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Training Techniques for Artisans to Improve Construction Project Performance in Edo State, Nigeria

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Abstract

The development process of any nation is shaped by the priority given to the development and effective utilization of human resources. The poor quality of labour in Edo state compared to other cities has resulted in clients importing workers from other cities to carry out some trades and skills on their projects. This study aims to evaluate Artisan training techniques for improving construction project performance in Edo State, Nigeria. To accomplish this goal, the factors militating against artisans' training and techniques for artisans to improve their performance were also evaluated. A survey research design was employed to gather data from professionals in the built environment within Edo State through the use of closed-ended questionnaires. Out of 162 questionnaires distributed, 108 were successfully retrieved and considered suitable for analysis. The data were analyzed using percentile and mean score methods. The results identified the primary challenges hindering the training of construction artisans as insufficient funding for training programs, ineffective training methods, and a lack of motivation. The study also revealed that apprenticeship programs, trade testing courses, sponsored training systems, apprenticeship and coaching, conference training, on-the-job training techniques, and new technology training are required to improve the productivity of artisans. As a result, it was recommended that the government increase support for technical and vocational institutions, as well as training and retraining construction workers, in order to improve their performance.

1. Introduction

The construction industry plays a crucial role in a nation's economy, serving as a foundation for socioeconomic development and growth (1). It is instrumental in creating urban infrastructure that drives human progress and advances civilization. For the Nigerian construction industry to effectively contribute to the economy, it requires skilled personnel, reliable consultants and contractors, as well as trained workers, including artisans (2). Artisans hold a vital position within the building construction sector (3), constituting a substantial portion of the workforce essential for the successful completion of construction projects (4).

Nigeria needs experienced labourers for various construction projects because of the country's expanding population and the resulting housing needs (5). Recently, the demand has exceeded the supply for artisans, including bricklayers, carpenters, plumbers, and painters (6). According to (7), Construction artisans in Nigeria currently receive less training than in the past, when they were traditionally trained through trade apprenticeships, vocational training centers, and technical colleges. There is a pressing need to implement professional, well-structured, and adequately funded training and retraining programs for artisans and craftspeople. Such initiatives are crucial for tackling issues related to labor costs and the quality of craftsmanship.

Nigeria's construction sector employs the most people and is the largest employer in the country. Additionally, the sector generates more than 50% of the nation's gross capital formation (8). Obiegbu (2) defines training as providing instruction and practice to an individual or individuals to raise them to a desirable standard of behaviour, efficiency or physical condition. The industry will repeatedly fall short of meeting the market's demands for an adaptable, innovative, and capable service unless an adequate supply of adequately trained people can be guaranteed (9). The industry is responsible for being a knowledgeable, forward-thinking employer because the needs of its workforce and customers are intertwined and must be met separately. The construction industry must invest heavily in training its tradespeople because training has increased project performance and productivity. As a result of this training, they will be forced to adapt to current events and technological advancements in the construction sector.

The construction sector is often criticized for resource wastage, inefficiency, failure to meet quality and quantity standards, and delays in project delivery (10). These shortcomings may partly stem from the workforce's underperformance, which could be attributed to employer negligence. According to (11), the industry's low morale highlights the need for employee motivation. He emphasized that businesses overlook the people who generate income and jobs in favor of focusing too much on profits. This might contribute to the disappointing performance of the sector. (11), who assessed the industry's performance, determined that the sector's poor performance was caused by its excessive fragmentation, individualism, and outmoded management. This has forced several contractors to be unable to complete work on schedule, delaying the project's completion (12).

The influence of artisans in the construction industry is evident in the quality of final outcomes, especially when skilled artisans are involved. According to (13), issues such as substandard work, poor quality, low productivity, project delays, cost overruns, high accident rates, ineffective work practices, and conflicts often stem from a lack of craftsmanship. Artisans play a pivotal role in the successful execution of construction projects. They are deeply involved in the technical aspects of construction and, at the managerial level, act as frontline supervisors, translating company policies into tangible outcomes to achieve organizational goals.

1.1 Artisans in the Construction Industry

An artisan is a skilled worker specializing in a particular craft or trade, such as a bricklayer, iron bender, or carpenter. The construction industry is inherently complex due to the involvement of various parties, including owners (clients), contractors, consultants, stakeholders, and regulators. Despite this complexity, the industry plays a crucial role in achieving social goals. It is one of the largest sectors and contributes nearly 100% to the GDP. A master craftsman and an apprentice enter into a legal agreement known as an apprenticeship through which the apprentice receives practical training for a specified work process while supervised by the master craftsman. This type of workplace education allows the apprentice to receive training while working.

According to (14), apprenticeship has long been a method for training young individuals in various trades and crafts, including agriculture, business, and catering. It was the primary form of training during the pre-colonial era. In traditional settings, this often involved working in professions such as farming, fishing, hunting, carpentry, painting, decorating, blacksmithing, catering, and making boats and mats. The apprenticeship system was deeply rooted in traditions, family history, and rituals, and was highly valued. Every male born into a family was expected to learn the family craft, making it easy to identify a young boy as part of a lineage known for its expertise in a particular trade.

During the colonial era, the primary objective of missionaries was to evangelize Africans, and they viewed literary education as sufficient for this purpose, as it was less costly compared to the expensive equipment needed for technical and agricultural training. According to (15), some mission schools offered bricklaying, farming, and carpentry as part of their curriculum. Still, students and parents did not take these skills seriously as a vital aspect of Western education. However, with the introduction of the 6.3.3.4 education system in 1982, there was a shift away from literary education, and vocational education became a central focus in the school curriculum. A roadside apprenticeship refers to an agreement between a roadside artisan and an apprentice, where the apprentice works at the artisan's shop for a set period, paying a fixed fee as outlined in the contract. The training workshop typically involves a master (skilled worker), a journeyman (semi-skilled worker), and an apprentice (unskilled worker). However, roadside apprenticeship has made significant economic growth in Nigeria possible. The informal system has become a crucial supplement since there are so many demands on the formal vocational

training system. In Nigeria, roadside small businesses have offered opportunities for young apprentices to receive training.

A key obstacle to the training of construction artisans is the limited availability of formal training opportunities (16).). Many potential artisans come from underprivileged backgrounds and cannot afford the cost of vocational education. Training centers are often located in urban areas, far from rural communities where many aspiring artisans live. This creates a barrier for those who otherwise benefit from structured training programs. Government support for artisan training programs needs to be increased. Many governments need to allocate adequate resources to vocational education and skills development. As a result, training institutions lack the necessary infrastructure, tools, and qualified instructors to provide quality education. Without proper investment, the training system remains underdeveloped and unable to meet the growing demand for skilled artisans in the construction industry (17).

The poor perception of vocational training discourages many young people from pursuing careers as construction artisans (18). In many societies, vocational education is viewed as inferior to academic education. Parents and educators often push students toward white-collar professions, leaving artisan trades undervalued. This cultural stigma reduces the number of individuals willing to enroll in artisan training programs. Rapid technological advancements in the construction industry also hinder artisan training. Many training programs need to update their curricula to include modern construction techniques and tools. As a result, artisans trained in outdated methods struggle to meet industry demands. The lack of on-the-job training opportunities is another significant challenge. Many construction companies need to prioritize the training and development of their workforce (19). Instead, they often rely on experienced artisans without investing in recruitment training. This limits the chances for aspiring artisans to gain practical experience, which is crucial for developing their skills and confidence. Economic instability in many countries also affects the training of construction artisans. In times of economic downturn, funding for vocational training programs is often one of the first areas to be cut. Moreover, individuals who might have considered artisan training may instead focus on immediate income-generating activities to support their families, leaving little time or resources for skill development. This hampers the growth of a skilled workforce in the construction sector.

1.2 Training Techniques for Artisans

The training methods used for artisans can significantly improve the performance of construction projects in Edo State, Nigeria. One effective technique is on-site training, where artisans learn directly at the construction site (20). This method allows them to gain practical experience with fundamental tools, materials, and equipment. It helps them understand site-specific issues and how to handle them. Artisans can apply what they learn by working on actual projects, making remembering new skills and techniques easier. Classroom training is another valuable technique where artisans receive formal education in construction safety, project planning, and quality control (21). This training helps them build a solid theoretical foundation, which they can apply to improve their work. Classroom sessions also allow artisans to discuss their challenges and get advice from experts or instructors. In the long term, this helps artisans develop problem-solving skills essential for handling construction tasks efficiently.

Workshops and seminars also benefit artisans by exposing them to new trends and techniques in construction. Professionals share the industry's best practices and emerging technologies in these sessions. Artisans learn about more efficient building methods, which improve productivity and quality on-site. Workshops encourage artisans to ask questions and collaborate with others, fostering a sense of teamwork. This network helps artisans gain insights into improving their work, which can enhance overall project performance.

Mentorship programs provide artisans with guidance from more experienced professionals. Artisans can learn advanced skills and refine their techniques by working closely with mentors. Mentorships create a support system where artisans can ask questions and learn from their mentors' experiences. This continuous learning helps artisans avoid common mistakes, work more efficiently, and develop leadership skills. In turn, it leads to better project outcomes and strengthens the construction workforce in Edo State. The training techniques can be summarized as:

- Apprenticeship programmes: Companies recognized as Experiential Training Workplaces offer a 4-year apprenticeship program for the training of artisans. A successful apprentice must complete theoretical instruction and practical training in the workplace under the supervision of a mentor and pass a phase test. This will help build and sharpen the skills of artisans (3).

- Organizing conferences and seminars: Conferences and seminars are ways in which people are made aware of the recent happenings in the built environment. Organizing conferences and seminars for artisans will adequately equip them for the recent developments and make them relevant (22). There is a need for artisans to upgrade their skills to stay relevant in the construction industry.

- Sponsored Training System: This kind of training is sponsored by public or private entities to improve the skills of artisans in the construction industry. The world is changing, and artisans need to be trained in the innovations in the construction industry.

- Apprenticeship and coaching: This is a kind of mentoring program in which an artisan learns some skills under the supervision of a senior artisan to acquire knowledge.

- On-the-job-training techniques: this is a scenario where an artisan becomes vast in a skill by engaging in that skill for a long time. The more consistent they are in the job, the better they are.

- Trade Testing Course: The trade test is the final summative assessment for people completing an artisan qualification for a listed trade. Individuals wanting to take a trade test must meet specific criteria the assessment body sets. They do some certification courses in which they are given certificates to show how vast they are in their chosen skills.

2. Methods

This study aims to identify and assess training techniques that can enhance the performance of artisans in construction projects in Edo State, with the goal of improving project efficiency. The research employed a survey design, using questionnaires as the primary data collection tool. The study evaluated both methods for improving artisans' performance and the factors hindering their training. Data were collected from professionals in the built environment in Edo State, including architects, quantity surveyors, engineers, and builders, through closed-ended questionnaires. A total of 162 questionnaires were distributed, with 108 returned and deemed suitable for analysis. The questionnaire used a 5-point Likert scale, where respondents rated their agreement from 5 (strongly agree) to 1 (strongly disagree). The collected data were analyzed and presented using tables, percentiles, and mean scores.

3. Results and Discussion

For this study, questionnaires were distributed to professionals in the built environment in Edo State, Nigeria. A total of 162 questionnaires were distributed, and 108 were returned and considered suitable for analysis, yielding a response rate of 67% from the target population. This response rate significantly exceeds the typical 20-30% range commonly observed in construction management studies, as noted by (4).

Table 1 *Background information of respondents*

Category	Frequency	Percentage
Size of organization		
Small	52	48.15
Medium	32	29.63
Large	24	22.22
Total	***108***	***100.00***
Years of operation of the company		
1-5 years	10	9.26
6-10 years	30	27.78
11-15 years	16	14.81
16-20 years	34	31.48
Over 20 years	18	16.67
Total	***108***	***100.00***
Discipline of Respondent		
Architect	24	22.22
Quantity surveyor	26	24.07
Engineer	38	35.19
Builder	20	18.52
Total	***108***	***100.00***
Academic qualification of respondent		
MSc	20	18.52

BSc/BTech	40	37.04
HND	48	44.44
Total	***108***	***100.00***
Professional qualification of Respondent		
Probationer	20	18.52
Corporate	80	74.07
Fellow	8	7.41
Total	***108***	***100.00***
Years of experience of respondents		
1-5 years	24	22.22
6-10 years	60	55.56
11-15 years	16	14.81
Above 15 years	8	7.41
Total	***108***	***100.00***

Table 1 shows the background information of the respondents. A more significant percentage of the respondents work in small and medium size organizations, while about 22.22 % work in large organizations. It further reveals that about 9.25% have about five years in operation, 27.77% have about 6-10 years in operation, 14.81% have been operating for 11-15 years, 31.48% have been in operation for 15 -20 years while 16.66% have been existing for more than 20 years. Of the total respondents, 22.22% of the respondents are architects, 24.07% are engineers, 35.19% are quantity surveyors, and 18.52% are builders, making them knowledgeable to give honest views on the research. All the respondents used for the survey have a minimum of HND qualification, and about 74% of the respondents are corporate members of their various professional bodies, making them qualified to give information on the subject matter. The result indicates that most organizations have been incorporated over two decades. Most respondents have more than five years of post-qualification experience, which shows that they have experience and that their information is reliable.

Table 2 *Factors militating against training of construction artisans*

Identified factors	Mean score	Rank
The government's negligence in the training of construction artisans	4.39	1
Lack of funds to organize such training	4.31	2
Use of the wrong training techniques in the training process	4.30	3
Non-availability of relevant human resources to handle such training	4.15	4
Lack of motivation on the part of the trainees to acquire more skills	3.63	5
Lack of encouragement and support by the construction industry	3.59	6
Lack of effective regulatory bodies for Nigerian construction artisans	3.56	7
The absence of relevant incentives that can boost the morale of artisans for training	3.30	8

Table 2 shows the factors militating against the training of construction artisans, Government's negligence in the training of construction artisans ranked 1st with a mean score of 4.39, Lack of fund to organize such training ranked 2nd with a mean score of 4.31, Use of the wrong training techniques in the training process ranked 3rd with a mean score of 4.30, Non – availability of relevant human resources to handle such training ranked 4th with

a mean score of 4.15, Lack of motivation on the part of the trainees to acquire more skills ranked 5th with a mean score of 3.63, Lack of encouragement and support by the construction industry ranked 6th with a mean score of 3.59, while Lack of effective regulatory bodies for the Nigerian construction artisans ranked 7th with a mean score of 3.56, and Absence of relevant incentive which can boost the morale of artisans for training ranked 8th with a mean score of 3.30.

Table 3 *Training techniques that can improve performance of artisans*

Identified Techniques	Mean score	Rank
Artisans' apprenticeship programmes	4.74	1
Trade Testing Course	4.70	2
Sponsored Training System	4.61	3
Apprenticeship and coaching	4.44	4
Organizing conferences and seminars	4.39	5
On-the-job-training techniques	3.90	6

Table 3 shows the training techniques that can improve the productivity of artisans, Artisans apprenticeship programmes ranked 1st with a mean score 4.74, Trade testing course ranked 2nd with a mean score of 4.70, sponsored training system ranked 3rd with a mean score of 4.61, apprenticeship and coaching ranked 4th with a mean score of 4.44. In contrast, Conference method ranked 5th with a mean score of 4.39, and On-the-job-training techniques ranked 6th with a mean score of 3.90. This is in line with the findings of (2).

4. Conclusion and Recommendations

Since artisans make up a more significant portion of the labor force in construction projects, it is necessary to provide adequate training to improve project performance. The latest techniques are taught to artisans during training, enhancing their performance and the efficiency of construction projects. A project is said to be successful if it satisfies the client's or end users' needs. Various training methods have been identified to increase the performance of artisans, including apprenticeship programs, trade testing courses, sponsored training systems, coaching, conferences and seminars, and on-the-job training. This will help boost artisans' performance and improve construction project performance. It is therefore recommended that:

i. The government should provide support to technical and vocational institutions to raise their standards and make these institutions more appealing to Nigerian construction artisans.
ii. Relevant trade associations, in partnership with the government, should work to ensure high standards by revising the curriculum and programs to meet industry needs and by establishing well-equipped vestibule schools.
iii. Strict regulations should be enforced regarding the registration of artisans in their respective trades.

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Conflict of Interest

The authors declare no conflict of interest regarding the paper's publication.

Author Contribution

The authors confirm their contribution to the paper as follows: ***study conception and design:*** *Authors AOI, CA;* ***data collection:*** *Authors AOI, CA, AEO;* ***analysis and interpretation of results:*** *Author AOI, CA, AEO;* ***draft manuscript preparation:*** *AOI, CA, AEO. All authors reviewed the results and approved the final version of the manuscript.*

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