

Impact of Craftsmen's Mode of Employment on Performance in Selected Construction Firms in Lagos State, Nigeria

^{1*}Akanni, P. O. ²Ikpo, I. J. and ³Oke, A. E.

¹Department of Building, Federal University of Technology, Akure, Ondo state, Nigeria.

²Department of Building, Obafemi Awolowo University, Ile-Ife, Nigeria.

³Department of Quantity Surveying, Federal University of Technology, Akure, Ondo state, Nigeria.

*Corresponding Author E-mail: poakanni@futa.edu.ng

Tel: 08060253009

Submitted on: 15/01/2022

Accepted on: 06/06/2022

Abstract

*The quest to improve productivity of workers and overall performance of construction projects has necessitated the need to examine various categories of workforce and their overall effect on project success. The study investigated construction employment with a view to evaluating their impact on the performance of craftsmen in selected construction firms. The categories of employed craftsmen considered were the permanent, casual, hiring and firing, short-term and part-time. Performance parameters considered were technical experience; workmanship quality; time; and accidents recorded on sites. The craftsmen were drawn from three main trades: bricklayers (blocklaying/bricklaying, concreting, plastering, flooring); carpentry (roofing, timber formworking and scaffolding) and iron fixing (steel work and iron bending). A pilot survey was conducted to determine performance variables through questionnaire administered on thirty (30) experts drawn from selected firms. The experts were: human resources managers; construction managers; site engineers; supervisors and foremen who are directly involved with the employment and work activities of the craftsmen. The study revealed an employment composition of 48% permanent craftsmen, 35% casual while 17% were other staff of the companies studied. The results of employment practices indicated that 55% of the companies used primary six with trade test and 21% used senior secondary school as qualifications for the employment of craftsmen while the remaining companies used other qualifications. With *p* values of .001 and .047 respectively, the crosstab analysis of the impact of employment categories on craftsmen's performance revealed that there were substantial correlations between casual employment and the frequency of accident and technical performance.*

Keywords: Construction Firm; Craftsmen; Employment; Impact; Performance.

Introduction

The construction sector has long been regarded as one of the most active and complex of all project-based industries, as well as one of the primary drivers of growth in most countries' economies. (Akanni *et al* 2015; Ofori, 2015; Haupt and Harinarain, 2016). The construction industry contributed 2.37 percent to Nigeria's Gross Domestic Product GDP, according to the National Bureau of Statistics (2019), implying that the construction industry has a role to play in the development of the country.

Aside from its contribution to the country's GDP, the industry is also a key source of employment, providing jobs to large numbers of unskilled and skilled workers. (Akanni *et al* 2014; Haupt and Harinarain, 2016; Yap *et al.* 2019). According to studies by Inuwa *et al.* (2019), Ofori (2015), and Yap *et al.* (2019), the construction industry in emerging economies has the potential to employ up to half of the labour force. As a result, its impact on the environment and nature, as well as on humanity would be significant. (Akanni *et al.* 2015; Haupt and Harinarain, 2016; Akanni, 2020). Examining the composition of the construction workforce, Wibowo and Sholeh (2015), Durdyev and Ismail (2016), and Akanni (2020), affirmed that skilled workers' who are referred to as craftsmen are key stakeholders for project actualisation. These studies noted that craftsmen are involved in the bulk of the physical work such that

their performance mostly during construction process contribute to the successful completion of a project to some extent.

Studies such as Olomolaiye *et al.* (1987); Olomolaiye and Ogunlana (1989); and Kalsum *et al.* (2010) attempted to assess the performance of craftsmen based on output as contribution to construction success. However, Noh and Hanifah (2017), came from another dimension that frequent accident involvement on site and time wastage are important contribution to construction success other than craftsmen's output performance. Rahim *et al.* (2016) and Zannah *et al.* (2017), also noted that lack of technical understanding of many skilled labour (craftsmen) has contributed to low performance achieved during construction process. Afolabi *et al.* (2018), equally noted that the performance of skilled labour in time and quality of workmanship with less re-work, contribute immensely to on-time construction completion. On the other hand, Inuwa *et al.* (2019) summarise their observation that craftsmen supervisor project management skills have tremendous positive effect on skilled labour's (craftsmen) performance in time, quality of workmanship, technical know-how and accident involvement which in turn contribute to construction project success.

Although construction workers generally constitute a good percentage of the workforce in developing countries (Haupt and Harinarain, 2016; Ofori, 2015; Zannah *et al.* 2017), Yap *et al.* (2019) remarked that skilled employees (craftsmen) do not see their jobs as particularly rewarding, and that working in the industry is viewed as a low-status occupation practically everywhere. The motion behind construction work being undervalued, according to Zannah *et al.* (2017), has more to do with the terms under which workers are recruited than the nature of the work itself. For example, Zannah *et al.* (2017) found that hiring construction workers on a project basis and then firing them after the project is completed (casual nature of employment) has been a source of concern, and Afolabi *et al.* (2018) found that it is also a source of concern in Nigeria, where many construction companies engage in labour-intensive construction operations.

In spite of the arguments from the past studies about the employment and performance of craftsmen contributing to successful construction process globally, attention has not been paid in Nigeria at investigating the impact of craftsmen employment category on their performance during construction process. Tangentially related studies such as Kalsum *et al.* (2010); Olomolaiye *et al.* (1987); Olomolaiye and Ogunlana, (1989) and more recently Afolabi *et al.* (2018), Ayegba and Agbo, (2015) and Inuwa *et al.*, (2019), conducted on craftsmen in the Nigerian construction industry failed to address this issue. This study therefore examines the mode of craftsmen's employment in selected construction firms in Lagos State, Nigeria with a view to determining the impact on their performance during the construction process.

Overview of Construction Work

The hazardous nature of construction operations, as well as the inadequate working conditions, have posed a substantial challenge (Gunduz and Yahya, 2018; Yap *et al.* 2019). Its site-based work patterns, combined with its bad health and safety records, give an impression of a workplace that is far less desirable than those of sectors that are thought to offer good pay and career opportunities. (Ofori, 2015; Rahim *et al.* 2016). The construction industry's bad image has a significant detrimental influence on its capacity to recruit and keep a gender-balanced working population. (Infante-Perea *et al.* 2018).

Long working hours are also generally perceived as a feature of construction employment (Alvanchi *et al.* 2012; Campbell and van Wanrooy, 2013). Long work hours, combined with the increasing demands of family responsibilities, have been linked to burnout, a state of chronic stress and job dissatisfaction, according to previous research (Alvanchi *et al.* 2012; Campbell and van Wanrooy, 2013; Enshassi, Al Swaiti and Arain, 2016). Furthermore, tight requirements for the project and different changes in weather

climates necessitate level of flexibility on the part of employees' presence for work, culminating in a juggling of work and family responsibilities, as few construction companies provide employee assistance on work-life balance issues. (Enshassi *et al.* 2016; Raiden *et al.* 2016; Gunduz and Yahya, 2018).

Workers' Entry into the Construction Industry

Studies have revealed that jobs in the construction industry often show a dynamic image, with large numbers of skilled and unskilled labourers appearing to fill requirement during peak seasons, and disappearing during times of low need (Ogunlana *et al.* 1996; Soekiman *et al.* 2011; Yap *et al.* 2019). Zannah *et al.* (2017) and Chan *et al.* (2020) identified skilled workers in the construction industry as masons (bricklayers), steel fixers, electricians, carpenters, plumbers, welders, painters, tile fixers, plant operators and mechanics. Studies of Ogunlana *et al.* (1996); and Soekiman *et al.* (2011) also asserted that the movement of these skilled labourers may largely be due to the commonness of skill requirements that construction work shares with other industries, and also that a significant number of men who pick up construction skills over the years, work elsewhere just to earn a livelihood during lean periods. In addition, Zannah *et al.* (2017) and Chan *et al.* (2020) found that most skilled labourers need little education and vocational skills which are mostly gained during apprenticeship with an experienced master whereas for unskilled labour, there is no formal apprenticeship or vocational education for entry into construction.

According to studies by Ofori (2015), Haupt and Harinarain (2016), and Yap *et al.* (2019), there are two more significant avenues of entrance into construction trades: transfer of labour from rural areas with basic skills, and what is known as "direct recruiting." Ofori (2015) and Yap *et al.* (2019), further argues that in many third world countries, both men and women are often allowed to work on a short-term basis to alleviate labour shortages. After starting work in construction, workers can 'transfer' from one job site to the next, sometimes with the same contractor or 'master,' and in certain situations, contractors would even refer 'exceptional' labourers to other contractors for employment.

Ofori (2015), also explained that the site engineer generates a weekly work plan and notifies the 'master,' who then arranges the labour accordingly. In such a case, (Khamis *et al.* 2017) observed that workers who stayed on the working site enjoyed first priority in securing a job.

Other studies have found that job seekers can sometimes be sponsored by an active working member, and that once the applicant decided to pick up the job and accepted the contractor's or 'master's' terms and conditions, the applicant could be confirmed as a 'permanent' worker (Gunduz and Yahya, 2018; Nalitoela *et al.* 2020). As a result, the worker is assured of regular employment prospects, and also the building contractor did not have to look for labour at all times, resulting in the creation of a labour pool for the construction sector.

Categories of Employment in the Construction Industry

Because employment is among the most significant socio - economic issues across every nation, decision - makers are often concerned about metrics of labour use and non-utilization (Raiden *et al.* 2016; Chieng *et al.* 2019). By these authors, employment is an agreement between two, one of whom is the employer and the other of whom is the employee, and that in a business context, the employer devises a productive activity, usually with the goal of making a profit, and the employee contributes labour to the organization, usually in exchange for a wage. However, investigations on the industry's employment practices indicated that there are different types such as casual work, permanent employment, short-term or temporary employment (Bilau *et al.* 2015; Dai *et al.* 2009).

Casual Employment

Casual employees, as defined by Ofori (2015), Haupt and Harinarain (2016) and Akanni (2020), are individuals employed outside of manufacturing or service sectors, such as construction labourers, load carriers, and handcart pullers, who are hired for short periods of time and then have to look for work. Their research discovered that the construction sector relied on the utilization of casual labour (skilled and unskilled labour) in many circumstances, and that these employees were generally daily-paid labourers who were paid at the discretion of the company. Their research also discovered that construction sector casual employees could not be easily tracked down to a specific place, and that their inconsistencies in skills and job quality might be attributed to their unpredictability. The temporary nature of this type of employment in the industry made planning a vague process and contributed to poor time and cost performance (Ofori, 2015; Haupt and Harinarain, 2016).

Permanent Employment

According to Odesola and Idoro (2014) and Bilau *et al.* (2015), permanent employment for skilled workers used to be popular in Nigeria few years after independence and up to the post-civil war construction but declined later. Their research discovered that this type of employment is closely linked to both blue-collar and white-collar jobs where a person is hired on a temporary basis and subsequently promoted to a permanent position after completing a probationary period. This mode of employment is protected by official legislations regarding wages, social security and a contractual agreement may be established between the firm and the workers which may specify welfare, accident compensation and other conditions of service.

Short-Term or Temporary Employment

Short-term or temporary employment is contracted and paid per day, month, or season, or for piece-work, according to Rahim *et al.* (2016) and Raiden *et al.* (2016). However, there is no consistency in getting a job because workers in this category are usually employed for the period of a specific contract or job, and they may be laid-off at any time the firms' desire. The difference between this arrangement and the casual wage workers' group, according to Rahim *et al.* (2016) and Raiden *et al.* (2016), is that 'short-term wage workers' have such a considerable degree of job opportunities. Their research also found that firms hired upwards of two-thirds of its workforce from this category; it also revealed that each construction site had between ten and fifteen permanent skilled workers, with the remainder being short-term or casual staff.

Hiring and Firing Employment

According to Rahim *et al.* (2016) and Raiden *et al.* (2016), the utilization of this method of employment varied greatly amongst organizations and industries. Some construction firms would go to great lengths to avoid reducing their personnel through layoffs while others constantly raised and decreased their workforces in response to changing demand. Raiden *et al.* (2016), asserted that this type of work arrangement does not give job security and that the method has an influence on not only the firm expenses but also labour relations, productivity, and worker morale.

The study also discovered that collective agreements or company policies may limit hiring and firing practices, as hiring costs include the costs of recruiting, screening, and training to bring a new employee up to full productive skill, whereas firing costs include employee benefits, severance pay, and other costs associated with layoff.

Overtime and Undertime

According to Chieng *et al.* (2019), 'undertime' is a planned under-utilization of the work force rather than layoffs or perhaps a shortened work week while overtime is the opposite of undertime, and this may be regarded as an employment inside other form of employment. According to Chieng *et al.* (2019), overtime

is sometimes employed instead of short or medium-term labour adjustments, especially if the change in demand is considered temporary. The study also discovered that managers are quick to utilize undertime because workers are paid less during that time, while managers are sometimes hesitant to use overtime because it costs roughly 150 percent of ordinary time for other types of labour, with double time on weekends and holidays.

Internal Recruitment

Internal recruiting, defined by Raiden *et al.* (2016) as "considering current employees as applicants for open positions," is a type of employment. It refers to the practice of identifying suitable internal candidates and encouraging them to apply for and accept available positions within the organization. The study explained further that internal recruitment can also take the form of promotions to higher-level roles or transfers from one post to another at the same level.

According to the findings, promoting from within provides tremendous motivation for present employees while also assisting the company in retaining competent and skilled workers.

Performance measurement

The properties of outputs that are recognized for evaluation purposes have been described as performance measurement. (Nassar and AbouRizk, 2014; Naoum, 2016; and Demirkesen and Ozorhon, 2017). It is also a critical indicator of the organization's ability to assess how effectively the activities within a procedure or the outputs of a method perform in achieving a set goal. (Durdyev and Ismail, 2016; Raiden *et al.*, 2016). Performance measurement, according to Wibowo and Sholeh (2015), Demirkesen and Ozorhon (2017) and Akanni (2020), might be categorized depending on the method and measuring area, as well as in terms of technical, commercial, and overall performance. In their contributions, Ayegba and Agbo (2015) agreed that the areas of measurement can be at planning, design, and construction levels. Time, workmanship quality, accident involvement, and technical-experience performance are crucial, according to Durdyev and Ismail (2016) and Naoum (2016), particularly in actual construction, and could be used to evaluate the competence of skilled labour to work with.

Buttressing this assertion, Ayegba and Agbo (2015) and Naoum (2016), defined quality as the totality of features required by a product or services to satisfy a given need and that time, accident involvement and technical-experience performance are the extent to which a skilled labour actually deliver this quality products or services that meet their employment requirements. However, Durdyev and Ismail (2016) and Naoum (2016), were of the opinion that the assessment of performance is somewhat subjective and as such variables of the measurement of time, workmanship quality, accident involvement and technical-experience performance of skilled labour during the practical construction could minimise subjectivity

Materials and Methods

Sample size

A total of Seventy-one (71) construction firms who registered with Federation of Construction Industry (FOCI) in Lagos State were considered as the study population. The information obtained from FOCI is as shown in Table 1.

The statistical sample size 'η' of the population was calculated using the formula given by Sprent and Smeeton (2016) as:

$$\eta = n^1 / [1 + (n^1/N)] \quad (1)$$

where:

$$\begin{aligned} \eta &= \text{sample size;} & n^1 &= S^2/v^2; & N &= \text{total population} \\ v &= \text{standard error of the sampling distribution} = 0.05 \end{aligned}$$

S = maximum standard deviation in population at a confidence level of 95%

$$S^2 = (p) * (1-p) = (0.5) * (0.5) = 0.25$$

Therefore, η for 71 construction firms was evaluated as:

$$\eta = 0.25/0.05^2 / [1 + ((0.25/0.05^2)/71)] = 100/[1 + (100/71)] = 42$$

Table 1: Distribution of FOCI Registered Construction Companies in Nigeria

S/№	Location	№ Registered
1	Abuja	21
2	Ibadan	4
3	Kaduna	8
4	Lagos	71
5	Others	11
TOTAL		115

Source: FOCI Lagos (2019)

Pilot Testing

A pilot test was conducted to evaluate craftsman's performance using a questionnaire administered in a random survey method, with the goal of determining the relevancy of the questions and scale items, testing the range adequacy of response options, assessing the questionnaire's internal consistency, and determining the overall effectiveness with which respondents answered the questionnaires. This is in accordance to previous and similar studies such as Prescott and Soeken (1989); Jarkas (2013); and Kisi *et al.* (2017). Pilot testing, according to Kisi *et al.* (2017) and Mohajan (2017), is essential prior to conducting a main survey as it clarifies the questions and scale items, as well as receiving suitable feedback from the participants. Babbie (2013) and Mani *et al.* (2017) also agreed that a pilot study is a preliminary study that should be conducted in order to ascertain the feasibility of the main survey and it entails data collection on a small scale, data processing, and data analysis with the goal of determining how the whole questionnaire to be used in the main survey performed during all stages of the survey process.

In conducting this pilot study, the questionnaire was drawn from Identified areas of performance with subjective variables for the measurement and distributed to forty-two (42) respondents who were experts/judges in five areas - (human resources managers; construction managers; site engineers; supervisors and foremen). The respondents were randomly selected within the population and were those that had over ten (10) years of relevant experience in construction field (Kisi *et al.* 2017; Jarkas 2013; Akanni, 2020).

The experts' assessments were used to calculate the Relative Importance Indices (RII). The relative importance index (RII) measures how influential or weighted each parameter is in the subgroup (Kisi *et al.* 2017 and Jarkas 2013). The RII for each variable was then calculated in each case as:

$$RII = \frac{5(n_5) + 4(n_4) + 3(n_3) + 2(n_2) + n_1}{5(n_1 + n_2 + n_3 + n_4 + n_5)} \quad (2)$$

Data Collection

Amended questionnaire after the pilot survey were administered in forty-two (42) randomly selected construction companies. Seven questionnaires were distributed per company to: (human resources manager; construction manager; site engineer; supervisor; foreman block and concrete work; foreman carpentry and foreman

iron-bending) amounting to a total of two hundred and ninety-four (294). Two hundred and fifty-seven (257) were retrieved making about 87% response rate. This response rate 87% was considered adequate (Nulty, 2008).

Results and Discussion

Table 2 shows the calculated mean interval scores (MIS) of each item used to measure the craftsmen's performance, as well as the ranks based on the weight of each item.

Table 2: Relative Importance Index and Ranking of Craftsmen's Performance from the experts' scores

Area of craftsmen performance	Human Resources Managers		Construction Managers		Site Engineers		Supervisors		Trades Foremen	
	RII	R	RII	R	RII	R	RII	R	RII	R
Technical Experience										
Adherence to construction methods	4.27	1	4.17	4	3.73	2	4.47	2	4.43	1
Understanding working drawings	4.20	2	4.60	1	3.67	4	3.60	6	4.10	3
Ability to interpret technical details	4.10	3	4.33	3	3.77	1	4.63	1	4.20	2
Innovation of new construction ideas	3.50	7	3.53	6	3.30	7	3.53	7	3.97	5
Providing knowledge to unskilled workers	3.80	5	4.47	2	3.70	3	4.30	3	4.03	4
Understands work activities	3.93	4	3.87	5	3.37	6	3.67	5	3.87	6
Rank on the list of the firm skilled workers	3.57	6	3.30	7	3.43	5	4.03	4	3.63	7
Workmanship quality										
Minimal rework	4.27	2	4.43	1	4.37	3	4.13	3	4.43	1
Ability to use quality specified materials	3.97	4	4.27	2	4.47	1	4.00	4	4.40	2
Proper setting-out of work	4.67	1	4.10	3	4.40	2	4.23	2	4.33	3
Sufficient cleaning	3.53	6	3.90	5	3.77	6	3.97	5	3.73	5
Ability to use quantity specified materials	3.60	5	3.63	7	4.17	4	3.80	7	3.50	7
Material handling	3.43	7	3.73	6	3.33	7	3.87	6	3.53	6
Machine handling	4.10	3	4.03	4	3.80	5	4.53	1	4.23	4
Time										
Understanding construction programme	4.40	1	4.23	2	4.13	3	4.07	4	4.13	3
Communicate work-in-progress promptly	3.67	6	3.97	3	4.10	4	4.43	1	4.00	4
Report at work promptly	4.17	2	3.67	4	4.23	2	4.10	3	4.50	1
Takes instructions from foreman	3.90	4	4.60	1	4.33	1	3.80	5	4.40	2
Act promptly on instructions correctly	4.10	3	3.60	5	3.67	6	4.17	2	3.87	5
Always ready to accept extra work	3.57	7	3.53	6	3.40	7	3.63	6	3.53	7
Complete daily assigned work to time	3.73	5	3.40	7	3.70	5	3.43	7	3.77	6
Accident Involvement										
Works to promote safe environment	3.80	3	3.73	3	4.10	1	3.73	2	3.93	3
Adherence to company safety plans	3.87	2	3.63	5	3.53	4	3.03	5	3.73	4
Display of musculoskeletal disorders	3.40	7	3.60	6	3.20	7	2.93	6	4.27	1
Ability to use special power tools	3.73	5	3.87	2	3.87	3	3.13	4	3.67	5
Likes to work without protective gadgets	3.77	4	3.70	4	3.43	5	3.57	3	3.50	7
Careful about construction site conditions	4.10	1	3.90	1	4.00	2	3.83	1	4.13	2
Always in conflicts with co-workers	3.60	6	3.57	7	3.30	6	2.40	7	3.60	6

Key: RII – Relative Importance Index, R- Rank

Agreements among experts and Test of significance

Kendall rank correlation was used to examine agreement among expert responders (Kendall and Smith, 1939). Kendall rank correlation is a non-parametric test that assesses the strength of agreement among numerous (p) judges (experts) who are evaluating a given set of n objects, according to Legendre (2005) and Akanni (2020). When the variables are measured on a scale that is at least ordinal, the test does not require any assumptions about the distribution of the data, and this is an acceptable correlation analysis (Babbie, 2013). Since there are five sets of experts (judges) in this study, the strength of agreement among them was calculated using the Kendall coefficient of concordance **W** (Kendall and Smith 1939) formula as:

$$W = \frac{12S^2 - 3P^2n(n+1)^2}{p^2(n^3 - n) - pT} \quad (3)$$

where: $S = \sum R_i^2$ = sum-of-square statistic over the row sums of ranks R_i

p = number of group of judges; (i.e., that is, the main contractor, consultant, and client) list the five

T = correction factor required for tying ranks

n = number of factors or variables

Friedman's chi-square (χ^2) statistics are generally used to test the Kendall's coefficient of concordance (W) for significance level, according to Legendre (2005) and Pereira *et al.* (2015), because the quantity is asymptotically distributed like chi-square with $(n-1)$ degrees of freedom. Therefore, Friedman's chi-square (χ^2) statistics test was used to examine significance for the strength of the agreement.

When the number or group of judges is small i.e., when $p \leq 7$, the χ^2 probability is not calculated in the conventional way; instead, the χ^2 is computed as: $\chi^2 = p(n-1)W$ and compared with the table of critical values (χ^2 tab) for W , which is derived via the method of complete permutations (Legendre, 2005; Pereira *et al.* 2015; Akanni, 2020). In this scenario, the rule of $p \leq 7$ applies as $p = 5$, the results are shown in Table 3.

Table 3: Agreement in ranking of craftsmen's performance

Craftsmen's Performance	Kendall coefficient [W]	Friedman χ^2 [p(n-1)W]	df (n-1)	p-value	χ^2 tab. @ [p ≤ .05]
Technical Experience	0.694	20.83	6	.002	12.59
Workmanship Quality	0.760	22.31	6	.001	12.59
Time	0.622	18.69	6	.005	12.59
Accident Involvement	0.591	17.74	6	.006	12.59

The results of the significance of the agreements at p-values: $p \leq .05$ in Table 3 shows that the variables used are considered to be appropriate for the measurement of this performance of craftsmen. However, the low value of Kendall coefficient concordance; $W = 0.591$ and significance; $\chi^2(df = 6, N = 7) = 17.74$ recorded in the opinion of the experts on the accident involvement as one of the performance area is an indications of individual subjectivity and this is in line with the studies of Durdjev and Ismail (2016) and Naoum (2016). Also, the agreement among the experts clears the doubt about the feasibility of the main survey since the questions and the scale items has been clarified, as well as appropriate answers from the respondents had been obtained (Mani *et al.* 2017; Kisi *et al.* 2017).

Characteristics of Firms Surveyed

Table 4 shows that 69% of the companies surveyed specialized in building works, about 24% in both building and civil engineering works while 7% specialized only in civil engineering works with about 72% of them having 11 to 20 years of experience in the field of construction operation while about 81% operate both in Lagos and other states of the federation though their headquarters are based in Lagos.

Figure 1 indicate categories of craftsmen's employment where about half of the respondents are permanent employees of their respective establishment. Casual employee constituted about 34% while art time employees constituted the least percentage.

Table 4: Characteristics of Firm Surveyed

Characteristics	Frequency	Percentage
Firm Specialization		
Building Works	29	69
Building and Civil Engineering works	10	24
Civil Engineering Works	3	7
Total	42	100
Year of Operation		
0 – 10 years	6	14
11 – 20 years	30	72
Over 20 years	6	14
Total	42	100
Scope of Operation		
Regional	5	12
National	34	81
Multinational	3	7
Total	42	100

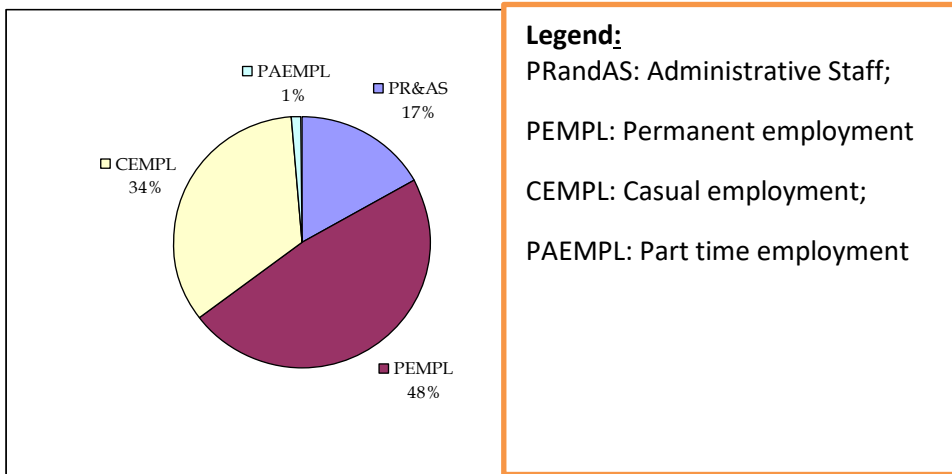


Figure 1: Categories of craftsmen’s employment

Figure 2 on the qualifications of the craftsmen shows that most of them (about 55%) only possess basic primary school certificate or trade test. This is followed closely by employees with Senior Secondary Education with 21% while employees with city and guild are the least represented with 7%.

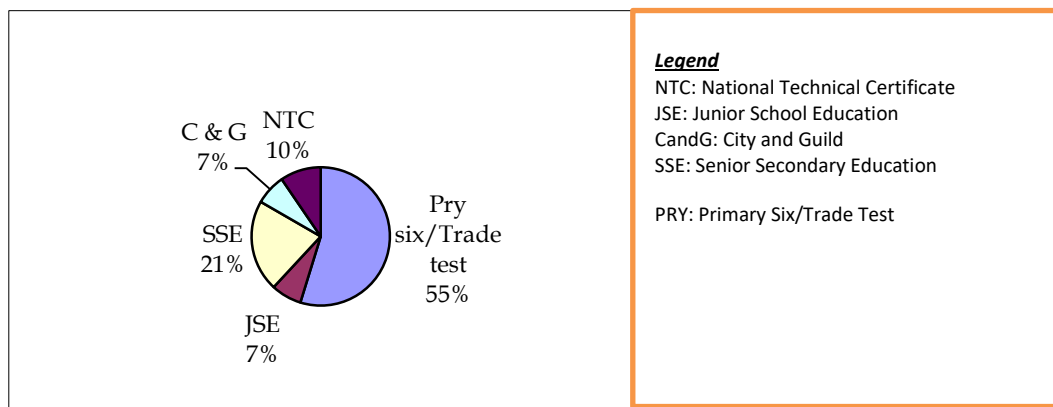


Figure 2: Qualifications of Craftsmen in surveyed companies

Impact of Employment Categories and Performance

This section examines the performance of craftsmen in various employment categories during construction work. The foremen who were directly supervising and monitoring construction activities were those that rated the performance, and the indicators used were time spent on a given quantity of work, frequency of involvement in accident on site, the technicality employed during construction processes and quality of work done while the impact were measured in terms of low, medium and high. In determining the impacts, a crosstabs statistic was applied, and contingency tables were generated from the results. The purpose of the contingency tables was to show the percentages of impacts of craftsmen in various employment on performance indicators. Chi-square (X^2) statistics was used to investigate whether the distributions generated from crosstabs differ from one another in order to establish significant relationships between the two discrete variables (White and Korotayev, 2004).

Table 5 shows the crosstab analysis of employment categories on performance indicators while Table 6 shows the results using chi-square. It could be deduced that craftsmen who were employed on Part Time performed credibly well in technical experience and workmanship quality during construction work on site with 53% and 63% indicating high impacts respectively when compared with other form of employment categories, those who were employed through Hiring and Firing had the lowest performance in time with 53% impact and those on casual category had high impact in accident involvement performance with 63%.

Table 5: Crosstabs of Employment Categories on Performance Indicators

Performance/ Employment Categories	Technical Experience			Workmanship Quality			Time			Accident Involvement		
	IMPACT (%)			IMPACT (%)			IMPACT (%)			IMPACT (%)		
	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High
Permanent	24	35	25	21	20	44	41	15	26	21	15	45
Casual	25	25	38	16	25	47	28	16	44	22	3	63*
Hiring and Firing	27	33	20	20	13	46	53*	20	7	13	13	53
Short term	26	37	29	24	17	52	45	11	37	21	16	53
Part time	21	16	53*	16	11	63*	42	11	37	21	11	58

NOTE: The asterisked represent the highest percentage values among levels of impacts; Med - Medium

Table 6 further showed the results of a chi-square test of independence performed to examine the relationship of categories of employment and the performance indicators. Only the relation between casual category of employment, technical experience and accident involvement variables were significant, $\chi^2 (3, N = 42) = 7.95$ and 17.16 , $p = .047$ and $.001$ respectively.

Table 6: Chi square of Type of Employment and Performance

Performance/ Employment Categories	Technical Experience			Workmanship Quality			Time			Accident Involvement		
	X^2	df	Sigf.	X^2	df	Sigf.	X^2	df	Sigf.	X^2	df	Sigf.
Permanent	4.982 ^a	3	.173	3.374 ^a	3	.338	2.557 ^a	3	.465	4.216 ^a	3	.239
Casual	7.952 ^a	3	.047*	6.779 ^a	3	.079	6.334 ^a	3	.096	17.255 ^a	3	.001*
Hiring and Firing	.836 ^a	3	.953	.415 ^a	3	.937	.655 ^a	3	.884	4.486 ^a	3	.214
Short term	5.831 ^a	3	.120	2.689 ^a	3	.442	2.627 ^a	3	.453	4.882 ^a	3	.181
Part time	1.400 ^a	3	.705	2.173 ^a	3	.537	7.230 ^a	3	.065	1.997 ^a	3	.573

Discussion of Findings

The finding on various percentages of the firm specializations in construction works depicts companies surveyed are in the core of construction business and with 81% of the sample representative on national scope of operation is a pointer to the contributions of the industry to the economy of the nation.

The presence of 48% permanent workers as compared with 34% and 1% casual and part-time workers respectively in the employment of the companies sampled could be an indication that majority of the construction firms participating in Nigerian construction industry preferred permanent employment for the craft workers rather than using casual and part-timers on sites. This finding differs from Haupt and Harinarain, (2016) and Rahimn *et al.* (2016), who argued that large construction companies choose to be flexible rather than retain a massive organization to handle the full construction process as a logical reaction to the construction markets' demand volatility. The general percentage composition of workers in the ratio of 17:48:35 as depicted in Figure 1 shows that only 17% are in the professionals and administrative employments of the companies surveyed. The interpretation of this ratio is that there are just 17% workers who do both the high skilled and administrative job of the industry at high level. This 17% could not be termed to be adequate as one is expecting that the percentage of workers in this category should not have been less than 30% for proper and effective monitoring of construction works. This may had been one of the causes of lengthy time spent on construction works and in many occasions be responsible for extra hours of work as a result of the exigencies of time available for the product delivery thereby leading to constant experiencing of burnouts and stresses among this category of workers.

On the qualifications used for the employment of craftsmen, there appears that most of the companies favoured primary six/trade test and junior school certificate holders (76% all together). This corroborates the findings of Ofori, (2015); Raiden *et al.* (2016) and Yap *et al.* (2019) that construction generally has the ability to absorb the excluded and provide employment for those with little education. However, there is an improvement in this area of craftsmen qualification in Nigeria when compared with the findings of Ofori, (2015) and Zannah *et al.* (2017), that the Brazilian construction industry does not require an average level of education from its labour force and that in China, over 50% of labour force had not received more than primary education.

However, some of the implications of recruiting operatives from such low level of education are that operative may not understand instructions on the use of new materials, instructions, warnings and precautions for safety purpose which are normally written in international language such as English and display on site may have to be interpreted and communicated in the local languages. Again, training of workers with this low level of education in the use of modern equipment could be difficult, it could contribute to the image of the industry being rated low and this might also be one of the reasons why construction job is perceived as being dirty and low skilled job as reported by Ofori, (2015) and the study of Zannah *et al.* (2017).

Conclusions and Recommendations

Delivery of projects to time, cost, quality, satisfaction and other requirements is a major yardstick for measuring performance of projects especially in the construction industry. However, there are various stakeholders and individuals concerned and responsible for the management and overall performance of construction projects. One of such are the craftsmen that are responsible for the direct execution of minor and major aspects of construction projects during the construction phase of projects. This study examined various means of employment of these craftsmen on their performance. It could be deduced that:

1. Craftsmen employed on casual basis are more subjected to accident on construction sites while those employed on “hiring and firing” are more likely to influence timely delivery of construction projects negatively.
2. The craftsmen employed on part-time basis contributed more to workmanship quality and low technical experience.

3. Craftsmen employed on permanent and short-term basis are more reliable and influence performance of construction projects positively.

In a view to ensure optimum performance of construction projects, there is therefore the need to reduce to the barest minimum the number of craftsmen engaged through causal, hiring and firing and part-time basis. Construction firms should consider engagement of craftsmen on permanent basis and alternatively on short-time basis, when necessary, as this will enhance knowledge management of employee and improve overall personnel management by the firms.

References

- Akanni, P. O. (2020). Craftsmen's Performance in selected construction companies in Lagos State, Nigeria - Pilot Study. *Journal of Environmental Technology, Federal University of Technology, Akure*, 2(2), 176-181.
- Akanni, P. O., Oke, A., and Akpomemie, O. (2015). Impact of environmental factors on building project performance in Delta State, Nigeria. *HBRC Journal*, 11(1), 91-97.
- Akanni, P., Oke, A., and Omotilewa, O. (2014). Implications of rising cost of building materials in Lagos State Nigeria. *SAGE Open*, 4(4), 2158244014561213.
- Alvanchi, A., Lee, S., and AbouRizk, S. (2012). Dynamics of working hours in construction. *Journal of Construction Engineering and Management*, 138(1), 66-77.
- Bilau, A. A., Ajagbe, A. M., Kigbu, H., and Sholanke, A. B. (2015). Review of shortage of skilled craftsmen in small and medium construction firms in Nigeria. *Journal of Environment and Earth Science*, 5(15).
- Campbell, I., and van Wanrooy, B. (2013). Long working hours and working-time preferences: Between desirability and feasibility. *Human Relations*, 66(8), 1131-1155.
- Chan, A. P. C., Chiang, Y.-H., Wong, F. K.-W., Liang, S., and Abidoye, F. A. (2020). Work-Life Balance for Construction Manual Workers. *Journal of Construction Engineering and Management*, 146(5), 04020031.
- Chieng, H. P., Arokiasamy, L., and Kassim, K. A. A. (2019). Influence of Human Resource Management Practices on Malaysian Construction Organizational Performance. *Global Business and Management Research*, 11(1), 367-379.
- Dai, J., Goodrum, P. M., and Maloney, W. F. (2009). Construction craft workers' perceptions of the factors affecting their productivity. *Journal of Construction Engineering and Management*, 135(3), 217-226.
- Enshassi, A., Al Swaity, E., and Arain, F. (2016). Investigating common causes of burnout in the construction industry. *International Journal of Construction Project Management*, 8(1), 43.
- Gunduz, M., and Yahya, A. M. A. (2018). Analysis of project success factors in construction industry. *Technological and Economic Development of Economy*, 24(1), 67-80-67-80.
- Haupt, T., and Harinarain, N. (2016). The image of the construction industry and its employment attractiveness. *Acta Structilia*, 23(2), 79-108.
- Infante-Perea, M., Román-Onsaló, M., and Navarro-Astor, E. (2018). Expected career barriers in building engineering: Does gender matter? *Journal of Women and Minorities in Science and Engineering*, 24(1).
- Inuwa, I. I., Joseph, S., and Musa, M. M. (2019). *Effects of craftsmen supervisors project management skills on construction project success in Nigeria*. Paper presented at the IOP Conference Series: Materials Science and Engineering.
- Khamis, N., Suratkon, A., Mohammad, H., and Yaman, S. K. (2017). *A Qualitative Comparison on Guidelines for Construction Workers Accommodation and Facility*. Paper presented at the MATEC Web of Conferences.

- Nalitolela, M. N., Kalugila, S. L., Muganyizi, M. B., and Tesha, D. N. (2020). Motivation and challenges facing employers in recruiting professional women in building construction companies in Dar-Es-Salaam, Tanzania. *International Journal of Engineering and Management Research*, 10(2), 77 - 95.
- NationalBureauofStatistics. (2019). GDP Report Q3 2019. Retrieved from www.nigerianstat.gov.ng website:
- Nulty, D. D. (2008). The adequacy of response rates to online and paper surveys: what can be done? *Assessment and Evaluation in Higher Education*, 33(3), 301-314.
- Odesola, I. A., and Idoro, G. I. (2014). Influence of labour-related factors on construction labour productivity in the south-south geo-political zone of Nigeria. *Journal of Construction in Developing Countries*, 19(1), 93.
- Ofori, G. (2015). Nature of the construction industry, its needs and its development: A review of four decades of research. *Journal of construction in developing countries*, 20(2), 115.
- Ogunlana, S. O., Promkuntong, K., and Jearkijrm, V. (1996). Construction delays in a fast-growing economy: comparing Thailand with other economies. *International Journal of Project Management*, 14(1), 37-45.
- Rahim, F. A. M., Yusoff, N. S. M., Chen, W., Zainon, N., Yusoff, S., amd Deraman, R. (2016). The challenge of labour shortage for sustainable construction. *Planning Malaysia*, 14(5).
- Raiden, A., Neale, R., and Dainty, A. (2016). *Employee Resourcing in the Construction Industry: Strategic Considerations and Operational Practice* (illustrated ed.): Taylor and Francis Group.
- Soekiman, A., Pribadi, K., Soemardi, B., and Wirahadikusumah, R. (2011). Factors relating to labor productivity affecting the project schedule performance in Indonesia. *Procedia engineering*, 14, 865-873.
- White, D., and Korotayev, A. (2004). Statistical analysis of cross-tabs. *Anthrosciences.org*.
- Yap, J. B. H., Chow, I. N., and Shavarebi, K. (2019). Criticality of Construction Industry Problems in Developing Countries: Analyzing Malaysian Projects. *Journal of Management in Engineering*, 35(5), 04019020.
- Zannah, A. A., Latiffi, A. A., Raji, A. U., Waziri, A. A., and Mohammed, U. (2017). Causes of Low-Skilled Workers' Performance in Construction Projects. *Traektoriâ Nauki= Path of Science*, 3(6).