BBC teachers must master to remain relevant to industry demands (Macedo & Ferreira, 2023). Teachers who cannot demonstrate the effective use of these modern instruments and technologies may be unable to adequately equip students with the practical competencies required by contemporary construction employers. Consequently, continuous improvement of teachers' setting-out skills is essential for ensuring that students acquire accurate, relevant, and industry-oriented construction competencies

Foundation skills are equally critical because the foundation is the structural base upon which the stability and durability of any building depends. BBC teachers must guide students in identifying appropriate soil types, selecting suitable foundation types, supervising excavation, placing reinforcements, and ensuring proper compaction and concrete placement (Adebayo & Oladimeji, 2021). Deficiencies in foundation skills among teachers translate directly into poor instructional outcomes, leaving students ill-prepared for fieldwork and contributing to the persistent problem of building collapse in Nigeria. Eze and Ogbu (2016) argued that foundation competence is central to structural stability, while Okwori (2020) warned that inadequate foundation expertise compromises both instruction quality and safety outcomes.

The need for continuous professional development and retraining among BBC teachers is widely acknowledged in the literature. Onah (2019) found that training and retraining programs significantly improve teachers' skills and their ability to carry out instructional duties effectively. Ekpulu and Ogoun (2022) stressed that without continuous training and retraining for knowledge and skills updates, professional obsolescence is inevitable. Despite these insights, BBC teachers in Adamawa State continue to face limited access to structured professional development opportunities, outdated instructional methods, and insufficient mastery of current construction practices (Nwosu, 2013). This study therefore investigated the setting out and foundation skills improvement needs of BBC teachers in Government Science and Technical Colleges in Adamawa State, Nigeria.

Bricklaying, Blocklaying and Concreting teachers in Government Science and Technical Colleges are expected to produce graduates who are practically competent and industry-ready. However, the inability of technical college teachers to impart the necessary skills to students has contributed to high levels of graduate unemployment in the construction sector (Hanapi et al., 2014). Kumari (2022) observed that many BBC teachers fail to keep their knowledge and skills current through periodic retraining and capacity building, resulting in a

high probability that students will not acquire the relevant skills needed for competence and adaptability in a world of modern technologies.

Instructional delivery in Adamawa State faces particular challenges across critical areas such as setting out and foundation construction. Many BBC teachers demonstrate limited proficiency in modern setting out instruments and current foundation techniques, resulting in outdated instructional demonstrations that fail to prepare students for real-world construction tasks. Poor practical exposure of students, often compounded by inadequately equipped workshops and teachers with limited site experience, deepens the competency gap between what students learn and what the construction industry demands (Tika et al., 2021).

The consequences of this gap are substantial. In Adamawa State, concerns exist regarding the practical competencies acquired by students graduating from Government Science and Technical Colleges, particularly in Bricklaying, Blocklaying and Concreting (BBC). Some graduates appear inadequately prepared for employment and entrepreneurship, raising concerns among parents who expect technical education to equip their children with relevant employable and entrepreneurial skills. Similarly, the construction industry requires competent workers who can perform essential tasks, including setting out and foundation construction, accurately and safely.

One possible contributing factor is the practical competence of BBC teachers, whose ability to demonstrate current construction techniques and provide effective practical instruction may be affected by limited professional development, inadequate equipment, and insufficient exposure to modern construction practices. However, there is limited empirical evidence identifying the specific setting-out and foundation skill improvement needs of BBC teachers in Adamawa State. Therefore, this study seeks to determine these needs to provide a basis for targeted teacher training and improved practical instruction, thereby enhancing students' employability and entrepreneurial potential

Statement of the Problem

Bricklaying, Blocklaying, and Concreting (BBC) teachers in Science and Technical Colleges play a vital role in equipping students with the practical and technical skills needed for the construction industry. However, the inability of Technical College teachers to impart the necessary skills to students has contributed to the high level of unemployment in the country (Usman, 2012). For students of Blocklaying, Bricklaying and Concreting to acquire the required skills, teachers must possess reliable knowledge and skills to impart these skills to the learners. Also, Nwamaka and Mbah (2019) asserted that BBC teachers do not keep their knowledge and skills up to date through periodic retraining and capacity building. This indicates that there is a high probability that students of Blocklaying, Bricklaying and Concreting in Technical Colleges will not acquire relevant skills for competence and adaptability in the world of modern technologies if the teachers do not possess the required skills. Onah (2019), highlighted the significant gap between the instructional skills of BBC teachers and the requirements of modern construction practices. This gap has led to poor student outcomes, with many graduates lacking the competencies necessary to meet industry demands or establish their own businesses.

Instructional delivery in Adamawa State faces challenges in several critical areas, including foundational skills, finishing techniques, technical drawing, and safety practices. Furthermore, these teachers often lack exposure to current technologies and modern pedagogical strategies, resulting in outdated instructional methods that fail to engage students or prepare them for real-world construction tasks.

The consequences of this problem are far-reaching. Students are graduating without the requisite skills for employment or entrepreneurship, leading to high unemployment rates among technical graduates. Additionally, the construction industry in Adamawa State is facing a shortage of skilled workers, which undermines the sector's ability to contribute to economic development. If this trend continues, the objectives of vocational education to produce skilled, employable graduates will remain unachieved, further widening the gap between education and the labor market. Despite these challenges, there has been little systematic effort to identify and address the specific skill deficiencies of BBC teachers in the region.

This study seeks to address this pressing issue by assessing the skill improvement needs of BBC teachers in Adamawa State. The findings will provide a basis for designing professional development programs aimed at enhancing their instructional delivery, thereby improving student outcomes and bridging the gap between vocational education and industry demands.

Purpose of the Study

The study was specifically designed to:

1. Determine the setting out skill improvement needs of BBC teachers for improved practical skills acquisition in Government Science and Technical Colleges in Adamawa State, Nigeria.

2. Determine the foundation skill improvement needs of BBC teachers for improved practical skills acquisition in Government Science and Technical Colleges in Adamawa State, Nigeria.

Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance:

$H0_1$: There is no significant difference in the mean responses of BBC teachers and workshop technicians on the setting-out skill improvement needs of BBC teachers for improved practical skills acquisition in Government Science and Technical Colleges in Adamawa State, Nigeria.

$H0_2$: There is no significant difference in the mean responses of BBC teachers and workshop technicians on the foundation skill improvement needs of BBC teachers for improved practical skills acquisition in Government Science and Technical Colleges in Adamawa State, Nigeria.

METHODOLOGY

Area of the Study

The study was conducted in Adamawa State, located in the North-East geopolitical zone of Nigeria, lying between latitude 7 degrees to 11 degrees N and longitude 11 degrees to 14 degrees E. The state has four Government Science and Technical Colleges (GSTCs), namely GSTC Yola, GSTC Numan, GSTC Mubi, and the Federal Science and Technical College Michika, all of which offer the BBC trade. These institutions serve as the primary centers for practical skills development in construction trades in the state and were therefore selected as the study area.

Research Design

The study adopted a descriptive survey research design. According to Nworgu (2015), a descriptive survey investigates existing conditions by collecting and analyzing data from a group of people without manipulation of variables. This design was considered most appropriate because the study sought to determine the actual skill improvement needs of BBC teachers based on their current practices and experiences, without interfering with existing instructional conditions.

Population

The population of the study comprised 34 BBC teachers and 13 workshop technicians in the four Government Science and Technical Colleges in Adamawa State, Nigeria, totaling 47 respondents as at the 2023/2024 academic session.

Sample and Sampling Technique

Census sampling technique was employed for the study. The entire population of 47 respondents was used because of the manageable size of the population.

Instrument for Data Collection

The instrument used for data collection was a structured questionnaire developed by the researcher and titled Construction Skills Improvement Needs of BBC Teachers Questionnaire (CSINBBCTQ). The questionnaire was organized into two sections. Section A gathered personal and professional background information of respondents, while Section B contained the skill items for the two focal areas covered in this paper: setting out skills (15 items) and foundation skills (15 items). A four-point rating scale was used: Highly Needed (HN = 4), Needed (N = 3), Barely Needed (BN = 2), and Not Needed (NN = 1).

Validation of Instrument

The instrument was subjected to face validation by three experts from the Department of Technology Education, Modibbo Adama University, Yola. The experts assessed the instrument for clarity of wording, consistency of items, appropriateness of content, and overall representation of the skill areas. All recommended adjustments were incorporated to enhance the validity, readability, and effectiveness of the instrument.

Reliability of Instrument

A trial test was conducted on 15 respondents from Science and Technical College Jalingo, who were not part of the study population. Using Cronbach Alpha, a reliability coefficient of 0.84 was obtained after analyzing the data with SPSS version 23, indicating that the instrument was reliable for the study.

Method of Data Collection

The instrument was distributed to respondents by the researcher and four trained research assistants, one for each of the science and technical colleges within the five respective educational zones in Adamawa State. Instruments were retrieved after completion by respondents and organized for analysis.

Method of Data Analysis

Data were analyzed using mean and standard deviation to address the research questions, while the independent samples t-test was used to test the hypotheses at the 0.05 level of significance, computed using SPSS version 23. The decision rule for research questions was based on a four-point rating scale: HN = 3.50 to 4.00; N = 2.50 to 3.49; BN = 1.50 to 2.49; NN = 0.50 to 1.49. For hypotheses, the null hypothesis was accepted when the p-value was greater than 0.05, and rejected otherwise.

RESULTS

Setting Out Skill Improvement Needs

Table 1: Mean and Standard Deviation on the Setting Out Skills Improvement Needs of BBC Teachers for Improved Practical Skills Acquisition (NT = 47) $N_T = 47$

S/N	ITEMS	$\bar{x}_T$	$\bar{x}_w$	$\bar{x}_G$	δ	Remark
1	Set out building foundations accurately	3.18	3.38	3.23	0.840	N
2	Measure site boundaries using total stations	3.44	2.69	3.23	0.813	N
3	Establish building corners and alignment	3.06	3.85	3.28	0.902	N
4	Calculate angles and distances in the setting out process	3.26	3.69	3.38	0.739	N
5	Use leveling instruments for accurate height measurement	3.62	3.77	3.66	0.668	HN

6	Use a theodolite instrument to check for squareness of wall angles	3.56	3.46	3.53	0.620	HN
7	Use digital levels for precise leveling tasks	3.35	3.38	3.36	0.673	N
8	Use laser distance meters for accurate measurements	3.24	3.15	3.21	0.657	N
9	Demonstrate effective techniques for setting out on sloped terrain	3.47	3.54	3.49	0.547	N
10	adopt software tools for setting out and measurement	3.79	3.92	3.83	0.433	HN
11	Perform checks and adjustments to ensure level foundations	3.79	3.62	3.74	0.441	HN
12	Apply trigonometric calculations for complex setting out scenarios	2.97	2.92	2.96	0.999	N
13	Utilize standard setting out procedures and best practices	3.44	3.62	3.49	0.718	N
14	Update and maintain setting out records for future reference	3.68	3.69	3.68	0.515	HN
15	Train on emergency correction techniques for setting out errors	3.47	3.54	3.49	0.547	N
	Grand Mean			**3.50**		**HN**

HN = Highly Needed, N = Needed, $\bar{x}_T$ = mean of Teachers = 34, $\bar{x}_w$ = mean of workshop technicians = 13, N_T= total number of respondents, $\bar{x}_G$ = Group mean, δ = Group Standard deviation.

The result in Table 1 presents the mean and standard deviation of the responses of BBC teachers and workshop technicians on setting out skill improvement needs. The group mean scores for items range from 2.96 to 3.83, indicating varying levels of perceived need across the skill items. Items rated as highly needed include adopting software tools for setting out and measurement ($\bar{x}_G$ = 3.83), performing checks and adjustments to ensure level foundations ($\bar{x}_G$ = 3.74), updating and maintaining setting out records ($\bar{x}_G$ = 3.68), using leveling instruments for accurate height measurement ($\bar{x}_G$ = 3.66), and using the theodolite instrument to check for wall angle squares ($\bar{x}_G$ = 3.53). Conversely, applying trigonometric calculations for complex setting out scenarios recorded the lowest group mean of 2.96, though it still falls within the needed category. The grand mean of 3.50 indicates that, on average, improvement in setting out skills is highly needed among BBC teachers to enhance their instructional delivery in Government Science and Technical Colleges in Adamawa State, Nigeria.

Foundation Skill Improvement Needs

Table 2: Mean and Standard Deviation on the Foundation Skills Improvement Needs of BBC Teachers for Improved Practical Skills Acquisition (NT = 47)

S/N	ITEMS	$\bar{x}_T$	$\bar{x}_w$	$\bar{x}_G$	δ	Remark
16	Identifying soil types for foundation construction	3.79	3.85	3.81	0.537	HN
17	Preparing a site for foundation work	3.74	3.85	3.77	0.476	HN
18	Setting out dimensions for foundations	3.50	3.54	3.51	0.547	HN
19	Selecting the appropriate type of foundation	3.79	3.85	3.81	0.537	HN
20	Compacting soil for foundation stability	3.44	3.31	3.40	0.681	N
21	Calculating dimensions for foundation trenches.	3.47	3.38	3.45	0.746	N
22	Assessing soil conditions before foundation work	3.65	3.46	3.60	0.614	HN
23	Addressing defects in foundations	3.71	3.77	3.72	0.579	HN
24	Ensuring safety during foundation construction	3.71	3.54	3.66	0.562	HN
25	Explaining foundation construction steps to students	3.38	3.54	3.43	0.617	N
26	Interpreting construction drawings for foundations	3.71	3.69	3.70	0.587	HN
27	Placing reinforcements in foundations.	3.56	3.92	3.66	0.600	HN
28	Mixing concrete for foundation construction	3.41	3.62	3.47	0.620	N
29	Laying reinforcements for foundations.	3.71	3.46	3.64	0.605	HN
30	Supervising excavation for foundation work.	3.74	3.54	3.68	0.556	HN
	Grand Mean			**3.62**		**HN**

HN = Highly Needed, N = Needed, $\bar{x}_T$ = mean of Teachers = 34, $\bar{x}_w$ = mean of workshop technicians = 13, N_T= total number of respondents, $\bar{x}_G$ = Group mean, δ = Group Standard deviation.

The results in Table 2 present the mean and standard deviation of responses of BBC teachers and workshop technicians on foundation skill improvement needs. The group mean scores range from 3.40 to 3.81, reflecting a generally high level of perceived need for improvement across all foundation skill items. The highest-rated items are identifying soil types for foundation construction ($\bar{x}_G$ = 3.81), selecting the appropriate type of foundation ($\bar{x}_G$ = 3.81), preparing a site for foundation work ($\bar{x}_G$ = 3.77), and addressing defects in foundations ($\bar{x}_G$ = 3.72). These items underscore the priority placed on site assessment, material suitability, and remediation competencies by both groups of respondents. Items such as compacting soil for foundation stability ($\bar{x}_G$ = 3.40), explaining foundation construction steps to students ($\bar{x}_G$ = 3.43), and calculating dimensions for foundation trenches ($\bar{x}_G$ = 3.45) recorded comparatively lower mean scores, though they still fall within the needed category. The standard deviation values ranging from 0.476 to 0.746 suggest moderate variability in responses. The grand mean of 3.62 indicates that BBC teachers recognize a substantial and highly needed level of improvement in foundation skills to enhance their practical skills delivery in Government Science and Technical Colleges in Adamawa State, Nigeria.

Test of Hypotheses

$H0_1$: There is no significant difference in the mean responses of BBC teachers and workshop technicians on the setting out skill improvement needs of BBC teachers for improved practical skills acquisition in Government Science and Technical Colleges in Adamawa State, Nigeria.

Table 3: Independent Samples t-test on the Mean Responses of BBC Teachers and Workshop Technicians on the Setting Out Skill Improvement Needs of BBC Teachers for Improved Practical Skills Acquisition

Respondents	N	Mean	Std. Deviation	df	t-value	Sig. (p)	Decision
BBC Teachers	34	51.32	2.332	45	-1.210	0.232	Accepted
Workshop Technicians	13	52.23	2.204				

The result in Table 3 shows that BBC teachers recorded a mean score of 51.32 with a standard deviation of 2.332, while workshop technicians had a mean score of 52.23 with a standard deviation of 2.204. The calculated t-value of -1.210 with 45 degrees of freedom yielded a p-value of 0.232, which is greater than the 0.05 level of significance. Based on this result, the null hypothesis is accepted. There is no statistically significant difference between the mean responses of BBC teachers and workshop technicians regarding the setting out skill improvement needs of BBC teachers in Government Science and Technical Colleges in Adamawa State, Nigeria.

$H0_2$: There is no significant difference in the mean responses of BBC teachers and workshop technicians on the foundation skill improvement needs of BBC teachers for improved practical skills acquisition in Government Science and Technical Colleges in Adamawa State, Nigeria.

Table 4: Independent Samples t-test on the Mean Responses of BBC Teachers and Workshop Technicians on the Foundation Skill Improvement Needs of BBC Teachers for Improved Practical Skills Acquisition

Respondents	N	Mean	Std. Deviation	df	t-value	Sig. (p)	Decision
BBC Teachers	34	54.29	2.877	45	-0.015	0.988	Accepted
Workshop Technicians	13	54.31	2.250				

The result in Table 4 shows that BBC teachers recorded a mean score of 54.29 with a standard deviation of 2.877, while workshop technicians had a mean score of 54.31 with a standard deviation of 2.250. The independent samples t-test analysis yielded a calculated t-value of -0.015 with 45 degrees of freedom and a corresponding p-value of 0.988, which is greater than the 0.05 level of significance. The null hypothesis is

therefore accepted. There is no statistically significant difference between the mean responses of BBC teachers and workshop technicians regarding the foundation skill improvement needs of BBC teachers in Government Science and Technical Colleges in Adamawa State, Nigeria.

DISCUSSION OF FINDINGS

Setting Out Skill Improvement Needs

The findings of this study revealed that BBC teachers in Government Science and Technical Colleges in Adamawa State expressed a highly needed level of improvement in setting out skills, with a grand mean of 3.50. Specific areas of priority included the adoption of software tools for setting out and measurement, performing checks and adjustments to ensure level foundations, maintaining setting out records, and using leveling and theodolite instruments. These findings align with Tukur and Gwarzo (2021), whose comparative study of building setting out skills among NCE students in North West Nigeria found substantial gaps in the practical proficiency of construction educators in this area. Umar (2018) similarly noted that accuracy in setting out is fundamental to quality construction, yet many vocational teachers are inadequately trained in modern measurement techniques.

The priority placed on software tools and digital equipment reflects the broader technological shift occurring in the Nigerian construction industry. Macedo and Ferreira (2023) highlighted that tools such as total stations, GPS/GNSS systems, laser levels, and BIM platforms have become standard instruments on modern construction sites. BBC teachers who lack proficiency in these tools are unable to prepare students for industry demands, creating a competency gap that ultimately undermines students' employability. Kolawole (2019) corroborated this finding by arguing that digital competencies for setting out have now become core expectations for construction educators, not optional supplementary skills. The emphasis on record-keeping, which emerged as one of the highly needed items, is equally consistent with quality assurance requirements in modern construction management, where accurate documentation of setting out activities is essential for project control and accountability (Mishra et al., 2024).

The absence of a statistically significant difference between BBC teachers and workshop technicians on setting out skills ($p = 0.232$) indicates a shared perception of improvement needs across both groups. This consensus strengthens the validity of the findings and suggests that the skill gaps identified are collectively recognized within the technical education system in Adamawa State. Mormah and Bassey (2021) observed that vocational educators across Nigeria face parallel challenges in adopting technology-driven instructional methods, which supports the convergence of perceptions found in this study. From the perspective of Self-Determination Theory (Deci & Ryan, 2000), the observed gaps in setting out skills undermine teachers' sense of competence and professional autonomy. Strengthening these competencies through targeted in-service training would not only improve instructional delivery but also enhance teachers' intrinsic motivation and confidence in guiding students through complex construction tasks.

Foundation Skill Improvement Needs

The study further revealed that BBC teachers expressed a highly needed level of improvement in foundation skills, with a grand mean of 3.62, the highest among the two focal skill areas examined in this paper. The highest-rated items included identifying soil types for foundation construction, selecting the appropriate type of foundation, preparing a site for foundation work, and supervising excavation. These findings affirm the critical importance of geotechnical and foundation competencies in construction education. Eze and Ogbu (2016) argued that such knowledge is central to structural stability, while Okwori (2020) found that inadequate foundation expertise among vocational teachers compromises both instruction quality and safety outcomes in construction training.

The high rating accorded to soil identification and foundation selection reflects the fact that foundation decisions are site-specific and require teachers to demonstrate contextual judgment, not merely procedural knowledge. Adebayo and Oladimeji (2021) stressed that teachers who are proficient in foundation skills are better positioned to guide students in applying theoretical principles to real-world scenarios, thereby bridging the gap between

classroom instruction and site practice. The finding that placing and laying reinforcements in foundations were also rated as highly needed is consistent with Ibrahim (2019), who highlighted the limited on-site experience of many vocational teachers and its direct impact on their ability to demonstrate reinforcement work effectively.

The accepted null hypothesis on foundation skills ($p = 0.988$) confirms that both BBC teachers and workshop technicians equally recognize the importance of foundation competencies and the need for improvement. This near-identical mean response between the two groups (54.29 and 54.31 respectively) is among the closest agreements found in the study, suggesting that foundation skills are universally valued and the need for improvement is deeply felt across all teaching stakeholders. Competency Improvement Study (2024) reported similar findings in South-South and South-East Nigeria, identifying foundation-related competencies as a uniformly prioritized area for teacher upskilling. Theoretically, the great improvement need expressed in foundation skills indicates a significant gap in teachers' sense of competence, one that Self-Determination Theory identifies as a critical barrier to effective instructional motivation and performance (Deci & Ryan, 2000). Addressing these gaps through structured professional development programs that include hands-on site experience and collaboration with construction industry partners is therefore essential for improving both teacher competence and student practical skill outcomes.

CONCLUSION

The findings of this study provide compelling evidence that Bricklaying, Blocklaying and Concreting teachers in Government Science and Technical Colleges in Adamawa State, Nigeria, require significant skill improvement in both setting out and foundation competencies. With means of 3.50 and 3.62, respectively, both skill domains were rated as highly needed for improvement by BBC teachers and workshop technicians alike. The absence of statistically significant differences between the two respondent groups across both skill areas further confirms that the identified gaps are collectively recognized within the technical education system. The results highlight a pressing need to strengthen teacher training and professional development through in-service programs, industry-college partnerships, and practical exposure to modern construction technologies and site practices. Improving BBC teachers' competencies in setting out and foundation skills will directly enhance the quality of practical skills instruction and better prepare students for employment and entrepreneurship in the construction industry.

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