

Project Specific Constraints Influencing Productivity of Tradespeople in the Nigeria Construction Industry

Abstract

Purpose- The aim of this research investigated in this paper is to establish the perception of tradespeople viewpoint, of project-specific constraints (PSCs) influencing construction productivity in Nigeria.

Design/methodology/approach- The investigation was carried out using a face-to-face semi-structured interview to collect data based on the research objective. The study employed a purposive sampling of fifteen categories of participants comprising Eight groups of tradespeople and seven supervisors/project managers in some on-going construction projects in Nigeria. The study used a conventional content analysis with the aid of NVivo 12 pro computer software in the research analysis.

Findings- The research evaluated the ~~constraints~~-PSCs and their effect on construction performance of tradespeople. The study findings identified five top ~~limitations~~-PSCs namely: inadequate promotions/reward system, the health condition of workers, delay in material availability, site amenities and an ageing workforce. These constraints seem to be generic across regional context; however, the poor health condition of workers and material unavailability appears to be more common.

Research limitations/implications- The study focused on the Federal Capital Territory Abuja and Lagos State of Nigeria. It provides insight into the PSCs influencing construction productivity of tradespeople in Nigeria. Further research to identify the PSCs in depth, in the Eastern part of Nigeria is necessary. The study focuses on Nigeria. It provides insight into project-specific constraints that influence performance of tradespeople in Nigeria (Abuja and Lagos). Further research to identify the constraints in depth in the Eastern part of Nigeria is necessary.

Practical implication- The PSCs ~~constraints~~ identified in this study can be used by the construction industry as a basis for ~~will~~ providing a methodological instrument for improving ~~addressing key constraints that influence performance~~ construction productivity of tradespeople.

Originality/value- This study is an original ~~investigation-research~~ that has underlined some areas of improvement in construction performance.

Keywords: Construction, Productivity, Project, Specific Constraints, Tradespeople.

Paper type- Research paper.

Introduction

Labour productivity in the construction industry has been a major issue confronting construction project managers as they seek to optimise output (Attar *et al.*, 2012). Understanding the constraints that influence productivity is necessary for the improvement of labour output in the building [construction](#) industry ~~and ultimately project performance~~ (Attar *et al.*, 2012, Enshassi *et al.*, 2007). Jergeas (2009) ~~elaim-opined~~ that productivity in major capital construction projects across the globe leads to delays, and losses causing cost overruns. There have been several contributions made and proposal on constraints that influence construction labour productivity (Jergeas, 2009, Enshassi *et al.*, 2007, Attar *et al.*, 2012). There is little research that assesses project specific constraints (PSCs) and its influence on tradespeople and project managers' productivity.

Globally, tradespeople are the backbone of any construction project; and this category of construction workers' performance is significant regarding improving construction productivity (Wang *et al.*, 2010). Previous research recognises that 97% of the total workforce in the UK construction industry are tradespeople and these categories of workers are the engine room behind project delivery (Office for National Statistics (ONS, 2014). The Bureau of Labour Statistics (2008) observed that practically, 11 million persons, or approximately 8% of the USA total workers, are engaged in the construction industry. ~~Indeed, tradespeople contribution and statistics are not different in the Nigeria construction industry.~~

Wang *et al.*, (2010) stress that deficiencies exist across rank and file of various tradespeople; and these inadequacies are inimical to successful project delivery in both advanced and emerging nations. For instance, tradespeople in the USA [are](#) associated with the likely cause for the discouraging production growth in the USA construction industry. Usman *et al.* (2012) assert that one of the causes of project failures in the Nigeria construction industry is poor performance of the contractors; which are often resultant effects of poor workmanship, rework, low-output, late

accomplishment, cost overruns, high accidental rate and poor labour ~~practice as constraints~~ influencing the success of productivity.

A study on constraints that influences productivity among tradespeople in indigenous construction companies in the Nigeria North-Eastern States observed that inadequate materials, low wages and an unfriendly environmental working condition arising from hot weather ~~had are~~ the most PSCs that influence on labour productivity (Adamu *et al.*, 2011). In a related study, Durdyev and Mbachu (2011) grouped these factors into eight groups of both external and internal factors such as labour-related factors, project finance, workforce, unforeseen statutory events, process/technology, management of project/characteristic of project teams, external factors and compliance.

Justification for the research

Previous studies concerning construction productivity of tradespeople have identified several constraints that affect tradespeople productivity and their impact upon performance. These investigations have utilised perception surveys mainly focusing on the key constraints to enumerate performance of tradespeople. Ordinary, one would expect that PSCs impact productivity. Earlier research has used factor modelling models for investigating construction productivity. While preferably, it should be conceivable to predict productivity onsite if all influencing constraints are known (Jergeas, 2009, Enshassi et al., 2007, Attar et al., 2012), it has been found that the constraints influencing tradespeople construction productivity is a multifaceted variable that is not usually spread and has indeterminate variance and may have chaotic system properties ~~systems~~ (Radosavljevic and Horner, 2002). Perhaps because of this doubt with reverence to the constraints influencing productivity in the construction industry, there is no universal agreement on a general set of PSCs which impact productivity.

The Nigeria construction industry has experience hitches just as in other numerous nations arising from PSCs. There have been variations in literature on the constraints influencing construction productivity and how they are ranked, the relative importance, the uncertainty surrounding the constraints and construction environmental characteristics in Nigeria. An investigation was carried out in Nigeria, focusing on the South-South geographical environment to have a good understanding on influential constraints on construction productivity. Nevertheless, very limited

studies have been carried out on the tradespeople PSCs that influence construction productivity. Identifying and evaluating these PSCs and their influence on tradespeople productivity is crucial for construction managers. Thus, the study aim to investigate the perception of tradespeople viewpoint, of PSCs influencing construction productivity in Nigeria.

Research question:

RQ1. What is the tradespeople perception of the PSCs that influence construction productivity in Nigeria context?

From the response derived from this enquiry, it was anticipated that there would be better insight into the Nigerian construction industry.

Literature Review

Tangen (2005) noted that meanings-definitions of productivity describe what the term means whereas scientific descriptions are express as a basis of measurement, in the prior case, the key objective is not to describe, but rather to enhance productivity. Allmon *et al.* (2000) stated that when a performance ratio (PR) is higher than the unity, it means that the daily based quantities require more work hours than the normal average day baseline; also, it implied that the productivity of that day was not as good as the reference point productivity. The importance of this method is that improvement is built on the constructed work and not the hour work utilised. Productivity measures the type of work done.

Bureau of Labour Statistics (2006) defines labour productivity as production per real operating hours and the term hours refers to the operating hours, and this measure discounts holidays, trip, and sick leave, however, it comprises paid and voluntary overtime. Labour productivity describes the tradespeople hourly output per day, which is often reduced by poor provision of inadequate tools and equipment, delayed, unclear or inadequate instructions, unbalanced work gangs, wrong working method, inadequate incentives, and non-delegation of authority from senior supervisors to lower supervisors (Akindele, 2003).

The term “tradespeople” in this context, refers to workers with trade occupational specialisation which work experience requires training on-the job, it’s a type of recognised vocational education but not bachelor’s degree. e.g., masons, carpenters, painters, plumbers, glaziers and plasterers. Traditionally, the word tradesmen is often used in academic literature (Erik, 1995, Sally, 1996). However, in modern context, it is more fashionable to use tradespeople to avoid gender bias. Project specific constraints (PSCs) is defined as limitations, condition, or power that restricts performance of tradespeople in a building [engineering-construction](#) project environment (Mayer *et al.*, 1995, Whelton *et al.*, 2004). ~~PSCs usually characterise construction project due to nature and work environment (Chua *et al.*, 2003). Moreover,~~ PSC defines the relations between object and the process (Whelton *et al.*, 2004). On the other hand, PSC is anything that can impede improvement toward set project goals (Mcmullen, 1995). It may cause objectionable consequences that may not be helpful to organisational goals. Stein (1997) argued that environmental limitations are usually main constraints in the construction industry.

Factors [Influencing Labour Productivity](#)

Attar *et al.* (2012) investigated the factors and causes which influence construction industry productivity and categorised the factors under 15 groups. The groups are material factors, equipment factors, design factors, execution plan factors, labour factors amongst the ten top factors influencing construction labour productivity of medium-sized and small-size companies, large companies and all general companies. Similarly, a study investigated by Jarkas (2010) observed that operatives are the most productive resource; therefore, construction industry productivity is dependent primarily on human performance and effort.

Motivation may [afford-provide](#) the explanation ~~and reasons~~ why workforce in some construction industry performs better than others and this can describe the believe that success of a business depends on the workers performance since behaviour of workers may be associated to the level of motivation (Cox *et al.*, 2005). In a related study, Barnett (2011) stated that motivation is an acting force within a person that influence the encouragement, path, and determination of goal-directed, volunteer effort. Motivation comprises direction, strength and determination of activities of individuals (Akoi-Gyebi Adjei, 2009). A study conducted by Kazaz *et al.* (2008) clearly stated that motivation is an arrangement of procedures including the mechanisms that support to direct

behaviour of worker in a way, or with a more precise context. It can be defined as all the considerable and inspiring engagements which help workers to accomplish their jobs enthusiastically to meet project objectives (Kazaz *et al.*, 2008).

Enshassi *et al.* (2007) carried out an intensive investigation into the various challenges that influence labour productivity and found that researchers are yet to agree on an acceptable set of constraints with important influence on labour productivity. Previous research studies conducted on the Nigerian construction industry labour productivity shows that the indigenous contractors' productivity is lower than the foreign counterparts (Idoro, 2011, Jimoh, 2012). In a related study carried out by Oluwakiyesi (2011) observed that some minor indigenous construction firms have developed and with others still developing.

In a related study, Ugulu *et al.* (2016) investigated [the](#) motivation influence on labour productivity in South Africa building construction projects and ~~noted~~[opined](#) that the top five factors that influence labour productivity are: provision of transportation, site facilities, break for lunch, days-off, monetary encouragements and skills improvement. However, Jergeas (2009) classified construction labour productivity factors into the following: management of labour, relations and conditions, planning of project, construction management, efficient supervision and support among others. Their investigation recommended management of labour and relations with the various unions as way forward for construction labour productivity improvement.

[Various drivers have been identified by different researchers for declining construction productivity under the categories of: design change, incomplete documentation, supply chain fragmentation, and inefficient project management to be the most significant drivers influencing productivity in the mid-rise residential construction network in Australian](#) (Bohme *et al.*, 2018). [Ugulu and Allen \(2018\) carried out an empirical insight about the significance of on-site craft gangs' learning productivity and observed an average learning rate of 94.21% resulting in 5.79 percent improvement gains. The investigation also found that onsite learning is significant factor influencing construction craft gangs' productivity](#)

Tanko *et al.* (2018) [carried out a study to develop a framework for value management \(VM\) implementation by establishing the influence of critical success factors on current construction](#)

practices that will aid stakeholders to improve productivity of construction practices in the Nigerian construction industry. The study found that environment, people, government and information are critical factors that can be used by decision makers and stakeholders to improve productivity of the current construction practices in the Nigerian construction environment.

In a comparable study, Odesola and Idoro (2014) evaluated the influence of ~~the~~ labour related factors in Nigeria six geographical states (South-South) on the perception of tradespeople, supervisors and engineers. The result of the investigation proposed that improved management of labour practices are important strategy for productivity improvement that will optimise the construction industry productivity. Over the years studies on factors affecting labour productivity have witnessed several classifications with some appearing similar except for the usage of different terminologies. Hence, arising from previous research on constraints influencing tradespeople in the construction industry provides a platform for this study.

Research Methodology

This research adopted a qualitative research approach utilising semi-structured interview with open-ended questions as the research instrument in the collection of the data. The reason is to allow good interaction between the participants and the researcher to have robust access to information as recommended by Creswell (2013). The research used a purposive sampling method for the data collection to recognise the importance of the PSCs influencing tradespeople productivity. The data collection were from Fifteen (15) categories comprising of Eight (8) groups of blockwork tradespeople's made up of average 5 members in each group and also seven (7) project Managers /Engineers that are managing various projects in Abuja and Lagos based on their availability and readiness to partake in the interview as buttressed by Lingayas (2012).

Interview Procedures

The interviews were conducted at the convenience of the interviewee. In all, the researcher took permission to record the interviews and made notes taking as the interview progressed in order to guide the transcriptions. The interview was conducted during break hours from forty-five to one hour in length and done in the respondents site office. The researcher started by describing the interview process and emphasising on confidentiality. The respondents were asked to express their

opinion on issues concerning the research questions. To minimise the risk of bias, the interview questions were written on cards for the respondents to read. English language was used in the interviews and were successful in rich data gathering. The researcher employed the use of mixed open and closed open questions to allow free expression of ideas as supported by previous scholar (Creswell, 2013).

Study Validity

Previous studies have argued about validity, often described as “truth” or “true knowledge in qualitative research inquiry” (Gaskell and Bauer, 2000, KvaleInter, 1996). ~~The-These~~ researchers agreed to the position of Kuzmanic (2009) that there is a “pure form of truth” someplace available, that can be achieved through open external construct and internal validity by employing important valid research method. ~~For honesty, this-~~ This research infers valid qualitative investigation research to credibly represent diverse social worlds (construct) or the diverse explanations to the readers.

To maintain reliability or true knowledge of ~~the-this~~ research, validity was employed throughout the process of the research in three major areas: production (interview questions design, process of interview and the data recording), presentation (data arrangement, replicability and interference validity) and interpretation (discussing meaningful data). The conventional method of content analysis were used to analysed the interview data for easy interpretations to antecedents of debates between the interviewers, in addition to the communication effects that emerged from the subject matter of ~~the-this~~ study.

Data Analysis

The interview transcripts were analysed via content analysis~~The results analysed were in~~ an objective and systematic form as supported by previous study (Creswell, 2013). NVivo 12 pro computer software was employed to aid the ~~content~~ analysis. Content analysis is a systematic data analysis technique that collates valid inferences from texts into fewer content groups based on explicit guidelines of coding and themes (Hasbollah, 2014). Saunders et al. (2012) stated that “qualitative data can be assessed quantitatively using frequency of given events to display a large

amount of themed data.” This method of description and presentations in the qualitative data provided a suitable method for analysing the PSCs in this research question.

The interviewed participants were given a unique set of numbers. The reason ~~is~~ for the coding was to determine the interviewed participants in the analysis stage. The coding begins with the participants coded “P” For example, P01 (P represent the participants while 01 is the number). That way, the participant and its number are automatically determined. From this explanation, if a participant is with the number P15, it can be concluded that this participant interviewed was number 15. Using qualitative analysis techniques, the PSCs were identified and organized into a tabular format. Quantitative statistics were used in the presentation of interviews findings. The qualitative data from the interviews were converted to quantitative data and used in the data analysis. The findings were presented with descriptive analysis and frequency distribution.

The severity of ~~constraints the PSCs~~ which influence productivity of tradespeople was calculated by means of a Likert scale on a 5-point. The values assigned to the importance levels are as follows: extremely severe: 5, very severe: 4, severe: 3, somehow severe: 2, not severe: 1, no comment: 0. The index values obtained from the severity considered were as follows:
Severity index of a measure = $(X_1*5 + X_2*4 + X_3*3 + X_4*2 + X_5*1)/N$.

Table 1. represent each of the research participant profile, while Table 2. describes the demographic information for the various groups of the research participants. The context of this research study participants reveals that the construction firms the participants represent are diverse, representative of various construction companies. The firms were medium and large, ranging from 60 to 750 employees. The interviewees were responsible for their firm's on-site tradespeople and their years of experience, in general, indicated considerable knowledge in their occupation and understanding of the PSCs influencing the productivity of tradespeople in the construction industry.

Discussion of Result

This section comprises of the results from the ratings and a discussion ~~about-on~~ the ~~constraints~~PSCs. These ~~results-analysis were~~ derived from the result presented in table 3 and

~~figure~~figure 1. The discussion made are based on the five-top ranked within the groups of tradespeople and management overall ranking. The top ranked constraint according to the overall Combined Severity Index (CSI) are promotions, the poor health condition of workers, delay in material availability, site amenities and an aging workforce.

Promotion

Table 3 summarises the PSCs that influence construction productivity of tradespeople. The promotion was ranked first among other constraints influencing productivity of tradespeople with a CSI rate of 3.67. The possibility of inadequate promotion can influence the productivity of the tradespeople. Monese and Thwala (2012) noted that in South Africa construction industry, most construction activities are done under difficult conditions like harsh weather and suggested that it is important that employees should be encouraged with promotion to improve their productivity. As a way forward to the problem of workers motivation arising from promotion, a broad research study in Alberta Canada was carried out by Hewage and Ruwanpura (2007), using expectancy model and considering workers effort and performance for improving human motivation issues for contractors and suggested the need for contractors to motivate their workers through promotion as a way forward. This finding agrees with previous research conducted in South Africa and Alberta Canada (Monese and Thwala, 2012, Hewage and Ruwanpura, 2007, Adedokun *et al.*, 2013). One approach to decreasing the challenge of motivation arising from the promotion is to identify non-financial motivation schemes like promotion as an important motivation scheme for improving productivity (Adedokun *et al.*, 2013, Cox *et al.*, 2005).

The health condition of workers

Results in Table 3 demonstrate that the health condition of workers was ranked second with a CSI of 3.53. This constraint was ranked second and can be as a result of inadequate health and safety provision on site by management, for example, insufficient provision of first aid and safety equipment leading to inefficient safety management on site. This result is consistent with some earlier research findings in Ghana (Annan *et al.*, 2015, Puplampu and Quartey, 2012). These Authors observed that the implementation issues of organisational health and safety (OHS) in the construction industry was a key determinant of on-site gangs' productivity and performance. These results findings support Annan *et al.* (2015) study that the increasing rate of urbanisation in Ghana had raised the workforce and had led to the exposure of hazard to the workforce. This result is also consistent with the study in UK survey on safety and health factors influencing construction

productivity in the public building, and civil engineering worked respectively and was ranked 2nd among 37th factors (Wong, 2007). In a similar investigation, Mustapha *et al.* (2015) argued that the construction industry OHS has not been managed effectively due to lack of comprehensive national OHS policy, safety and health standards and government inadequate support for institution regulations.

Many construction tradespeople have died as a result of the poor safety and health condition of workers arising from various degrees of accidents and injuries sustained from construction sites (Agwu and Olele, 2014). Poor health of workers can undoubtedly affect productivity since health is related to the functionality of the individual. To guide against this challenge of the poor health of tradespeople. Mustapha *et al.* (2015) suggested the demand for effective, comprehensive national OHS policy and partnership with organisations. This OHS policy will be accountable for the implementation of the OHS activities and established frameworks responsible for health and safety standards as a way to ratify poor health and safety of workers. This result finding can be generalised as a key constraint that can affect construction productivity of tradespeople since it is consistent with previous research studies in Ghana, UK and Malaysian (Agwu and Olele, 2014, Mustapha *et al.*, 2015, Zakaria *et al.*, 2010).

Delay in material availability

Delay in material availability was ranked third with a CSI of 3.33 in Table 3. The problems associated with adverse material management in the construction industry include supplying and shipping and this influence the productive labour time. This finding is in correlation with previous study which noted that delay in material availability is among the major significant constraint influencing the cost management efforts of building contractors (Chigara and Mangore, 2012, Nyakazeya, 2012). These results support earlier research on constraints influencing productivity in Turkey and Nigeria and found that the material availability in a construction site is running out due to extensive multiple-handling of materials (Kazaz *et al.*, 2008, Ugulu and Allen, 2017). These findings are in agreement with the investigation led by Abdul *et al.* (2005) on significant constraint affecting Malaysian residential projects labour productivity; the researchers noted the following constraints: inadequate materials transportation to site rising from non-payment to suppliers, variation order and delay in issuance of drawings from consultants among other constraints. These research findings can also be generalised with previous studies that supported unavailability of

material as constraints affecting productivity in the construction industry. Also, these findings agree with prior research studies in Harare and Bulawayo, Turkey, Gaza Strip, UK and Malaysian (Abdul *et al.*, 2005, Kazaz *et al.*, 2008, Thomas *et al.*, 2005, Chigara and Mangore, 2012).

Site Amenities

Site amenities had a high impact on productivity of tradespeople with a CSI of 3.13 and was ranked third in Table 3 and Figure 1. This constraint is caused by inadequate site amenities on site, for example, convenience, comfort, services, comfort like eating place. This result is related to the research conducted by Cox *et al.* (2005), these researchers explained the justification why some construction workforce performs better than others noting that the success of business depends on the workforce performance since the labour behaviour may be related to the level of motivation like the amenities on workplace. Also, this finding concurs with the results of previous researchers (Enshassi *et al.*, 2007, Rucklidge and Farrell, 2005, Ouchi, 1981, Ugulu *et al.*, 2016). Therefore, provision of places for eating and convenience for tradespeople could ~~as well~~ be a motivating factor that will improve productivity.

Ageing Workforce

The results in Table 3 and Figure 1 depicts that an ageing workforce also influences the productivity of tradespeople with a CSI of 3.06 and was ranked fifth based on a five-point scale. This result support previous researchers in Europe as constrained that can attribute to the decline in construction productivity (Verhaegen and Salthouse, 1997, Prskawetz and Lindh, 2006). There are large numbers of evidence that supports the opinion that in some stage of adulthood, cognitive abilities decline. From this result evidence, the age of the workers influences productivity of tradespeople (Prskawetz and Lindh, 2006). Significant cognitive abilities, like episodic and speed memory, reasoning, weakening is significant at the age of 50. This constraint is considered potentially important, as mental reasoning ability declines in an ageing workforce and affects productivity. This result is related to findings in Europe (Verhaegen and Salthouse, 1997, Prskawetz and Lindh, 2006).

Conclusion

The construction industry contributes to the GDP in the Nigeria economy and plays a major role in determining economic growth. Understanding the construction productivity would provide more insight into its influence on economic growth. This study, reports on investigation that interviewed experienced groups of tradespeople and construction project managers in Federal Capital Territory Abuja and Lagos State, Nigeria, to rate 20 PSCs that has the potential to influence construction productivity with respect to construction project execution.

These PSCs were ranked based on their Severity Index (SI) as perceived by the groups of tradespeople and project managers who were interviewed for this research. This interview survey shows that there were, in this area, five-top PSCs that the construction project managers need to deal with to optimize their productivity - promotions, the health condition of workers, delay in material availability, site amenities and an ageing workforce – which were rated to have a strong influence on tradespeople construction productivity. In particular, the PSC of promotion was examined in more depth. However, collaboration between the parties to a contract, quality workshops, training of supervisors and enhanced communication between the contract parties have the potential to minimize the influence of these PSCs on tradespeople construction productivity.

~~The construction industry experiences time and cost overrun due to various project-specific constraints that affect construction productivity of tradespeople. The challenges facing tradespeople on-site and its persistent effects show the need for concerted action to improve their technical skills. The study aim is to investigate PSCs that influence productivity of tradespeople within construction production environment.~~

~~This research reports on the investigation that asked knowledgeable tradespeople and project managers in the Nigeria construction industry to evaluate the PSCs with the possibility to impact construction productivity of tradespeople. These constraints were ranked based on their severity, from tradespeople and project managers opinions as illustrated in table 3.0. Quantitative statistics were used in the presentation of interviews findings. The qualitative data from the interviews was converted to quantitative data and used in the data analysis. The findings from the CIS shows the level of constraints with the highest severity and rank as presented in figure 1. The five top PSCs that the construction project managers need to deal with to optimise their productivity are: promotions, the health condition of workers, delay in material availability, site amenities and an ageing workforce.~~

The original contribution of this research was to study the present Nigeria context, the influence of PSCs affecting [tradespeople](#) construction productivity, which was identified as [an](#) important ~~in~~ universal studies, and to reach [a](#) decisions on the significant of these constraints as rated by experienced [groups of](#) tradespeople and project managers in both civil engineering and building ~~aspect of~~ construction in FCT and Lagos State in Nigeria. The paper discovered that while several constraints (supervision, project safety, quality, workforce, motivation, time, leadership, materials, tools and external constraints) have been rated as constraints severely influencing other countries [tradespeople](#) construction productivity. This research has ~~also~~ found that while some ~~constraints~~ [PSCs](#) (transportation, site facilities, break for lunch, days- off, monetary encouragements and skills improvement) have been rated high as ~~constraints~~ [PSCs](#) severely influencing [tradespeople](#) construction productivity in a different geographic location. The main PSC influencing productivity of tradespeople in the construction industry in the research geographical area conducted is promotion of the [tradespeople workforce](#), followed closely by the health condition of workers. However, delay in material availability was highly ranked in this study and other studies. While site amenities and an ageing workforce were also ranked high. This research extends prior research studies that investigated the PSCs influencing tradespeople productivity in the construction industry. The five top PSCs found in this study are in relation with previous research findings in Ghana, South Africa, Malaysia, Turkey, Europe, Canada and UK.

The strength of this study is its comprehensive investigation and ranking of PSCs influencing tradespeople construction productivity in a modern Nigeria context, in which may be different in the area of the demographic, geographic, engineering and economic environment from numerous previous investigations conducted. The study also focused on groups of tradespeople and project managers who are experienced a range of construction activities. In the context of this research, their opinion would be considered credible. The weakness of this study is that the findings need to be validated with an in-depth research. The major PSCs promotions, the health condition of workers, delay in material availability, site amenities and an ageing workforce require further in-depth investigation.

~~The strong point of this study is its broad enquiry and position of the PSCs influencing productivity of tradespeople in a current Nigeria construction context, in which the geographic and~~

demographic location is different from several other studies that have been carried out. This study also focuses on tradespeople, and project managers experienced in the variety of construction projects. Their view would be considered reliable in the context of this research study.

The limitation of this study is that the research focuses on Abuja the Federal Capital of Nigeria and Lagos the commercial city of Nigeria. However, these areas were selected because Abuja is the Federal Capital of Nigeria and the city is undergoing several on-going developmental projects, while Lagos State is the commercial city of Nigeria where numerous construction projects are on-going and, all the major multinational and national construction company's headquarters are in this geographic area which is characterised by a high level of construction activities. However, there is need for further in-depth investigation and validation. In specific, the main PSCs of promotions, the poor health condition of workers, delay in material availability, site amenities and an ageing workforce necessitate further in-depth study.

In order to advance this investigation further, a detailed examination of the major findings of this research with experts from the industry is currently in progress. This research is projected to both authenticate the results of this study and lead to the advancement of potential strategies to minimise the influence of those constraints—PSCs that have the extreme potential consequence on tradespeople construction productivity.

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