Influence of Supervision on Labour Productivity of Finishing Works in Ibadan, Oyo State

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Abstract:

There is the need for continued investigation into construction labour productivity because of its importance in the national economy of a nation. Insufficient training and oversight of construction skilled workers can be directly linked to low productivity. This study assessed the influence of supervision on labour productivity of finishing works in Ibadan, Oyo State. The objectives of the study were to: examine factors affecting effective supervision on construction site, compare the labour productivity of finishing works with supervision and those without supervision and determine the measures put in place by supervisors in ensuring effective labour productivity. The research employed a quantitative approach with the use of personal observation and survey questionnaire. Personal observation was made on 10 construction sites with professional supervision and another 10 site without professional supervision. The research data were collected with the aid of well-structured questionnaires. Also 50 questionnaires were administered to construction project contractors, project managers, supervisors and foremen of small and medium construction firms. The response rate of the questionnaires was 94%. Mean item score (MIS) and T-Test was used to rank the influence of supervision on labour productivity practice in construction workers on a 5-point Likert scale. It was found that the common factor affecting effective supervision on construction site is lack of adequate equipment (MIS = 3.98). It was also found that the key measure for ensuring effective labour productivity is commitment to work (MIS = 3.77) and that there was statistically significant difference between labour productivity of the site with supervision and those without supervision. This findings has led to the conclusion that those site with supervision generate more output than those without supervision with 8% differences. It is recommended that professionals should provide adequate equipment that suit in the work at hand, in order to achieved the organization goal and also improve construction site.

Keywords: supervision, labour, productivity, finishes work.

INTRODUCTION

A nation's construction industry plays a major role in any part of the world through the provision of infrastructures and buildings that support various social, economic and industrial functions (Isa *et al*., 2014). Over the years, the contribution of the industry makes it a major factor in the drive for economic progress and development through the provision of infrastructures (Saurav *et al.,* 2018). In Nigeria, the industry when viewed from the perspective of its dynamism has the capacity to generate employment and absorb both skilled and unskilled operatives for the various trades in the sector (Peter *et al.,* 2014).

Construction is the world's largest industry. Nevertheless, the industry is faced with a numerous of problematical problems regarding poor productivity such as lack communication, inadequate participation, inadequate site visitation, and lack of commitment, inconsistent shared vision, misunderstandings, inadequate safety and insufficient quality of work (Jimoh *et al.,* 2017). Further lamented labour output signifies the quantity at what degree a single unit uses uncommitted resources to develop end product from stimulation. Thus, construction outputs fully rely on achievement of building artisan and as such decreased in labour output will really affect design value, duration and caliber.

In addition, many authors have studied the causes of failure in supervision on labour productivity. Construction projects executed all over the country are faced with numerous challenges such as low wages, lack of substantial and ungrateful working situation which have significant outcome on labour productivity (Ameh and Osegbo, 2011). Odusami *et al.* (2011) affirm that insufficient training and oversight of construction skilled workers can be directly linked to low productivity.

Jimoh *et al.* (2017) worked basically on foundation, block, wall, concrete, work, painting, plastering, but he didn't give a clear indication about finishing is just a mixed up, that leaves a knowledge gap that the study will fill by assessing the influence of supervision on labour productivity of finishing works with emphasis on site with adequate supervision practices and those without supervision. The research will assist the project managers, site engineers and construction team leaders in understanding the factors that enhance effective supervision on construction site.

LITERATURE REVIEW

Over the last few decades, the construction industry has made noticeable progress through advances in heavy equipment, tools, and materials (Goodrum *et al.,* 2009). The industry is one of the most important and significant sectors and supports the economic development of a country (Saurav *et al.,* 2018). As reported by Ade *et al.* (2013), the construction industry contributes to the economy, promotes growth, provides employment to the masses, and established a linkage between the economy and other industries.

Concept of Productivity in the Construction Industry

Productivity can be defined as the use of effective resources (inputs) in producing goods and or services (output) by Anu *et al.* (2014). Two measures of productivity are commonly used in the construction industry (Jarkas and Bitar, 2012). The first measure of productivity is the total factor productivity (TFP), which is defined as the ratio of total input to total output, with the latter usually including labour, materials, equipment, energy and capital. TFP is expressed as shown in Equation 1:

$$\text{TFP} = \frac{\text{Total Output}}{\sum(\text{Labour}+\text{Materail}+\text{Equipment}+\text{Energy}+\text{Capital})} \quad (1)$$

Barriers to improving labour productivity of Finishing Works

The country's economy has become increasingly more dynamic and complex (Peter *et al.,* 2014). As a result, economic measurement and analysis, particularly relating to productivity, have become more cumbersome and complicated (Adnan *et al.,* 2010). The main problem involves properly defining units of measurement, evaluating qualitative changes and obtaining reliable data for both inputs and outputs (Attar *et al.,* 2013). This process is further complicated by the need to price - deflate this data in order to evaluate changes in productivity in real terms. Measurement of inputs is problematic. Variations in the rate of input utilization are at best partially picked up in data series. In particular, the rate of capital equipment utilization, i.e. the measurement of machine hours, is rarely accomplished (Khaled *et al.,* 2011). Labour input, if measured by hours actually worked, is better suited to reflect the changing rate of manpower utilization, but remains an imperfect measure (Soham and Rajiv 2013).

Guidelines for improving the labour productivity of Finishing Works

The study of Attar *et al*. (2012) identified 14ways to improved labour productivity, namely: Proper training of the labourers, Motivation of workers towards project completion, Proper and in advance material procurement and management, On time payment to the workers, Systematic flow of work, Proper, clearly and in time supervision , Advance site layout, ,Maintain work discipline, Facilities to the labourers, Clearance of legal documents before starting of work, Systematic planning of funds in advance, Preman soon plan to avoid work stop, Maximum use of machinery and automation system, Advance equipment planning**.**

Supervision on Construction Site

Jimoh *et al.* (2017) defined supervision as a technique used to enhance developing the staff, and helps to equip the workers with the professional knowledge and skills necessary to do their job effectively, also gives the entire project team opportunity to communicate, coordinate, and cooperate within one another. Their study further lamented that supervisory works have become more complex and demanding, it requires professional and interpersonal skills. Supervision is the process of overseeing the ability of people to meet the goals of the organization in which they work (Salisu 2016).

Need for supervision on construction site

Construction productivity mostly depends on the performance of construction workers (Jergeas, 2009). However, most supervisory visits may be focused on inspection and fault-finding rather than providing workers the opportunity to improve their performance and solve problems during service delivery (Zimstat, 2014). The study of Zimstat (2014) revealed some reasons for effective performance and need of supervision as follow;

1. To ensure that specified standards are obtained throughout the work.
2. To ensure that works are completed within the estimated period.
3. To ensure that operators put honesty and faithfulness in their output.
4. A construction supervisor assures that the goals of the program are implemented and completed.
5. A construction Supervisor works diligently, on behalf of prospective and established project owners.

Supervision and productivity improvement

One way that construction supervisors can improve productivity is by determining how to influence worker's attitude, how smooth the work will flow and how much work can be accomplished (Abd-el-hamied, 2014). A good leadership and supervision in construction projects increased the productivity through decreasing production costs, reducing time required for the operation, improving profit, improving the quality of product and increasing the utilization of resources (Aberey *et al.,* 2014). Abd-el-hamied (2014) stated that the cycle for productivity improvement involves four phases: productivity measurement, evaluation, planning and improvement.

Factors Affecting Effective Supervision on Construction Site

A study conducted by Brent and Leighton (2014) established 10 most significant factors affecting construction productivity and they include; lack of materials, incomplete drawings, incompetent supervisors, lack of tools and equipment, absenteeism, poor communication, instruction time, poor site layout, inspection delay and rework. Earlier, Dozzi and AbouRizk (1993) as cited by Benviolent *et al*. (2014) stated that the factors undermining the supervision of construction workers are; construction type, scope, layout and complexity, construction methods, weather, skill of the work force, work practice, length of work day, availability of materials, incentives, degree of supervision, enabling environment, government regulations and organization size.

Attar *et al*. (2013) identified factors that affects construction productivity, and categorized them into 8 factors of internal and external. The internal constraints with five groups of factors include; project characteristics, project finance, workforce, project management and

technology process. While the external constraint with three groups of factor are unforeseen events, statutory compliance and other external forces. According to Saurav *et al.* (2018), factors affecting construction supervision on labour productivity can be grouped into 15 categories according to their characteristics, namely; design factors, execution plan factors, material factors, equipment factors, labour factors, health and safety factors, supervision factors, working time factors project factors, quality factors, financial factors, leadership and coordination factors, organization factors, owner consultant factors and external factors.

1. Comparison of Labour Productivity of finishing works with Supervision and those without Supervision

According to Saurav *et al.* (2018), productivity of projects is measured by rewarding, controlling and monitoring the performance, and to do the benchmarking to set the firm's future strategy that to be aligned to the basic objective of enhancing profit through supervision. The success of any project is repeatable and it is possible to find out a set of certain success attributes for the success of a construction project and it requires a controlled discipline hardworking supervision (Mendal *et al.,* 2018).

Construction site supervision is a crucial element. The inability of many supervisors to plan the work, communicate with workers, and direct activities adequately is fundamentally linked to increasing amount and cost of rework and other quality issues (Olagunju *et al.*, 2013). Site without supervision results in defective building construction which not only contributes to the final cost of the product but also to the cost of maintenance, which can be substantial (Adamu *et al.,* 2011). It was further revealed that defective construction may lead to the complete failure of a structure.

Completing projects in a predictable manner of time (within schedule) is one of the important indicators of supervision on project success (Shahab *et al.*, 2018). Ghoddousi and Hosseini (2012) revealed that accurate scheduling can be achieved by hiring experienced personnel to supervise the work, to do planning, and using the historical data of similar projects to make an accurate estimation of the required time for each activity. Organizational success is dependent upon members being supervise or motivated to use their full talents and abilities, and directed to perform well in the right areas (Osabiya, 2015).

2. Measures for Ensuring Effective Labour Productivity

Supervisors encourage workers to adopt good practices in order to achieve a high level of performance and such 'supportive' supervision is significant and more beneficial to productivity of construction workers (Jimoh *et al.,* 2017). The benefits of supervision on construction workers using limited resources remain uncertain, even though the quality of supervision may be a key determinant of its impact on productivity (Merrow *et al.,* 2009). Fischer (2009) concluded that the impact of management styles and techniques on workers' productivity is significant through exercising power that leaders (supervisors) are able to influence others, this power can lead to one of the following reactions; commitment, compliance or resistance which affects productivity.

Supervisors may influence productivity through their decisions after their study and observation for the productivity measurement and evaluation. Fischer (2009) implied that effective delegation of responsibilities and management of required number of workers by the supervisors will give better performance and increase in productivity. Frimpong *et al*. (2011) stressed that supervision increases worker's empowerment, time management, fewer complaints and more positive feedback. A study carried by Chigara and Moro (2014) listed

four categorized ways to improve labour productivity through management practices. These strategies include; planning, resource supply and control, supply of information and feedback, and selection of the right people to control certain factors. Nevertheless, labor productivity still needs improvements.

According to Osabiya, (2015), suggested that different types of reward practice may more closely complement different generic strategies and are significantly related to higher levels of perceived labour output. With a positive motivation philosophy and practice in place, productivity, quality and service should improve because motivation helps people towards achieving goals, gaining positive perspective, creating the power for change, building self-esteem and capability, and managing their development and helping others (Moselhi 2010).

RESEARCH METHODOLOGY

This research will basically employ the use of survey design method using the quantitative approach through a well-structured questionnaire to assess the influence of supervision on labour productivity of finishing works in Ibadan, Oyo State. The research employed a quantitative approach with the use of personal observation and survey questionnaire. Personal observation was made on 10 construction sites with professional supervision and another 10 site without professional supervision. The research data were collected with the aid of well-structured questionnaires. Also 50 questionnaires were administered to construction project contractors, project managers, supervisors and foremen of small and medium construction firms. The response rate of the questionnaires was 94%. The structured questionnaires employed to gather information for the study was designed using the five-point Likert Scale format. MIS and T-TEST were employed to analyse the data collected in order to achieve the research objectives. The use of MIS for the analysis of data in this study is based on the formula.

$$\text{MIS} = \frac{\Sigma W}{N} \qquad (2)$$

Where: Σ = Summation of the weight, W= Population x scaling factor (5, 4, 3, 2, 1) and N = Total number of respondents that professionals questionnaire was administered.

DECISION RULE TABLE

The decision rule employed for the T-TEST and MIS analysis is summarized in Table 1

Scale	Interpretation					
	MIS	t-test	Frequency of Occurrence	Level of Importance	Level of Significance	Level of Effectiveness
5	4.51- 5.00	If p value < 0.05; difference is significant. But if p value > 0.05; difference is not significant.	Very often	Very Important	Very Significant	Very Effective
4	3.51 - 4.50		often	Important	Significant	Effective
3	2.51 - 3.50		Fairly often	Fairly Important	Fairly Significant	Fairly Effective
2	1.51 – 2.0		Less ;ften	Less Important	Less Significant	Less Effective
1	1.00- 1.50		Rarely	Least Important	Least Significant	Least Effective

RESULTS AND DISCUSSION

Results on Factors Affecting Effective Supervision on Construction Site

This section presents and discusses the MIS results of the factors affecting effective supervision on construction site, which 24 factors were identified. The MIS results are presented in Table 2.

Table 2: MIS Ranking on Factors Affecting effective supervision on construction site

S/No.	Factors Affecting Effective Supervision on Construction Site	MIS	Rank	Decision
1	Lack of adequate equipment	3.98	1ST	High
2	Construction training	3.32	2nd	Neutral
3	layout and complexity	3.30	2nd	Neutral
4	Technology	3.09	4th	Neutral
5	Change of labour and staff wages	3.40	5th	Neutral
6	Weather condition	3. 04	5th	Neutral
7	Inspection delay and rework	2.89	7th	Neutral
8	Construction type	2.89	7th	Neutral
9	Availability of materials	2.87	9th	Neutral
10	Skill of the work force	2.85	1oth	Neutral
11	Instruction time	2.82	11th	Neutral
12	Incompetent supervisors	2.79	12th	Neutral
13	Work practice	2.77	13th	Neutral
14	Lack of material	2.70	14th	Neutral
15	Absenteeism	2.64	15th	Neutral
16	Poor site layout	2.64	15th	Neutral
17	Length of work day	2.60	17th	Neutral
18	Incentives	2.57	18th	Neutral
19	Project uniqueness	2.55	19th	Neutral
20	Poor communication	2.51	2oth	Neutral
21	Enabling environment	2.47	21st	Low
22	Degree of supervision	2.47	21nd	Low
23	Compliances with government regulation and organization size	2.45	23rd	Low
24	Incomplete drawing	2.36	24th	Low

Source: Data analysis (2019)

It was revealed that the most commonly adopted factor for effective supervision on construction site is Lack of adequate equipment" with of MIS=3.98. The 2nd ranked is "Construction training" with MIS=3.32. The 3rd ranked is'' layout and complexity" with MIS= 3.30. The least two ranked factor affecting effective supervision construction site are Compliance with government regulation and organisation sizes" with MIS=2.45, and "Incomplete drawing" with MIS=2.36). The result is in line with Brent and Leighton (2014) findings that some factors must be considered by construction manager in order to achieve project objectives. Some of these factors include the following: project uniqueness, technology, management, labour organization, real wage trends, and construction training.

Results on Measures for ensuring effective labour productivity

This section examines the measures for ensuring effective labour productivity. These was ranked using MIS in order of importance. Tables 3 give summaries of the results of measures for ensuring effective labour productivity.

It was revealed that the commonly adopted measures for ensuring effective labour productivity. Commitment to work" with of MIS=3.77, The 2nd ranked is "Selection of the right people to control certain factors" with MIS=3.13, the next 3rd ranked is'' Proper management of tools, equipment, and minerals" with MIS= 3.30, and The least two ranked measures for ensuring effective labour productivity are Adequate supervision" with MIS=1.79, and "Resources supply and control" with MIS=1.74).

The result is in line with Fischer (2009) findings that stated that some measures must be considered by construction manager in order to achieve project objectives, such as impact of management styles and techniques on workers' productivity is significant through exercising

power that leaders (supervisors) are able to influence others, this power can lead to one of the following reactions; commitment, compliance or resistance which affects productivity.

Table 3: MIS Ranking on measures for ensuring effective labour productivity

S/N	Measures put in places for effective labour productivity	Mean	Rank	Decision
1	Commitment to work	3.77	1ST	High
2	Selection of the right people to control certain factors	3.47	2nd	Neutral
3	Proper management of tools, equipment, and minerals	3.13	3rd	Neutral
4	Planning	2.87	4th	Neutral
5	Fewer complaints and more positive feedback	2.45	5th	Low
6	Encouragement of workers by the supervisors	2.45	5th	Low
7	Management styles and techniques on workers production	2.21	7th	Low
8	Positive motivation philosophy and practice in place	2.oo	8th	Low
9	Compliance with supervisor instruction	1.98	9th	Low
10	Effective delegation of supervisors	1.98	9th	Low
11	The relative efficiency of labour doing what it is required to do at a given time and place	1.85	11th	Low
12	Time management	1.83	12th	Low
13	Supply of information and feedback	1.81	13th	Low
14	Adequate supervision	1.79	14th	Low
15	Resources supply and control	1.74	15th	Low

Source: Researcher' Analysis (2019)

Results on Site Observations and Measurements

Test of difference between Productivity with professional supervision and without professional supervision

Table 4. Shows the result of the t-test analysis performed to compare the difference between productivity with professional supervision and without professional supervision. It was apparent from the analysis that the value of t-calculated (0.098) was less than the value of t-tabulated (1.81); and the probability value (0.020) was lower than 0.05 (5%) level of significance and within 95% confidence level. The evidence is statistically significant. The result implies that there is statistically significant difference between the site with supervision and those without supervision

Table 4: Test of difference between Productivity with professional supervision and without professional supervision

S/n	Variables		Type of analysis	Observation			Inference	
	X1	X2		T-cal	T-tab	P value	Remark	
1	Productivity with Professional Supervision	Productivity without Professional Supervision	T-test	1.148	1.81	0.098	There was statistically Significant between **X1** and **X2**	

Source: Researcher's Field work, 2019

CONCLUSION

Labour is a key resource on building projects and effective management of the resource to achieve optimal productivity cannot be over emphasized. This study has brought into focus on influence of supervision on labour productivity on finishing works. After a series of extensive literature review and findings, the result brought forth the following conclusions:

Lack of adequate equipment is the most important factor leading to effective supervision on construction sites, therefore adequate equipment should always be provided in order to improve construction on site. Commitment is the most measures put in place by supervisors in ensuring effective labour productivity, therefore all professionals should be fully committed to each activities he/she engaged. The research also found that there was statistically significant difference between labour productivity of the site with supervision and those without supervision. This shows that those site with supervision generate more output than those without supervision with 8% differences.

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