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Construction Tradespeople Perception of the Factors Motivating Labour Productivity on Construction Projects

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Abstract: Construction productivity defines the wealth of a nation as well as the well-being of its citizenry, because it plays a critical role in the overall economic development of a nation. However, there has been a reported decline in labour productivity which has led to poor delivery of construction projects. This issue has been among the leading causes of schedule and cost overruns, quality issues, claims and conflicts, especially in key capital construction projects globally. Poor labour productivity is attributed to the reaction of workers on certain factors. The purpose of this study is to assess construction tradespeople perception of the factors motivating labour productivity on construction projects. To achieve this purpose, semi-structured interview and questionnaire, and a stratified purposeful sampling technique was adopted to gather data from construction tradespeople in Port Harcourt, Nigeria. Data gathered through survey from 106 construction tradespeople, were analysed using frequencies, percentage and factor analysis. The data gathered from 25 interviewees were analysed using thematic analysis. The study concluded that major factors motivating construction tradespeople productivity on construction projects are knowledge and salary-related factors; job security and planning related factors; health, safety and promotion related factor; overtime and work area condition; team building and equipment factors; supervision and recognition factors; management and teamwork factors; and materials and work methods. Furthermore, the implication of the role of financial and non-financial motivators is brought to the fore in ensuring improved and sustainable labour productivity on construction projects. The study recommended that construction organisations should utilise a good mix of financial and non-financial productivity motivators in getting the best out of their employees, especially the site operatives.

Keywords: Motivating factors, productivity, tradespeople, construction industry, construction organisations, Nigeria

1. Introduction

The construction industry influences and propels economic growth and development of nations, directly or indirectly. The activities of the industry catalyse' and stimulate economic sustenance and infrastructural provisions

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(Adegboyega et al. 2019). Productivity determines the wealth of a nation and the well-being of its citizenry (Afuye, 2016). Thus, it is significant to the totality of the economic development of any country (PWC, 2013). Despite the critical role the industry plays in economies globally; it is still inherently characterised by poor workmanship, poor quality of products, low productivity, highly fragmented, conflicting objectives and divided responsibility (Hassan & Salim, 2014). The decline in construction labour productivity is a problem that has impacted on the contribution of the industry to the national economy. This decline has been widely reported in construction management studies (Ameh & Shokunbi, 2013; Fagbenle et al., 2011). The decline in labour productivity is attributed to the fact that the industry is labour-intensive, and according to Attar et al. (2012), the productivity of construction labour is one of the critical issues that confront construction managers daily, as they strive to improve output. Therefore, issues centred on productivity have been identified to be the leading causes of schedule and cost overruns, especially in capital construction projects globally (Jergeas, 2009). Thus, clear comprehensions of the motivating forces that propel and enhance the productivity of construction labour are crucial for improving the overall output of the construction industry.

Effective management of construction labour (professionals and tradespeople) can lead to a reduction of labour cost; as labour cost constitute about 30% to 50% of total construction projects cost (Gopal & Murali, 2015; Shashank et al. 2014). Construction productivity is dependent on labour productivity; even though labour productivity is a sub-domain of overall construction productivity (Rao et al., 2015). This implies that the profit maximisation and losses by construction organisations are determined by construction productivity and labour productivity (Gopal & Murali, 2015). Furthermore, the success or failure of construction projects is also anchored on how well the workforce was managed by those who have been assigned resources. The entire construction supply chain is handled by people who need to be motivated for adequate performance and productivity. For every section or trade or department of the project organisation to function effectively so that quality, cost and time components of the project are met and are within an acceptable level, the manpower must be motivated and properly managed.

There are certain factors that influence construction labour productivity, either directly or indirectly. These factors are regarded as motivators of productivity and need to be identified and assessed at the micro level to improve overall construction output (Gopal & Murali, 2015). Many studies on factors influencing productivity have focused on the perceptions of construction professional (Afolabi et al., 2018; Robles et al., 2014). Only a few productivity studies sampled both construction professionals and tradespeople. For instance, Ugulu et al. (2020) used the semi-structured fact-to-face interview to sample the views of tradespeople and project managers in Abuja and Lagos on project-specific constraints that influencing the productivity of construction tradespeople. Ameh & Shokumbi (2013) adopted questionnaire survey in determining the effectiveness of non-financial motivational scheme on construction workers output in Nigeria. Their study considered skilled and semi-skilled labour and management staff within Lagos state. Fagbenle et al. (2014) carried out a study whose main aim was to determine if a relationship exists between the productivity of craftsmen and semi-financial incentives in the six states of south-western Nigeria. They utilised a questionnaire administered to management and site operatives. In India, Madhan & Gunarani (2018) investigated factors affecting construction labour productivity using Questionnaire among construction experts and site operatives. These studies have not captured the opinions of construction tradespeople in details, as regards factors that motivate their performance and productivity.

Therefore, there is a dearth of studies on the labours' perception of construction productivity (Hamza et al., 2019). The craftsmen working in the construction fields are more informed about the problems of productivity (Thomas & Sudhakumar 2013; Dai & Goodrum 2011; Rivas et al. 2011) since they constitute an excess of 80% of the project team and accounts of about 40% of the total construction project cost (Sherekar & Tatikonda, 2016). There have been calls by researchers for a study that would assess the opinion of craftsmen on the factors influencing productivity (Thomas & Sudhakumar 2013; Dai & Goodrum 2011; Rivas et al. 2011; Chan & Kaka 2007). Hamza et al. (2019) further recommended for a study that will look into construction workers' opinion in the identification of the factor influencing construction labour productivity for residential or industrial construction projects. It is based on this knowledge that this study was set out to assess construction tradespeople perceptions of the factors motivating labour productivity on construction projects, using semi-structured interview and questionnaire. The study aims to assess the perceptions of the various categories of construction tradespeople regarding productivity motivators in the construction industry, to improve the delivery of construction projects.

The outcome of this study will add to the available body of knowledge of productivity in the construction industry. Also, the outcome will be applied during planning and decision making by construction managers regarding what motivates construction labour productivity. Also, how these factors could be directed for optimum usage of workers and to get the best out of them. This is because productivity is a key criterion for the survival and sustenance of construction-based organisations and other organisations in other sectors of the economy. A company that wants to remain above its competitors must be productive and these come only well the workforces are well motivated.

The rest of the paper proceeds as follows. Section 2 reviews the relevant literature, and Section 3 explains the methodology adopted in this study. Section 4 discusses the results and finally, Section 5 provides concluding remarks.

2. Literature Review

2.1 Motivation, Productivity and Labour Productivity

There is a wide report of a decline in productivity in the construction industry (Ameh & Shokunbi, 2013; Fagbenle et al., 2014). This poor productivity record is attributed to workers attitude toward effective management of time allocated to their assigned tasks. Motivation has been established to bring about improved productivity of workers (Albano, 2014). It was argued that both motivation and productivity influences each other. Therefore, construction project managers and other management staff who have decision authorities should be encouraged to put in place those factors that motivate productivity of workers for better organisational performance and survival.

Extant literature shows the abundance of theories and empirical evidence that support the fact that the concept of motivation and productivity has been an area of interest to managers, professionals and researchers (Bawa, 2017). The theories of motivations are, however outside the scope of this study. This study focused on the factors of motivation which are both financial and non-financial that impact on the productivity of construction workers (especially the craftsmen, artisans and operatives). According to Bawa (2017), “motivation is the way and manner in which an individual or group of individuals are inspired to behave in a desired manner to receive some positive rewards or to satisfy certain human needs". Motivation means being inspired to go beyond the normal, going extra mile to achieve the target. Motivation is being driven by a desire to do something and not because one is under duress. Productivity is defined by Bawa (2017) as "the optimal utilisation of resources in the production of goods and rendering of services that meet predetermined objectives". For Eze (1981), productivity is a measure of how well projects or organisational resources are brought together by management and utilised for meeting a set of results. Adnan et al. (2007) defined productivity as the ratio of outputs to inputs, and it is represented below:

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\text{Units}}{\text{Work hours}} = \frac{\text{Total output}}{\text{Total work hours}}$$

Labour refers to all the physical and mental work undertaken for monetary rewards (Jhingan, 1999). Labour productivity is the value of gross output per work referred to as man-hour or work hour (Yates & Guhathakurta, 1993).

2.2 Construction Tradespeople

Construction tradespeople as used here refer to artisans, craftsmen, and other site operatives different from construction professionals and experts. According to Ugulu et al. (2020), tradespeople are workers with trade specialisations where work experience requires training on the job. They include skilled carpenters, masons, plumbers, plasterers, painters, and glaziers. Furthermore, due to modernisation and to avoid gender bias, it is more fashionable to use the term ’tradespeople’ (Ugulu et al., 2020). These set of workers are very critical to the delivery of building construction projects. This is because their inputs in the installations of building materials and components have an impact on the time, cost and quality of the final product (Afolabi et al., 2018). Construction tradespeople are the leading players in the construction industry (Afolabi et al., 2018), as the formed bulk of the employees of construction organisation on construction projects. Ayegba & Agbo (2014) submit that Craftsmen dominate in terms of numerical strength and the roles they play. Thus, they are regarded as the major employees of construction firms, and construction productivity depend largely on the craftsmen. They are an important resource that needs to be properly managed and maximised for optimum productivity. Otherwise, the delivery of construction projects will be hampered. Therefore this set of workers needs to be effectively motivated to ensure the sustenance of their survival for sustainable productivity improvement.

2.3 Construction Site Supervisors

On construction projects, be it building or civil, the role of the supervisor is to ensure that work is done to specification. This is achieved through effective leadership style. Supervisors, as used in this study, are those trade workers that grew through the ranks to a level of authority or responsibilities. They lead or head every trade section (team). For example, the head of a team of masons for carrying out brickwork on the first floor a building construction projects. A supervisor is more than craftsmen and artisans by rank or grade, although not up to full management level (Funso, 2016). Construction workers considered as supervisors are site superintendents, general foremen, foremen, and headmen. The craftsmen and artisans get directives from him/her on what task to do, how to do it and when to do it. The site supervisor is assigned resources and responsibilities which he must execute using the tradespeople and report to management. The quality of work done is dependent on the experiences and skills of the supervisor. The supervisor is held accountable for any failure in terms of time, cost and quality. This is because he/she is knowledgeable about the programme of the works.

2.4 Factors Motivating Labour Productivity on Construction Projects

This study focused on the factors that positively influence construction labour productivity in the construction industry of developing country such as Nigeria, by sorting the opinion of the construction tradespeople who form bulk of the field operatives in every construction project. Construction productivity-related studies abound in extant literature. However, according to Enshassi et al. (2007), it is vital to identify the positive influencing factors and negatively influencing factors. Productivity can be effectively be forecasted at early stages of project development when the significant factors of construction productivity are acknowledged (Lema, 1995).

Low productivity of tradespeople has been linked to inadequate skills which are counterproductive in the quest to deliver projects successfully both in developed and developing countries of the world (Wang et al., 2010). According to Wang et al. (2010), low productivity is experienced in all trades in the construction industry, and this has been blamed on construction tradespeople. Furthermore, in the construction industry of the USA, tradespeople are responsible for discouraging production growth. In an emerging economy like Nigeria, Usman et al. (2012) accentuate that the continue project failure being experienced in the industry are associated with poor contractors performances resulting from poor workmanship, high level of rework, low output, delay completion and cost overruns, high accident records and poor productivity of labour.

Bhatti et al. (2019) carried out study aim at determining the extent to which changes in arid climate environment affect variations in labour productivity. The study concluded that the higher the temperature, the lower the productivity of labour. For successful project delivery, the timing of construction project is necessary, and consideration should be given to variables such as project location, its environment, topography and the capacity of the construction operatives. This implies that favourable working environment; nature of the site location motivates productivity of tradespeople. Hamza et al. (2019) reviewed the factors influencing construction labour productivity and reported that the top five most common factors are; incompetent Supervisor/ poor management and planning, lack of material/tools/equipment, communication/coordination problems and misunderstanding, worker effectiveness/experience and worker efficiency/skills training. This implies that tradespeople productivity is motivated by experienced and competent supervisors, good planning and management, provisions of required materials, tools and equipment, proper communication and coordination, worker knowledge and experience of the job, and worker skill level and training.

In Turkey, Kazaz & Acıkara (2015) found that payment on time, social Insurance, amount to be paid, good health and safety conditions, and provision of good dining hall and residence influences labour productivity. A study in Malaysia Ohueri et al. (2018) revealed that financial incentives, effective management and supervision, training and development, career progression, and Safe and friendly working environment affect labour productivity. Similarly, in Qatar, Momade & Hainin (2019) found that what to achieve in work, interest in the work, involvement in decision making, proper recognition and rewards and opportunity for adequate training and development; are factors that influence construction labour productivity. An effective management program, sound materials management, provision of safety facilities, hoarding of information by the supervisor, sharing of equipment, bonus pays and availability of machinery were reported by (Shan et al., 2016; Dai & Goodrum, 2011) to affect productivity in the USA. Similarly, in an early study carried by Borcherding & Garner (1981) in the United States, the major factors identified to be influencing productivity; availability of materials, availability of tools, rework, Work areas being overcrowded and delay of inspection exercise. In the UK experience, buildability, communication and project planning were reported by Naoum (2016) to be among the factors affecting labour productivity. Work continuity and safety accident are the factors that affect labour productivity in South Korea according to the report of (Jang et al., 2011).

In the United Arab Emirate, Ailabouni et al. (2007) found that proper timing of work, on-time payment of salaries, commensurate paying job, leadership skills of supervisors, and the technical skill of the worker. This ten leading factors affecting construction labour productivity in Trinidad and Tobago as reported by Hickson & Ellis (2014) are; the lack of labour supervision, unrealistic scheduling and expectation of labour performance, shortage of experienced labour, construction manager's lack of leadership, the skill of labour, delay in responding to requests for information, payment delay, communication problems between site management and labour, rain and late arrival, early quit and frequent unscheduled breaks. In the construction industry of Oman, (Jarkas et al., 2015) reported that stakeholders identified overtime working, rework, weather condition, labour fatigue, Design errors and omissions, frequency of changes orders during construction, delay in making requested information available, absence of labour supervision, project specification clarity, level of discipline and coordination among the multiple experts; as the factors affecting productivity. In Saudi Arabia, Mahamid et al. (2013) found that the major factors negatively influencing the productivity of public construction projects are: nonexistence of experienced labour, poor coordination and communication among parties in the construction, bad labour-management team's relations, payments delay issues, abuse of task schedule, the low wage for labour, contractor's financial condition, poor management of construction site, regular variation and change requests. These findings imply that if these conditions or factors are changed, that being on the positive side, construction productivity would improve. A good working relationship between the construction tradespeople and management will improve productivity and the performance of the contractor. Higher labour wages, early honouring of payment agreements, effective site management, and use of experienced labour, reduced rework and change orders, will have a positive impact and motivate productivity of field operatives. Work planning, the nature of the relationship that exists between the workers and management, experience and level of education, technology and

equipment and level of motivation; were identified by (Hiyassat et al., 2016) as the dimensions that are vital for productivity in Jordan.

In another study in Bangladesh based on the relative importance of variables, it was reported that the top factors affecting construction productivity are; supervision of labour, skilled workforce, materials availability, equipment availability and work scheduling (Rakib et al., 2020). In India, Ghate & Minde (2016) reported that the top ranking factors of labour productivity are the availability of skilled labour, materials and tools availability, labour supervision and safety consideration and conditions of the construction site. In another study in Yemen, Alaghbari et al. (2019), Among the factors identified as most significantly impacting construction labour productivity in Yemen according to (Alaghbari et al., 2019) are; skill and experience of labour, materials availability on-site and in the market, efficiency and leadership of site management, political and security situation in the country, the economic condition of the country, equipment available to carry out the work, level of work interruption, level of details provided in the drawings, accuracy and level of specifications provided, building technique and technology. In a study carried out by Ugulu et al. (2020), it was reported that the key areas of project-specific constraints to the productivity of construction tradespeople requiring improvement for better performance of construction projects are: lack of promotions/reward system, unsafe/poor health condition of workers, delay in material availability, inadequate site amenities and an ageing workforce. The provision of basic safety personal protective equipment and clothing, providing and installing safeguard devices; have the most influence on productivity (Setiani & Majid, 2019). According to Dai et al. (2009) and Liberda et al. (2003), safety is one of the key factors influencing labour productivity in the construction industry. Safety is not only important in improving the productivity of tradespeople but can also be applied to the productivity of supervisory and management workforces.

It was submitted by Afolabi et al. (2018) that the most useful control measure for improving construction tradespeople productivity on construction site is on-time payment. The top five critical success factors having the most impact on the productivity of construction artisans are the availability of equipment and material, supervision, payment method, welfare on-site and, weather condition. However, construction professionals and top management were advised to focus on other challenges confronting artisans on construction sites such as; lack of onsite transportation, lack of equipment and materials, inappropriate scheduling of activities, and misunderstanding between artisan and site supervisors (Afolabi et al., 2018). This implies that if these problems are solved, construction artisans would be encouraged to do more, and their productivity will be improved. Ameh & Shokumbi (2013) advocated for less emphasis on financial motivators over non-financial motivators of productivity. They reported that the most effective non-financial motivators of productivity for skilled and semi-skilled workers are the provision of safety equipment, love and belongingness, leadership by example, free transportation and free medical facilities.

Table 1 is a summary of the selected factors from literature and those derived from the semi-structured interview. This table shows a total of 37 factors motivating construction tradespeople productivity on construction projects.

Table 1 - Summary of selected factors from literature review & interview

S/N	Factors motivating construction tradespeople productivity	Sources
1	Level of education	Hamza et al. (2019); Ohueri et al. (2018); Momade & Hainin (2019); Hickson & Ellis (2014); Hiyassat et al. (2016); Ugulu et al. (2020)
2	Level of skill and experience in the trade	Wang et al. (2010); Bhatti et al. (2019); Hamza et al. (2019); Ohueri et al. (2018); Naoum (2016); Ailabouni et al. (2007); Hickson & Ellis (2014); Alaghbari et al. (2019); Ghate & Minde (2016); Mahamid et al. (2013); Hiyassat et al. (2016); Rakib et al. (2020)
3	Good/high salary	Kazaz & Acıkara (2015); Ohueri et al. (2018); Ailabouni et al. (2007); Mahamid et al. (2013)
4	Early payment of salary, wages and other entitlements	Afolabi et al. (2018); Ohueri et al. (2018); Ugulu et al. (2020); Kazaz & Acıkara (2015); Ailabouni et al. (2007); Hickson & Ellis (2014); Mahamid et al. (2013)
5	A good workers compensation package	Ailabouni et al. (2007); Ugulu et al. (2020)
6	Effective communication between workers and management	Hamza et al. (2019); Naoum (2016); Hickson & Ellis (2014); Jarkas et al. (2015); Mahamid et al. (2013)
7	Less repetition of assignments (i.e. reduced rework)	Usman et al. (2012); Borcherding & Garner (1981); Jarkas et al. (2015)
8	Challenging work	Interview
9	Management interested in attending to workers' personal problems	Interview
10	Sense of job security	Ugulu et al. (2020); Jang et al. (2011)

11	Proper planning and scheduling of work	Naoum (2016); Ailabouni et al. (2007); Hiyassat et al. (2016); Rakib et al. (2020)
12	Frequency design changes and interference with work	Hiyassat et al. (2016)
13	Bonus and rewards for extra efforts and commitment	Momade & Hainin (2019); Shan et al. (2016); Dai & Goodrum (2011)
14	Provision of transport facilities to and from site	Ameh & Shokumbi (2013)
15	Good coordination of workers, tasks and other site operations by management	Hamza et al. (2019); Ohueri et al. (2018); Shan et al. (2016); Dai & Goodrum (2011); Jarkas et al. (2015); Mahamid et al. (2013); Mahamid et al. (2013)
16	Good health and safety condition of workers	Jang et al. (2011); Ohueri et al. (2018); Kazaz and Acıkara (2015); Dai et al. (2009); Liberda et al. (2003); Usman et al. (2012); Setiani & Majid (2019); Ugulu et al. (2020); Ameh & Shokumbi (2013); Shan et al. (2016); Dai & Goodrum (2011); Ghate & Minde (2016); Jarkas et al. (2015)
17	Opportunity for promotion and advancement career	Ugulu et al. (2020); Ohueri et al. (2018); Momade & Hainin (2019)
18	Freedom to express oneself	Interview
19	Detailed drawing designs (e.g. self-explanatory drawings)	Alaghbari et al. (2019); Jarkas et al. (2015)
20	Good working relationship with experts and top management	Hiyassat et al. (2016); Mahamid et al. (2013)
21	A good overtime pay	Ailabouni et al. (2007); Ohueri et al. (2018); Shan et al. (2016); Dai & Goodrum (2011); Jarkas et al. (2015)
22	Working in less confined area and well aerated space	Borcherding & Garner (1981); Ugulu et al. (2020)
23	A clear specification of work	Jarkas et al. (2015); Alaghbari et al. (2019)
24	Adequate and functional site amenities (e.g. toilet, canteen, baths, etc.)	Afolabi et al. (2018); Ugulu et al. (2020); Kazaz and Acıkara (2015)
25	Organisation and attendance at social functions for workers	Interview
26	Availability of equipment and tools for carrying out tasks	Afolabi et al. (2018); Hamza et al. (2019); Shan et al. (2016); Dai & Goodrum (2011); Borcherding & Garner (1981); Alaghbari et al. (2019); Hiyassat et al. (2016); Rakib et al. (2020)
27	Provision of accommodation for workers	Interview
28	A good supervision of work	Jarkas et al. (2015); Afolabi et al. (2018); Ohueri et al. (2018); Ailabouni et al. (2007); Hickson & Ellis (2014); Ghate & Minde (2016); Rakib et al. (2020)
29	Performance competition among workers	Interview
30	Ability to take part in decision making	Momade & Hainin (2019)
31	Early quit and frequent unscheduled breaks	Hickson & Ellis (2014)
32	Good site leadership and management	Ameh & Shokumbi (2013); Hamza et al. (2019); Shan et al. (2016); Dai & Goodrum (2011); Ailabouni et al. (2007); Hickson & Ellis (2014); Alaghbari et al. (2019); Mahamid et al. (2013)
33	Cooperation from co-workers	Hiyassat et al. (2016); Mahamid et al. (2013)
34	Passion for the job and satisfaction derived from the job	Momade & Hainin (2019); Hiyassat et al. (2016)
35	Delivery of materials needed for work on time	Afolabi et al. (2018); Ugulu et al. (2020); Hamza et al. (2019); Shan et al. (2016); Dai & Goodrum (2011); Borcherding & Garner (1981); Alaghbari et al. (2019); Ghate & Minde (2016); Rakib et al. (2020)
36	Clear explanation of work method and techniques	Alaghbari et al. (2019)
37	A conducive and friendly working environment	Afolabi et al. (2018); Bhatti et al. (2019); Ghate & Minde (2016)

3. Methodology

This study assessed the perception of construction tradespeople regarding the factors that motivate productivity. The study is Port Harcourt, Rivers State, Nigeria. River state is among the richest states in Nigeria because of the presence of oil and gas. Port Harcourt is the capital and seat of administration of Rivers state. There are many buildings, roads and other infrastructure development projects being undertaken by the government of Rivers state, especially in Port Harcourt, and these attract a lot of building, civil and heavy engineering firms as well as oil drilling and servicing firms (Eze et al., 2020). These firms range from small, medium and large and multi-nationals. Also, according to Obunwo (2016), Port Harcourt houses the head offices of many construction firms. With the volume of ongoing developmental projects which cut across residential, commercial, administrative offices, among others. Port Harcourt has been established as a destination for developers, investors, professionals, construction artisans and craftsmen and the likes. Fagbenle et al. (2012) state that Port Harcourt is among the cities where the volume of construction activities that takes place more than 75%. Due to this reason, Port Harcourt is considered as a suitable one, as there is the possibility of getting a high number of participants for the study.

The sampled population are construction tradespeople such as; Masons (bricklayers & Concreters), painters, Tilers, Carpenters, Steel benders & fixers, and services (mechanical & electrical)). These groups of workers form bulk of the site operatives' and are commonly engaged by all categories of construction organisations. According to Eze et al. (2017), the tradespeople (artisans, craftsmen, or operatives) were considered because they are physically and directly involved in the execution of the works and production of the finished buildings and other construction-related structures. Thus, their productivity can be directly measured against the planned production. Also, sampled were trades site superintendents, foremen, supervisors, and headmen who oversee the tradespeople tasks. These set of workers are the link between the operatives and management. Thus, their participation in this study is justified.

A mixed research design method was used; this involves the use of qualitative and quantitative data sourcing instruments. The essence of the mixed research design is to achieve a better understanding of the depth and breadth of the subject under consideration (Patton, 2002). This study used a structured questionnaire for the quantitative data collection and semi-structured interview for the qualitative data collection. The factors that motivate productivity of construction tradespeople were sources from the literature review, and these formed the basis for developing the interview instrument primarily. The semi-structure interview was used to gather information from the site superintendents, foremen, supervisors and headmen. The outcome of the interview sessions allowed more factors addition and the modification of identified factors list. The design of the interview instrument also allowed for obtaining the background information of the interviewees. In a qualitative research design according to Creswell (2003), knowledge claims are founded principally on constructivist perceptions. Since these individuals understand issues better within the world they live and work, the use of qualitative design becomes suitable. The questionnaire that was used for the quantitative data was made better with the information obtained from the interview sessions.

The quantitative data were obtained using a questionnaire which was self-administered on the tradespeople (Masons, painters, Tilers, Carpenters, Steel benders & fixers, and services operatives), by the researchers and trained research assistants. The questionnaire was designed to obtained details of the respondents' background information, and also on the factors that formed the basis of this study. A stratified purposeful sampling technique (also known as emergent or opportunistic sampling) was adopted during survey exercise. Stratified purposeful sampling is one of the types of purposive sampling designs identified by **(**Palinkas et al., 2015). According to Palinkas et al. (2015), it is suitable for identifying and expanding the range of variation and to narrow the range of variation and focus on similarities. As explained by Patton (2002), a stratified purposeful sample helps to capture key disparities rather than to identify a common core, even though; the similarities might emerge as the analysis progresses. The strata (in this case trade category) helped to organise the participants into a fairly homogeneous sample. The tradespeople and their leaders were divided into their various trades (that is, by stratification), and their opinions on the subject purposively sampled. However, for an economic survey, and to obtained quality data and reduce response bias, some criteria for choosing participants were set. These criteria are that participants;1) must have at least 5years experience in the construction industry, 2) have been involved in the execution of at least 2 building construction projects, and 3) must be currently involved in an active site and willing to participate. These are based on the submissions of Cresswell & Clark (2011), Bernard (2002) and Spradley (1979). It was submitted that purposive sampling allows for the sampling of groups of individuals who are knowledgeable and experienced enough on the subject of interest, that are available and willing to participate, and are capable of communicating and sharing their experiences.

Eighteen construction organisations indicated a willingness to participate in the survey, and these cut across twelve active building construction sites in the study area. These details were gotten during the initial preliminary survey. For convenience, the artisans and tradesmen are regarded herein as '*tradespeople*', while the trades heads/leaders (section heads) of the tradespeople are regarded generally as '*Tradespeople with leadership roles'*. These are construction site workers other than the professionals and experts among them. This set of workers play a supervisory role in ensuring compliance with designs, specification and safety in executing tasks. This study adopted Eze et al. (2017) grouping of construction site workers, and these are; 1) Group 1 - Concreters/Mason/Bricklayers, 2) Group 2 - Steel benders/fixers, 3) Group 3 – Carpenters, 4) Group 4 - Services Operators (Plumbers & Electricians), and 5) Group 5- Finishers (Tillers, Painters). The survey period took about 12 weeks. During the initial survey, 25 *Tradespeople with leadership roles'*

were sampled using the semi-structured interview. 106 artisans and tradesmen (tradespeople) participated in the questionnaire survey.

The response rate could not be ascertained because there was no database of participants with the set criteria; thus, making the sample size calculation difficult. Data analysis were done using frequencies, percentage and factor analysis. The outcome of the analyses were properly organised and presented in the tables for proper description and discussions. Frequencies and percentages were used to analyse data related to the respondents' background information. While Factor analysis (FA) was utilised in analysing the factors motivating construction tradespeople productivity. FA was used primarily to organise the factors into clusters of manageable and significant proportions. This was achieved using principal component analysis (PCA) since FA is the general term for the family of techniques (Eze et al., 2018). PCA is among the techniques of FA used to determine the existence of the relationship amongst variables. According to Pallant (2007), the PCA technique is straightforward, and it is psychometrically sound to adopt.

The research questionnaire is reliable and has a very high internal consistency. This conclusion is premised on the Cronbach's alpha value of 0.942 obtained for the 37 factors assessed (see Table 2). The value obtained is higher than the 0.70 proposed by Palinkas et al. (2003) for higher and better reliability and internal consistency of research instruments. Also, it fell within the range (0.80-0.95) for good reliability level proposed by (Kasim et al., 2019). Avoid hyphenation at the end of a line. Symbols denoting vectors and matrices should be indicated in bold type. Scalar variable names should normally be expressed using italics. Weights and measures should be expressed in SI units. All non-standard abbreviations or symbols must be defined when first mentioned, or a glossary provided.

Table 2 - Reliability test

	Case Processing Summary			Reliability Statistics	
		N	%	Cronbach's Alpha	N of Items
Cases	Valid	106	100.0	0.942	37
	Excluded[a]	0	0.00		
	Total	106	100.0		

a. List wise deletion based on all variables in the procedure.

4. Results and Discussion

4.1 Background Information of Respondents (From Interview)

The background information of the interviewees shown in Table 3 indicates that 25 *Tradespeople with leadership roles'* participated. Based on their position/rank, 13(52.0%) are at the supervisory role, 7(28.0%) are foremen, 3(12.0%) are general foremen, and 2(8.0%) are headmen. These show a reasonable representation of the various tradespeople heads on the construction site sampled. It can be seen that based on the five groupings of the target respondents; Group 1 - Concreters/Mason/Bricklayers are more with 9(36.00), followed by Group 5- Finishers (Tillers, Painters, etc.) with 5(20.00%), then Group 2 - Steel benders/fixers and Group 4 - Services Operators (Plumbers & Electricians) are 4(16.00%) each, and lastly, Group 3 – Carpenters are 3(12.0%). These show a fair representation of the various construction trades operatives on the construction sites visited. Based on their organisational type/size; 13(52.0%) work with small organisations, 8(32.0%) work with medium size organisations and 4(16.0%) are from a large organisation. This shows that SMEs dominate the construction industry of Nigeria. In terms of year of experience, 14(56.0%) of the respondents have spent about 11-15 years in the construction industry, those who have spent 16-20 years and 21-25years each are 5(20.0%), and lastly, only 1(4.00%) of the respondents have about 5-10 years' work experience. This shows that the interviews are experienced enough to give a reasonable insight into the subject of this study. With regards to the number of the project executed, a good number of the 18 (72.0%) said they had taken part in 6-10 projects, this is followed by 5(20.0%) who have executed 2-5 projects, then those who have taken part in just 11-15 projects and above 15 projects are 1(4.0%) each. These further shows that the participants are experienced have the requisite experience on what could motivate production and performance of construction worker. This is evident in the number of projects that have successfully been delivered.

The interviewees were unanimous in their responses on the question regarding the relationship between motivation and productivity. They said that level of productivity is dependent on how well-motivated the workers. Further, they said that about 80% of the field workers are motivated by financial-related factors. Also, construction organisations are trying their best in terms of efforts toward improving workers' productivity and performance. Although, a lot still needs to be done in areas of safety of workers because of the number of accidents being experienced.

4.2 Tradespeople Background Information (From The Questionnaire)

The analysis of the Tradespeople background information based on the retrieved questionnaire revealed that 106 of them participated (see Table 4). Of these numbers, 45.28% work with small organisations, 24.53% work with medium size organisations and 30.19% are from a large organisation. Although SMEs dominate the construction industry, the large-sized organisation employs a larger workforce when compared to small and medium-sized counterparts.

However, the respondents cut across the 3 three major categories of organisations that operate in the construction industry of most countries. Based on the trades group representations, 14.15% of them are Carpenters (group 3), 44.34% are Concreters/Mason/Bricklayers (group 1), 15.09% each is Finishers (painters, tilers, among others) (group 5) and Steel benders/fixers (group 2) and 11.32% belong to Group 4 - Services Operators (Plumbers & Electricians). This means a reasonable representation of the various tradespeople on construction projects. With regards to their years of experience in the construction industry, 29.25% have 5-10years experience, 38.68% have spent about 11-15years, 16.98% have 16-20years of experience, 9.43% have spent between 21-25years, and those who have spent over 25years are 5.66%.

In terms of the number of the project involved, 50.0% of the participants have executed about 2-5projects, followed by 37.74% who have executed about 6-10 projects, 10.38% have been involved in 11-15 projects and 1.89% have been involved in 15 projects and above. These results show that the participants are experienced enough and have spent a good number of years in the industry on giving reliable information that will aid this study. With regards to the current level of motivation for productivity in their organisations, 36.79% indicated that they are moderately motivated, this is closely followed by 24.53% who indicated a high level of motivation, then 16.04% indicated very low motivation, 14.15% indicated low level of motivation and 8.49% indicated that the level of motivation in their company is very high. This implies that the level of motivation that would drive productivity lies between moderate to high. This further means that construction organisations still have more to do regarding motivators targeted towards the workforce welfare that would trigger productivity and performance.

Table 3 - Interviewees background information

S/ No.	Grouping	Trade Category	Position	Organisation Type/size	Years of Experience	No. of Projects executed
1	Group 1	Mason-plastering	Foreman-Mason	Medium organisation	15	4
2	Group 5	Finishers (Tillers &Painters)	Supervisor - painters	Small organisation	15	8
3	Group 3	Carpentering	General Foreman-Carpenters	Large organisation	22	4
4	Group 5	Finishers (Tillers &Painters)	Supervisor - painting	Medium organisation	14	8
5	Group 1	Brick/block layers	Headman - bricklayers	Medium organisation	12	5
6	Group 1	Concreting	General Foreman-Mason	Large organisation	24	9
7	Group 4	Services Operators (Plumbers & Electricians)	Supervisor- plumbers	Small organisation	18	8
8	Group 1	Brick/block layers	Supervisor - brick/block layers	Small organisation	15	6
9	Group 2	Steel benders/fixers	Supervisor -Steel benders/fixers	Small organisation	10	7
10	Group 1	Concreting	Foreman-Mason	Large organisation	14	4
11	Group 5	Finishers (Tillers &Painters)	Supervisor - Tillers	Small organisation	12	8
12	Group 4	Services Operators (Plumbers & Electricians)	Foreman-Plumbers & Electricians	Medium organisation	18	10
13	Group 3	Carpentering	Supervisor-Carpenters	Small organisation	12	7
14	Group 2	Steel benders/fixers	Foreman -Steel benders/fixers	Medium organisation	16	8
15	Group 1	Brick/block layers	Supervisor - bricklayers	Small organisation	23	10
16	Group 1	Plastering work	Supervisor-Mason	Small organisation	15	6
17	Group 2	Steel benders/fixers	Supervisor -Steel benders/fixers	Small organisation	15	9
18	Group 1	Brick/block layers	General Forman -	Medium	25	15

			brick/block layers	organisation		
19	Group 2	Steel benders/fixers	Headman -Steel benders/fixers	Medium organisation	13	6
20	Group 1	Concreting	Supervisor-Masons	Small organisation	12	7
21	Group 5	Finishing (Tillers &Painters)	Supervisor - (Tillers &Painters)	Medium organisation	13	6
22	Group 3	Carpentering	Foreman-Carpenters	Large organisation	19	5
23	Group 4	Services Operators (Plumbers & Electricians)	Foreman-Plumbers	Small organisation	15	10
24	Group 4	Services Operators (Plumbers & Electricians)	Foreman-Electricians	Small organisation	24	16
25	Group 5	Finishing (Tillers &Painters)	Supervisor - painters	Small organisation	19	8

Table 4 - Tradespeople background information (from the questionnaire)

Category	Classification	Freq.	Per cent
Organisational Size	Small organisation	48	45.28%
	Medium organisation	26	24.53%
	Large organisation	32	30.19%
	TOTAL	**106**	**100.00%**
Trades group	Carpenters	15	14.15%
	Masons/concreters/bricklayers	47	44.34%
	Finishers (painters, tilers, among others)	16	15.09%
	Steel Benders/fixers	16	15.09%
	Services (mechanical & Electrical)	12	11.32%
	TOTAL	**106**	**100.00%**
Number years in the construction industry	5-10 years	31	29.25%
	11-15 years	41	38.68%
	16-20 years	18	16.98%
	21-25 years	10	9.43%
	above 25 years	6	5.66%
	TOTAL	**106**	**100.00%**
Number of projects involved in the construction industry	2-5 projects	53	50.00%
	6-10 projects	40	37.74%
	11-15 projects	11	10.38%
	Above 15 projects	2	1.89%
	TOTAL	**106**	**100.00%**
The current level of motivation for productivity in your company	Very high	9	8.49%
	High	26	24.53%
	Moderate	39	36.79%
	Low	15	14.15%
	Very low	17	16.04%
	TOTAL	**106**	**100.00%**

4.3 Factors Motivating Construction Tradespeople Productivity

Prior to carrying out the factor analysis (FA), the gathered data were subjected to some analyses to establish their suitability and adequacy for factor analysis. First of all, the sample size and number of variables were examined. The 106 sample size is adequate based on the submissions of (Hair et al., 2010; Pallant, 2007; Tabachnick & Fidell, 2007). Were the communalities is high, the sample becomes less important (Zhao, 2008). Regarding the number of variables, researchers are yet to agree on the most suitable number of variable for factor analysis. Thus, the 37 variables are adequate for FA. Next is to look at the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, and Bartlett's test of sphericity was checked for adequacy and commonalities. From the results in Table 5, the KMO and Bartlett's test of sphericity requirements for FA were met based on the suggestions of (Hair et al. 2010; Field 2009; Tabachnick & Fidell, 2007; Field 2000). According to Eze et al. (2018), the result of Bartlett's test of sphericity indicates that there is the existence of a patterned relationship among the variables.

Table 5 - KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.771
Bartlett's Test of Sphericity	Approx. Chi-Square	4040.839
	df	666
	Sig.	0.0000

It was submitted by Eze et al. (2018) that variables with communalities ≥ 0.5 fit well in the construct with other variables. Thus, from (column 10 of Table 6) it can be seen that the variable have communalities greater than 0.50. The maximum and minimum communalities values of 0.959 and 0.621 respectively, with an average communalities value of 0.801. Based on the results above, it can be concluded that the gathered data is adequate and suitable for factor analysis.

4.3.1 Factor analysis (using Principal component analysis (PCA) and varimax rotation)

After the data factorability confirmation, factor analysis (FA) was therefore executed. The factor analysis was done using principal component analysis (PCA) with varimax rotation as the extraction method. The result of the PCA and factor extraction shows 8 extracted factors based on eigenvalues ≥1. These factors account for about 77.10% of the total cumulative variance. Pallant (2007) and Stern (2010) proposed that the extracted factors are expected to be accountable for over 50% of the total cumulative variance. Based on this, the final statistics of PCA and varimax rotation is satisfactory. Also, the retained (extracted) factors in the final statistics of PCA and varimax rotation have their factor loading to be greater than 0.50, in with Spector's (1992) submission. See results in (column 1 to 9) of Table 6.

Table 6 - Factors motivating construction tradespeople productivity

	Component								Com.
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Level of education	0.887								0.848
Level of skill and experience in the trade	0.870								0.801
Good/high salary	0.847								0.806
Early payment of salary, wages and other entitlements	0.684								0.761
A good workers compensation package	0.636								0.830
Effective communication between workers and management	0.634								0.834
Less repetition of assignments (i.e. reduced rework)	0.599								0.817
Challenging work	0.569								0.792
Management interested in attending to workers' personal problems	0.527								0.723
Sense of job security		0.698							0.793
Proper planning and scheduling of work		0.683							0.731
Frequency design changes and interference with work		0.650							0.849
Bonus and rewards for extra efforts and commitment		0.646							0.777
Provision of transport facilities to and from site		0.582							0.774
Good coordination of workers, tasks and other site operations by management		0.567							0.770

Good health and safety condition of workers			0.877						0.892
Opportunity for promotion and advancement career			0.863						0.879
Freedom to express oneself			0.753						0.788
Detailed drawing designs (e.g. self-explanatory drawings)			0.610						0.662
Good working relationship with experts and top management			0.558						0.621
A good overtime pay				0.745					0.907
Working in a less confined area and well-aerated space				0.714					0.801
A clear specification of work				0.656					0.720
Adequate and functional site amenities (e.g. toilet, canteen, baths, etc.)				0.645					0.650
Organisation and attendance at social functions for workers					0.874				0.866
Availability of equipment and tools for carrying out tasks					0.819				0.872
Provision of accommodation for workers					0.576				0.777
Good supervision of work						0.785			0.789
Performance competition among workers						0.761			0.919
Ability to take part in decision making						0.743			0.862
Early quit and frequent unscheduled breaks						0.566			0.817
Cooperation from co-workers							0.798		0.781
Good site leadership and management							0.699		0.784
Passion for the job and satisfaction derived from the job							0.628		0.959
Delivery of materials needed for work on time								0.843	0.830
A clear explanation of the work method and techniques								0.688	0.751
A conducive and friendly working environment								0.517	0.802
Eigenvalues	12.66	4.42	3.47	2.07	1.77	1.63	1.35	1.15	
Per cent of Variance	34.21	11.95	9.38	5.60	4.78	4.40	3.66	3.11	
Cumulative per cent of the variance	34.21	46.17	55.55	61.15	65.93	70.33	73.99	77.10	
number of extracted variables	9	6	5	4	3	4	3	3	
Total loading	6.25	3.83	3.66	2.76	2.27	2.86	2.13	2.05	
Rank based on Total loading	1st	2nd	3rd	5th	6th	4th	7th	8th	

Com. = Communalities

4.3.2 Cluster Naming and Discussion

In naming the cluster in FA, the emphasis is given to the factor with highest factor loading, in addition to examination of the latent characteristics of the factors with the cluster. However, the first and second factors within a cluster have the highest influence on the naming of a component. From the results in Table 5, nine items loaded under the first component, and they account for 34.21% of the total variance of the retained variables. These items are; level of education, level of skill and experience in the trade, good/high salary, early payment of salary, wages and other entitlements, a good workers compensation package, effective communication between workers and management, Less repetition of assignments (i.e. reduced rework), challenging work, and management interested in attending to workers' personal problems. After a cursory look at the characteristics of the variable, the component was named '*Knowledge and salary-related factors*'. This component is ranked first because it has the highest total factor loading. Knowledge plays a crucial role in bringing about productivity improvement. Knowledge which could be implicit or explicit is earned through workers' skilled and experiences in the industry or from studying the recorded experiences of others. Hiyassat et al. (2016) reported that experiences and level of education are among the main factors that impact on labour productivity. High salaries and wages, timely payment of salaries, and provision of a good compensation package are among the major factors that motivate productivity in the construction industry and beyond. Ailabouni et al. (2007) submitted that on-time payment of salaries and commensurate pay for jobs are among the critical motivators of labour

productivity. The major factors negatively influencing the productivity of public construction projects are nonexistence of experienced labour, poor coordination and communication among parties in the construction, bad labour-management team's relations, payments delay issues, abuse of task schedule, the low wage for labour, contractor's financial condition, poor management of construction site, regular variation and change requests (Mahamid et al., 2013). Afolabi et al. (2018) further identified payment methods and workers welfare as being part of the factors critical to the success of construction artisans' productivity improvement.

After the examination of the features of the items that loaded under the second component, it was consequently named '*Job Security and planning related factors'*. This factor is ranked second based on the total weighting of factor loading. The items that loaded strongly under this component are 6 items, and they account for 11.95% of the total variance explained. These items are; a sense of job security, proper planning and scheduling of work, frequency design changes and interference with work, bonus and rewards for extra efforts and commitment, provision of transport facilities to and from the site, and good coordination of workers, tasks and other site operations by management. The knowledge that employment is secure and free from untimely termination is a key driving force towards improved productivity and performances of workers. Employments in the construction industry are mostly project-based, except for the administration staffs in the company's head office. Construction workers have no job security under project-based organisations, and this has an impact on their level of commitment and productivity. Proper planning and scheduling of tasks leads to reduced interferences and improve coordination of workers, tasks and other management operations. Also, areas of possible conflicts in designs could be observed, and this will reduce unnecessary changes during the execution of work on site. Thus, proper project planning influences construction labour productivity (Naoum, 2016), by reducing clashes and ensure smooth flow of scheduled activities. An efficient bonus and reward system influence productivity, and this support the finding of (Momade & Hainin, 2019; Shan et al., 2016; Dai & Goodrum, 2011). These authors found that proper recognition, rewards and bonus, influence construction labour productivity. One of the challenges that can hamper productivity and in which construction professionals focus in an attempt to improve is the lack of onsite transportation and inappropriate scheduling of activities (Afolabi et al., 2018). Free transportation of worker was amongst the most effective non-financial motivators of productivity for skilled and semi-skilled workers identified by (Ameh & Shokumbi, 2013).

The third cluster accounts for 9.38% of the total variance explain, and it is made up of 5 items. This cluster is ranked third based on the total factor loading of its items. The items that loaded strongly under this components are; good health and safety condition of workers, an opportunity for promotion and advancement career, freedom to express oneself, detailed drawing designs (e.g. self-explanatory drawings), and good working relationship with experts and top management. This component was named *'health, safety and promotion related factors'.* Safety of construction tradespeople is paramount on construction projects. This is because of the need to stay safe, be alive and return back to meet families after work. Also, the high number of accidents records of the construction industry is scary. The construction industry is hazardous; thus, the provision of health and safety facilities will encourage workers to concentrate and do more in their various tasks and assignments. The provision of safety equipment and free medical facilities are part of the most effective non-financial motivators of productivity for skilled and semi-skilled workers reported by (Ameh & Shokumbi, 2013). According to Dai et al. (2009) and Liberda et al. (2003), safety is one of the key factors influencing labour productivity in the construction industry. Safety consideration and conditions of the construction site were amongst the top-ranked factors of labour productivity reported by (Ghate & Minde, 2016). Regardless of the rank of the worker in the organisations, he/she want to be safe and remain safe. The opportunities for promotion and advancement in one's career and freedom of expression could motivate labour productivity. Two among the project-specific constraint to labour productivity reported by (Ugulu et al., 2020) that require improvement are lack of promotions and reward system and unsafe/poor health condition of workers. Good health and safety conditions, friendly environment and career progression affect labour productivity according to the reports of (Kazaz & Acıkara, 2015; Ohueri et al., 2018).

The fourth cluster is ranked fifth, and it is named *'Overtime and work area condition'. T*his component has 4 items that accounted for about 5.60% of the total variance explained. The 4 items are; a good overtime pay, working in a less confined area and well-aerated space, a clear specification of work, and adequate and functional site amenities (e.g. toilet, canteen, and baths). Overtime pay is one of the financial motivators of productivity in the construction industry. Also, there is a tendency to avoidance of errors – mistake and omission during work execution due to clarity of specifications. Jarkas et al. (2015) reported that stakeholders identified overtime working and project specification clarity to be among the factors affecting productivity in the Oman construction industry. The level of details provided in the drawings and accuracy and level of specifications provided influence productivity of construction labour (Alaghbari et al., 2019). The provision of adequate and functional working site amenities is a solution to one of the project-specific constraints identified by (Ugulu et al., 2020). The productivity of workers executing tasks in tight and confined space will be low, mainly because of the lack of working space, likely less aeration and less lighting. Therefore, there is the need to provide adequate lighting, use of the industrial standing fan where the air is needed.

The fifth component has three factors loaded it that accounted for 4.78% of the total variance explained. The three factors are Organisation and attendance at social functions for workers, availability of equipment and tools for carrying out tasks, and provision of accommodation for workers). Following the examination of these variables, the cluster was

named *'Team building and equipment factors'*, and was ranked sixth based on its total factor loading. Social functions and gathering are among team building and development activities that encourage harmonious working relationships and understanding among workers. Team building activities encourage and bring about understanding which could have a positive impact on productivity and performance of teams. Construction tradespeople operations are planning and schedule in teams to ensure smooth and uninterrupted working. Where there is cooperation among the individuals that make of the team, there will be improvement and sustenance of productivity. Also, the provision of free accommodations, especially where the workers are co-located means timely arrival of workers on site. This could improve productivity. The availability of the required equipment and tools affect the productivity of labour. Afolabi et al. (2018) reported that one of the challenges confronting artisans that need to be solved is the lack of equipment and materials. Equipment availability to carry out the work was also reported by (Rakib et al., 2020; Alaghbari et al., 2019). There is a loss of productive time where there are inadequate equipment and tools. Inadequacy leads to sharing, which also affect productivity as identified by (Shan et al., 2016; Dai & Goodrum, 2011).

Four items loaded under the sixth component, and they are; good supervision of work, performance competition among workers, ability to take part in decision making, and early quit and frequent unscheduled breaks. A careful examination of the characteristics of these items shows they are closely related to supervision and recognition, and based on this, the component was named '*Supervision and recognition factors'*. This cluster accounts for 4.40% of the total variance explained of the extracted factors, and it is ranked fourth based on its total factor loading. The successful delivery of construction projects to time, cost and quality is anchored on sound, efficient and effective supervision. Therefore, the level of education, experiences and skills of the supervisory team is critical to working within specifications and contract. Incompetent supervisor/poor management and planning was identified by (Hamza et al., 2019) as one of the factors influencing construction labour productivity. That leadership skill of supervisors was reported by (Ailabouni et al., 2007) to affect productivity. Similary, Hickson & Ellis (2014) and Jarkas et al. (2015) confirmed that the lack of labour supervision affect productivity. This means that the use of a competent supervisor improves the productivity of construction tradespeople. Opportunity to take part in decision-making affects productivity. Where this opportunity exists, workers can make suggestions on the type of training and skills development programme they need. A sense of recognition of opinion motivates productivity and performance of labour. This is because they are seen as being at the lowest strata in the organisation structure. Furthermore, tradespeople attitudes to work are another factor that affects their productivity. This is supported by Hickson & Ellis (2014), who reported that early quit and frequent unscheduled breaks by workers impact on their output.

The seventh component is ranked seventh based on its total factor weighting, and it accounts for 3.66% of the total variance explained. This cluster contains 3 items, and they are; Good site leadership and management, cooperation from co-workers, and Passion for the job and satisfaction derived from the job. A cursory examination of the characteristics of these items shows they are closely related to management and cooperation of team members and was consequently named 'm*anagement and teamwork factors'*. Teamwork is a key to the successful delivery of construction task and the project at large. The level of this cooperation is linked to the leadership and management style of the project managers. Mahamid et al. (2013) found that one of the major factors negatively influencing the productivity of public construction projects is bad labour-management team's relations and poor management of construction site. This implies that productivity would increase where there is a good relationship between the management and the artisans. It is only good site management that can bring such relationships.

The last component contains 3 items and accounts for 3.11% of the total variance explained, and the 62.44% cumulative variance of the extracted factors. The items are delivery of materials needed for work on time, Clear explanation of work method and techniques, and a conducive and friendly working environment. The factors loaded under this component are closely related to materials and construction techniques, and based on this; the component was named *'Materials and construction methods'*. Construction projects like production or manufacturing require materials for productivity and progress. Materials make up of about more than 70% of construction inputs, the availability and the timely delivery of these materials is key to sustainable productivity. Delay in material availability is one of the constraints to labour productivity identified by Ugulu et al. (2020) that requires improvement for better performance. Materials availability on-site and in the local market (Alaghbari et al., 2019), can affect the progress of work. Therefore, effective materials management is needed to ensure that project is delivered on time, within budget and with the required quality. New construction techniques and technology influence productivity (Alaghbari et al., 2019). The use of new and unfamiliar construction methods would lead to reduced productivity and performance of artisans. The artisan productivity when they get familiar with the construction methods.

Figure 1 shows the major factors motivating construction productivity based on the results of the analysis carried out. These factors motivate construction tradespeople to be focused, committed and do more, and their absence will bring about ad decline in productivity. Therefore, improvement in construction labour productivity will lead to successful project delivery in time of time, cost, and quality.

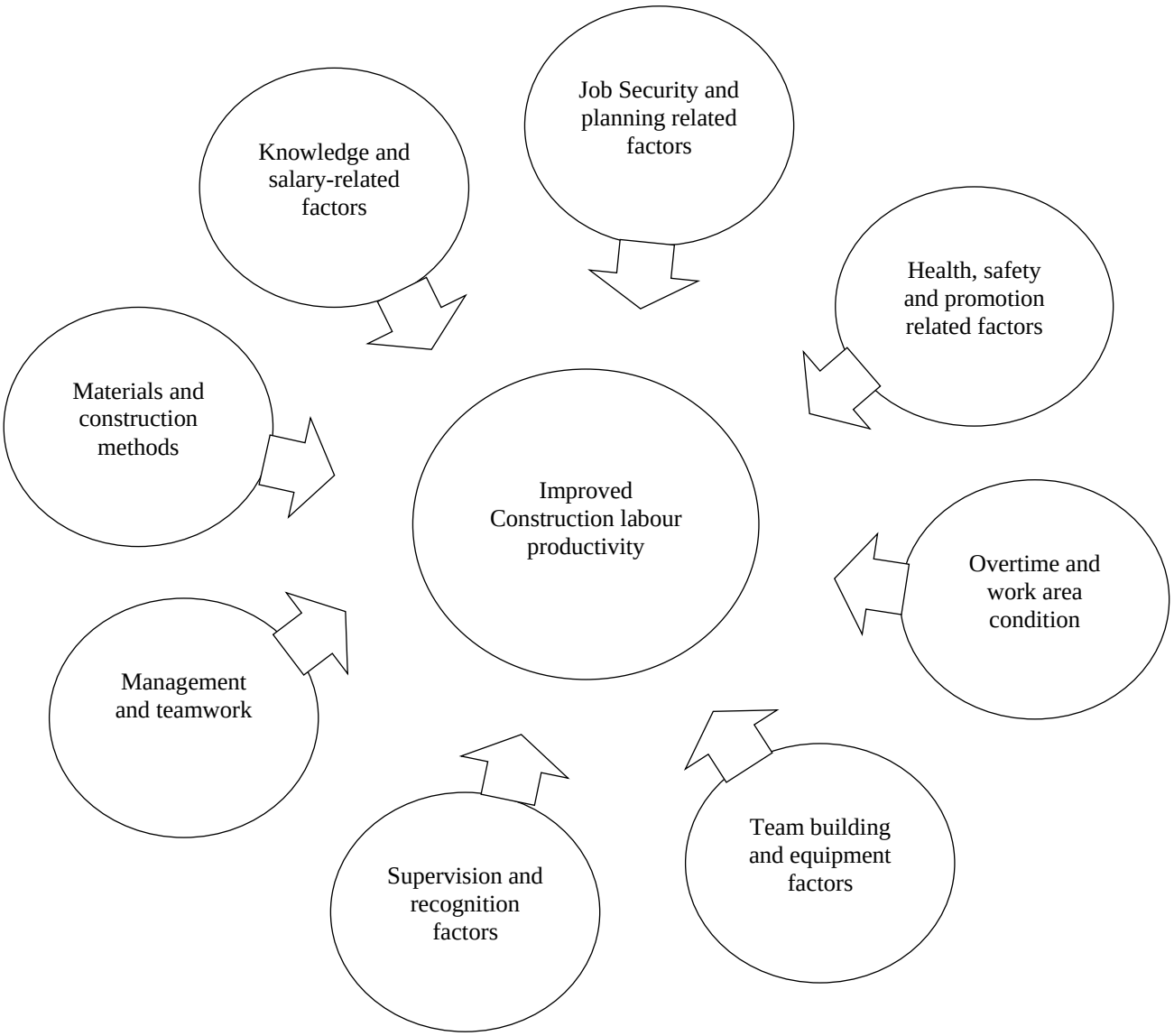

Fig. 1 - Construction labour productivity motivators

5. Conclusion and Recommendations

This study aims to assess construction tradespeople perceptions of the factors motivating labour productivity on construction projects. Using a semi-structured interview and questionnaire, and a stratified purposeful sampling technique in the sampling of the participants in Port Harcourt, Nigeria, the study was able to establish the key factors that motivate construction labour productivity.

The study concludes that knowledge and salary-related factors; job security and planning related factors; health, safety and promotion related factor; overtime and work area condition; team building and equipment factors; supervision and recognition factors; management and teamwork factors; and materials and work methods; are the major factors motivating construction tradespeople productivity on construction projects. Also, construction organisations still need to do more regarding the level of motivation to increase construction labour productivity and project performance. It is to the advantage of the construction organisations and their management to ensure that tradespeople who are the major stakeholders in the field get the necessary things they require to enable them to perform well. The study revealed that the role of financial and non-financial motivators could play in ensuring improved and sustainable labour productivity. From these findings, it is recommended that construction organisations should utilise a good mix of financial and non-financial productivity motivators in getting the best out of their employees, especially the site operatives. The outcome of this is fundamental for the industry players to consider at the early stages of the projects, so that projects will be delivered on time, within budget and with the required quality standard. It also adds to the available body of knowledge on labour productivity in the construction industry. Also, construction firms that want to

remain in business would utilise the outcome of this study for guiding its operations. This is because productivity defines the revenue and successes and prosperity of the organisation regardless of the industry. This study however is limited by locational boundary and response size. Care should be exercised in generalising its findings. Base on this, a similar study is recommended in other region or state of Nigeria or other developing countries; this will provide an avenue for results comparison.

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