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Rex Asibuodu Ugulu, Andrew Arewa and Stephen Allen

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

Andrew Arewa Oyen
Andrew.arewa@coventry.ac.uk
Coventry University UK

Rex Ugulu
Federal University of Technology, Owerri Nigeria
rexugulu@gmail.com

Allen Stephen
Salford University UK
S.Allen8@salford.ac.uk

Abstract

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

Design/methodology/approach- Using a qualitative descriptive survey comprising face-to-face semi-structured interviews and a purposive sampling method, views of eight groups of tradespeople and seven project managers on live construction projects in Nigeria were collected. The study used conventional content analysis with the aid of NVivo 12 pro computer software for the analysis.

Findings- The research evaluated the PSCs and their effect on construction productivity of tradespeople. The findings identified five key PSCs namely: lack of promotions/reward system, unsafe/poor health condition of workers, delay in material availability, inadequate site amenities and an ageing workforce. These results support earlier research on constraints influencing labour productivity, however, the poor health condition of workers and material unavailability appears to be more unique when compared to other previous studies.

Research limitations/implications- The study focused on the Federal Capital Territory Abuja and the Lagos State of Nigeria. It provides insight into the PSCs influencing productivity of tradespeople in the Nigerian construction industry. Further research to identify the PSCs in depth, in the Eastern part of Nigeria is necessary.

Practical implication- The PSCs influencing tradespeople's productivity was identified. The level of relative impact of the PSCs is expected to guide the project team in addressing the PSCs in a method that is cost effective.

Originality/value- This study is original 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 is 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 output in the building construction industry (Attar *et al.*, 2012, Enshassi *et al.*, 2007). Jergeas (2009) 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 proposals on how to improve construction labour productivity due to poor workmanship (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.

Tradespeople are the critical for the delivery of any construction project. This category of construction workers' performance is therefore a significant component in 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 driving force in project delivery (Office for National Statistics, 2014). The Bureau of Labour Statistics (2008) observed that 11 million persons, or approximately 8% of the USA total workers, are engaged in the construction industry. This provides an indication of the importance of the construction industry and the role of tradespeople within it.

Wang *et al.*, (2010) stress that low productivity exists across all tradespeople due to inadequate skill and these inadequacies are inimical to successful project delivery in both advanced and emerging nations. For instance, tradespeople in the USA are identified as the likely cause for the discouraging production growth in the USA construction industry (Wang *et al.*, 2010). Usman *et al.* (2012) assert that one of the causes of project failures in the Nigerian construction industry is poor performance of contractors; arising from poor workmanship, rework, low-output, late completion, cost overruns, high accidental rate and poor labour 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 inhospitable working conditions arising from hot weather are key constraints influencing labour

productivity (Adamu *et al.*, 2011). Durdyev and Mbachu (2011) identified 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 numerous constraints that affect productivity and negatively impact upon performance. These investigations have utilised perception surveys, mainly focusing on the key constraints to enumerate performance of tradespeople. Earlier research has used factor modelling to investigate construction productivity, and considerably it should be possible to predict productivity onsite if all influencing constraints are known (Jergeas, 2009, Enshassi *et al.*, 2007, Attar *et al.*, 2012). Unfortunately the constraints influencing tradespeople's productivity is a multifaceted variable that has indeterminate variance and may have chaotic system properties (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, and hence the need for further research into the complex and variable problem.

The Nigerian construction industry has experienced problems just as other countries arising from PSCs. There have been variations in literature on the constraints influencing construction productivity and how they are ranked, their relative importance, the uncertainty surrounding the constraints and specific construction industry characteristics in Nigeria. According to Usman *et al.* (2012) one of the causes of project failures in the Nigerian construction industry is poor performance of contractors; arising from poor workmanship. In a similar investigation Odesola and Idoro (2014) carried out a survey in Nigeria, focusing on the South-South geographical environment, to understand influential constraints on construction productivity and found that inadequate skills is one of the constraints affecting tradespeople success in Nigerian construction productivity.

Having reviewed previous researches in the field (Attar *et al.*, 2012, Adamu *et al.*, 2011, Odesola and Idoro, 2014, Enshassi *et al.*, 2007, Usman *et al.*, 2012), it can be deduced that limited studies

have been carried out on PSCs that influence tradespeople's productivity and majority of the work was conducted in other countries, mainly focusing on the level of importance attached to constraints and how they negatively impact productivity. No study has been made on the assessment of tradespeople PSCs that influence construction productivity and there is a need to investigate how PSCs impact construction productivity. Based on this, the aim of the study is to explore the views of tradespeople and project manager on the PSCs that influence productivity in the Nigerian construction industry.

Research question:

What are the PSCs that influence tradespeople's productivity in the Nigerian construction industry?

From the response derived from this enquiry, it was anticipated that there would be better understanding of the Nigerian construction industry and how low productivity could be improved.

Literature Review

Tangen (2005) noted that definitions of productivity describe what the term means whereas scientific descriptions focus on measurement, 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 benchmark productivity target level. The importance of this means of evaluation is that improvement is built on the constructed output and not the total hours worked.

The US 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, trips, and sick leave, however, it comprises paid and voluntary overtime. Labour productivity describes the tradespeople's 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 methods, 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 specialisations where 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 a modern context, it is more fashionable to use tradespeople to avoid gender bias. Project specific constraints (PSCs) are defined as limitations, conditions, or power that restricts performance of tradespeople in a building construction project environment (Mayer *et al.*, 1995, Whelton *et al.*, 2004). PSC defines the relations between object and the process (Whelton *et al.*, 2004). Also, PSC is anything that can impede progress towards set project goals (Mcmullen, 1995). It may cause objectionable consequences that may not be helpful to organisational goals. Stein (1997) argued that unfavourable weather conditions is usually the main constraint and limit productivity in the construction industry.

Factors Influencing Labour Productivity

Attar et al. (2012) investigated the factors and causes which influence construction industry productivity and categorised these into 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 provide the explanation why the construction workforce in some countries performs better than others and this can describe the belief that success of a business depends on the workers performance since behaviour of workers can be linked 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 influences the encouragement, path, and determination of goal-directed, volunteer effort. Motivation comprises direction, strength and determination of activities of individuals (Akoi-Gyebi Adjei, 2009). Kazaz *et al.* (2008) clearly stated that motivation is an arrangement of

procedures including the support mechanisms to direct behaviour of workers in a particular manner, or with a more precise focus. It can be defined as all the considerable and inspiring thoughts or actions engagements which help workers to accomplish their jobs enthusiastically to meet project objectives.

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 that critically influence labour productivity. Previous research studies conducted on the Nigerian construction industry labour productivity rate shows that the indigenous contractors' productivity is lower than international contractors working in the country (Idoro, 2011, Jimoh, 2012). In a related study carried out by Oluwakiyesi (2011) observed that some small indigenous construction firms have been established and others are still developing.

In another study, Ugulu *et al.* (2016) investigated the motivational influence on labour productivity on South Africa construction projects and opined that the top five factors that influence labour productivity are: provision of transportation, site facilities, breaks for lunch, days- off, monetary encouragements and skills improvement. 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 a way towards construction labour productivity improvement.

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

investigation on systemic exploration of drivers for enhancing construction productivity utilising a mixed-methods design, the study found and supported the use of systems thinking by industry stakeholders in the formulation of holistic strategies for long-term productivity enhancement in the industry.

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 in improving productivity 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 labour related factors in six geographical states in Nigeria (South-South) on the perception of tradespeople, supervisors and engineers. Findings from the investigation proposed that improved management of labour practices is an important strategy for productivity improvement that will lead to increases in output of the construction industry. Over the years studies on factors affecting labour productivity have seen several classifications developed with some appearing similar except for the use of different terminologies. This previous research on constraints influencing tradespeople in the construction industry provides a platform for this study.

From this preceding research 20 factors were identified that form the basis of the semi-structured interview question.

Table 1.0 summarised the discussions on the constraints influencing productivity in the construction industry. The constraints presented in Table 1.0 are by no means exhaustive, but have been compiled from the literature review of articles on constraints influencing construction productivity discussed above.

Research Methodology

This research adopted a qualitative approach utilising semi-structured interviews as the research instrument in the collection of the data. Using semi-structured interviews as an instrument is one of the most preferred means for qualitative research data collection offering the opportunity to explore issues identified. The aim 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. Table 2.0 and 3.0 represent the participant profile and demographic position. Data collection was undertaken with fifteen (15) groups comprising of eight (8) groups of blockworks tradespeople 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 participate in the interview.

Interview Procedure

The interviews were conducted at the convenience of the interviewee. The researcher asked permission to record the interviews and made notes as the interview progressed in order to help with later transcription. A face-to-face interview was conducted with the respondents who participated. The interviews included structured and open-ended questions. An open channel of communication with the participants was maintained to build a positive relationship and to encourage the participant to answer the interview questions. The interview was conducted during break hours and were forty-five minutes to one hour in length and done in the respondents site office. The researcher started by describing the interview process and emphasising confidentiality. The respondents were asked to express their opinions relating to the research question the research questions. To minimise the risk of bias, the interview questions were written on cards for the respondents to read. English was spoken in the interviews. The researchers employed the use of interview method to allow free expression of ideas as supported by Creswell (2013).

Interview Question

What are your greatest challenges in keeping your tradespeople productive, and what other information, which you consider relevant to this research would you like to share with me?

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). These researchers agreed with 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 methods. This research infers valid qualitative research to credibly represent diverse social worlds (constructs) or the diverse understandings to the readers.

To maintain reliability or true knowledge in 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 was used to analyse the interview data to help interpret antecedents of meaning from the interviews, in addition to the communication effects that emerged from the subject matter of this study.

Data Analysis

The interview transcripts were analysed using content analysis, an objective and systematic approach as supported by previous study (Creswell, 2013). NVivo 12 pro computer software was employed to aid the 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). According to Saunders et al. (2012) “qualitative data can be assessed quantitatively using frequency of given events to display a large amount of themed data.” This method of description and presentation of the qualitative data provided a suitable method for analysing the PSCs in this research question.

The interviewees were given a unique set of numbers. The reason 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). This way, the participant and their number are automatically determined. Using qualitative analysis techniques,

the PSCs were identified and organized into classification in a tabular format. Quantitative statistics were used in the presentation of interviews findings. The findings were presented with descriptive analysis and frequency distribution.

Relative Important Index (RII) was used to calculate the PSCs which influence productivity of tradespeople using 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:

$$\text{Index of a measure} = (X_1 * 5 + X_2 * 4 + X_3 * 3 + X_4 * 2 + X_5 * 1) / N.$$

Table 1. present the 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, representing a variety of 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 Results

This section comprises the results from the ranking and a discussion on the PSCs. These analyses were derived from the results presented in Table 4.0. The discussion is based on the combined ranking of the trade and management viewpoints. The top ranked constraint according to the overall Combined Relative Important Index (CRII) are lack of promotion, unsafe/poor health condition of workers, delay in material availability, inadequate site amenities and an aging workforce.

Lack of promotion

Result from Table 4 shows that lack of promotion has the highest influence on tradespeople's productivity with a CRII rate of 3.67. Adedokun et al. (2013) observed that one approach to decrease the challenge arising from lack of promotion is to identify non-financial motivation schemes as a mechanism for improving construction labour productivity. Like previous research

from the body of literature, respondents raised and discussed various PSCs that affect tradespeople productivity in the Nigerian construction industry. For example, in response to the question “what are the major PSCs that influence tradespeople productivity?”.

A range of views were expressed by the tradespeople. According to P04:

"There are many issues affecting the tradespeople in this project, but the major issue is lack of promotion".

Respondents P06, P07 and P08, agreed that lack of promotion has a severe effect on tradespeople construction productivity. The response provided by respondent P09 and P13 strongly indicated that lack of promotion has become a great concern to the tradespeople unions in Nigerian construction industry.

Similarly, the Managers/Engineers viewpoint and the Tradespeople agree, for example: Respondent P02 strongly believed that there are various ways to motivate the tradespeople productivity, for example, giving work bonus. which will ultimately benefit the construction project managers. Correspondingly, respondent P05 explained that lack of promotion exists for many reasons.

Respondent P01 stated that: *“Lack of promotion of workforce is affected by the prevailing conditions in the country, the management, the specific project and their welfare. Promotion will be given if leaders explain their objectives properly and performance is fairly evaluated to support their teams to achieve various targets”.*

Monese and Thwala (2012) observed that in the 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 the 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 Canada (Monese and Thwala, 2012, Hewage and Ruwanpura, 2007, Adedokun *et al.*, 2013).

Unsafe/Poor health condition of workers

Results presented in Table 4 identify that the poor health condition of workers was ranked second with CRII of 3.53. This constraint 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. Most of the respondent from the tradespeople and Managers/Engineers shared similar views that unsafe/poor health condition of workers are key constraints that have a tremendous direct effect on the health of tradespeople and affect the productivity in the Nigerian construction industry.

For example, respondent P04 stated that “*inadequate provision of safety equipment’s like helmets, safety boots, hand gloves and site clinic on site have great effect on the safety of tradespeople*”.

However, from the managers viewpoint, participant P01 explained the following: “*In Nigeria, construction companies provide safety equipment, but the problem is for these tradespeople to wear the safety equipment and this is one of the issues that affect the health of tradespeople and the productivity*”.

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. These results findings support Annan *et al.* (2015) study that the increasing rate of urbanisation in Ghana had increased the workforce and had exposed an inexperienced workforce force to hazards. This result is also consistent with a study in the UK on safety and health factors influencing construction productivity in public works projects and civil engineering 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 conditions 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 guard against this challenge of 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 finding can be generalised as a key constraint that can affect construction productivity of tradespeople as 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 CRII of 3.33 in Table 4. The problems associated with adverse material management in the construction industry include delay in supplying and shipping and this influences productive labour time. For example, respondent P09 stated the following: “*Delay in availability of materials have a tremendous direct effect on tradespeople productivity, the delay in supplying of materials influence the tradespeople productive time and this affect the productivity*”. Similarly, the tradespeople productivity response provided by responded P13 and P14 supported that material delay in Nigerian construction industry affect the productivity of tradespeople. Furthermore, P04 confirmed that overall tradespeople productivity has been less from when materials were delayed. The issue of delay in materials availability is supported by the tradespeople and Managers/Engineers and this is also supported by body of literature 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 constraints 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 from 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).

Inadequate Site Amenities

Inadequate site amenities had a high impact on productivity of tradespeople with CRII of 3.13 and was ranked third in Table 4. This constraint is caused by inadequate site amenities on site, for example, convenience, comfort, services, comfort like eating place. Inadequate site amenities are the other key issues that all the participant raised and discussed during the interview session. For example, one of the tradespeople respondents, P08 noted the following:

“Inadequate convenience has a serious effect on the productivity of tradespeople, most of the tradespeople have to go the bush for toilet and this affect the productivity”. Also, the issue of inadequate convenience was supported by both the tradespeople and the managers/Engineers.

Cox *et al.* (2005), 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. Similarly, 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 be a motivating factor that will improve productivity. On-site facilities reduce the need for tradespeople to leave site to access required facilities such as canteen and toilet facilities.

Ageing Workforce

The results in Table 4, depicts that an ageing workforce also influences the productivity of tradespeople with CRII of 3.06 and was ranked fifth based on a five-point scale. The response

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provided by most of the respondents (Tradespeople and Managers/Engineers) indicated that ageing workforce has become a great concern to the construction leaders in Nigeria: For example, Respondent P01 explained the following:

“Mental reasoning declines in an ageing workforce and these affect the productivity of the tradespeople”.

This issue of ageing workforce is supported by 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

This study, reports on investigation that interviewed experienced groups of tradespeople’s and construction project managers in the Nigeria construction industry, to rate 20 PSCs that has the potential to influence construction productivity with respect to construction project execution. The study has identified the key PSCs that affect tradespeople’s productivity.

These PSCs were ranked based on their RII as perceived by the groups of tradespeople’s and project managers who were interviewed for this research. The findings shows that the key five-top PSCs that the construction project managers need to deal with in order to optimize their productivity are: lack of promotions, poor health condition of workers, delay in material availability, inadequate site amenities and an ageing workforce – which were rated to have a strong influence on tradespeople productivity. In particular, the PSC of lack of promotion was examined in more depth. However, collaboration between the parties to a contract, provision of career opportunities, safety inductions/training of tradespeople, provision of adequate site amenities, supervisors and enhanced communication between the contract parties have the potential to minimize the influence of these PSCs.

The original contribution of this research was to study the present Nigerian construction industry PSCs affecting tradespeople productivity, which was identified as an important universal study, and to reach a decision on the significance of these constraints as rated by experienced groups of tradespeople and project managers in both civil engineering and building 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 found that while some PSCs (transportation, site facilities, break for lunch, days- off, monetary encouragements and skills improvement) have been rated high as PSCs severely influencing tradespeople construction productivity in a different geographic location. The main PSCs influencing productivity of tradespeople in the Nigerian construction industry in the research geographical area conducted is lack of promotion of the tradespeople, followed closely by the poor 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 the Nigeria construction industry, 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's and project managers who are experienced in a range of construction activities. The weakness of this study is that the findings need to be validated with an in-depth research. The study did not include views from clients and consultants. Also, there was absence of feedback from clients and consultants. It may be important to aim for feedback from clients and consultants. Further investigation should also seek to captures views from these stakeholders.

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 PSCs that have the extreme potential consequence on tradespeople's productivity.

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