

# Trends in Performance Improvement of Bricklayers in the Nigerian Construction Industry

Fagbenle Olabosipo I., Tunji-Olayeni Patience F.,  
Joshua Opeyemi, Ojelabi Rapheal A.  
Department of Building Technology  
Covenant University  
Ota, Nigeria  
olabosipo.fagbenle@covenantuniversity.edu.ng

Fagbenle Ayoola O.  
Department of General Studies  
Osun State College of Technology  
Esa-Oke, Nigeria  
olafagbenle@yahoo.com

**Abstract**—High performance is regarded as a goal that ensures long term survival of firms and block/brick is acclaimed as one of the primary construction materials all over the world. The craftsmen in this trade also play an important role towards achieving this task. Therefore, a survey of 120 construction sites were conducted in the years 2004, 2010 and 2014 to identify the areas with the need for performance improvement of bricklayers in construction industry. With a focus on six states from the six geo-political zones in Nigeria, the trends in the findings of this survey among 360 bricklayers were observed and interpreted. The result indicated that provision of working tools and equipment, transport to and from sites, reward systems based on ability and productivity, safety plans including provision of protective devices and first aids as well as finish and go (no delay after day's work) were variables that consistently perceived as need for performance improvement over the years. The variables that were identified as requiring more improvement in the recent year (2014) compared with the previous years were employees' training and development, job security and employee turnover, quality control, incessant rework and estimating errors, material shortage, delay and wastage as well as labour availability. Those that need less improvement compared to the previous years were access to soft loan from establishment and end of the year cocktail party and award nights. It was concluded that priority attentions should be shifted towards the identified variables for an improved construction performance of these craftsmen as a developmental strategy in this sector.

**Keywords**—Bricklayers; Construction Industry; Nigeria; Performance Improvement; Trends

## I. INTRODUCTION

Studies on the performance of construction products and operatives are usually of great concern to scholars and policy makers all over the world. This has been confirmed via the works of many researchers such as [1], [2], [3], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13], [14], [15]. According to Seeley (1996; cited in [2]), the traditional project performance measures of cost, time and quality are frequently used to assess contractors' performance by clients.

Sidwell (1983; cited in [2]) identified factors influencing project time performance and concluded that client's experience, form of building, labour force, form of building procurement and project organizational structure are elements of a complex casual factor of project time performance.

In a similar development, Sink (1985; cited in [2]) identified seven dimensions of organizational performance: effectiveness; efficiency; quality; productivity; quality of work; innovation and profitability. [16] believed that the performance of a construction management team is influenced by internal and external factors which were synchronized as project, environment and management related. [6] also identified seven areas of performance improvement of construction contractors in the United States as: management; materials; engineering; construction techniques; regulations; labour; and equipment. These were further broken down into: materials (procurement, delivery, storage, packaging, prefabrication, standardization, product availability and new products); management (office management, estimating, cost control, scheduling, resource allocation, integration of design/estimating/scheduling/control functions, field inspection, safety management and marketing communications); engineering (design standards, design practices, systems engineering, drafting, specifications and value engineering); regulations (local codes); construction techniques (precast elements, pre-assemble modular and foreign developments); labour (turnover, availability, working hours and labour relations, contract agreement, training and quality control); and equipment (replacement analysis, capacity, simplicity, maintainability, utilization and use of robots).

Adeyemi (2000; cited in [4]) observed the presence of a number of demotivators in the Nigerian construction industry, which are clogs to performance improvement. The ones having direct bearing with operatives' improvement are identified as: inappropriate tools and equipment breakdown; material shortage, delay and wastage; incessant rework and estimating errors; absence of training and safety programmes; job insecurity/employee turnover; non involvement of construction crews in production objective; incompetent foremen; and predominance of Maslow's theory X site managers. [17] researched into the management of labour in Kenyan construction industry and identified some factors suspected to be negatively affecting labour performance in the Kenyan construction industry. [2] also examined how the factors perceived to be negatively affecting labour's performance vary from site to site in Nigerian construction industry. [6] observed the trends in productivity improvement of contractors in the United States' construction industry.

The objective of this study is to determine the potential areas which need performance improvement of bricklayers in the Nigerian Construction Industry.

## II. RESEARCH METHODOLOGY

Primary data were collected through questionnaire survey and direct field observations. The study samples were randomly drawn from 360 bricklayers in one hundred and twenty construction firms within the six geo-political zones in Nigeria (South-West, South-East, South-South, North-West, North-East, and North-Central). One state each from the six geo-political zones of the country was selected for the site visitation. They are: Lagos (south-west); Anambra (south-east); Delta (south-south); Kaduna (north-west); Katsina (north-east); and Niger (north-central). The surveys were conducted in the years 2006, 2010 and 2014 with a primary aim of identifying the areas that need the performance improvement of bricklayers in the construction industry in Nigeria. Forty sites were visited in which one hundred and twenty bricklayers were observed in each of the year. The essence of this was to achieve homogeneity of response and comparative analysis. The illiterate respondent among the bricklayers were however guided by reading out the content of the questionnaire to them and their responses carefully inputted. Research assistants who were postgraduate students in the built environment were employed for this exercise. Two set of questionnaires were distributed: to the bricklayers and to contractors.

In the first instance, general characteristics of construction firms and the respondents were elicited. They include: nature of the firms; annual turnover; geographical spread; number of permanent employees in the firm; number of equipment owned and/or leased; registration with the Federal Registration Board of Nigeria; years of experience of the respondents; years of working experience of respondents with the company; provision of working tools to the employees by the company, etc. Secondly, respondents were asked to identify the most fertile areas requiring performance improvement. These were also stratified into eight categories: management; materials; engineering; construction techniques; regulations conformity; labour related; tools/equipments; and incentives. Each category comprises a set of micro functions as follows: management (estimating, cost control, scheduling, field inspection, safety management and communicating structure); materials (procurement, delivery, shortage, storage, standardization and product availability); engineering (design standards, design practices and specifications); construction techniques (precast elements and new methods); regulations conformity (government regulations, company regulations, health and safety measures); labour related (availability, turnover, contractual agreement, quality control, training and retraining, and rework; tools/equipment (capacity, availability, access, simplicity and maintainability); and incentives (transport to and from sites, reward system based on ability and performance, safety plans, finish and go, provision of recreation and relaxation centers, end-of-the-year cocktail party and award night, overtime payment and employee insurance). These eight macro variables were then named VAR1, VAR2, VAR3...VAR8 respectively for factor analytical technique [18]. The coefficients were further subjected to matrix correlation/importance statistical analysis to determine the

variables that need performance improvement in this regard. The coefficient that is greater or equal to 0.500 indicates a high level of co-variation between variables involved and also indicates a considerable room for performance improvement in a particular variable/function. Also, a coefficient ranging between 0.499 and 0.201 shows a moderate level form for improvement while those between 0.100 and 0.200 indicates a relatively level of correlation/improvement.

## III. DATA ANALYSIS AND DISCUSSION

Table 1 shows the correlation matrix of the linear relationship between the variables and also indicates the importance level attached according to the bricklayers while Table 2 depicts the management's perception of the rating.

The results obtained in Table 1 indicate that all the variables have high degree of positive relationship with one another. This is a confirmation of the validity of interdependence of these variables (functions) in the review. The score of the relationship between labour-related matters and incentive application had the highest positive association (.796) in the 2006 survey. Similar associations (.700 and .806) were recorded in the years 2010 and 2014 respectively. It is an indication that an improvement in the performance of bricklayers will necessitate an improvement in the application of the various incentive schemes as earlier indicated. Little wonder that the figures kept increasing with increase in the survey years. This also indicates the urge of this variable as a potential area for performance improvement of bricklayers. Also, the relationship between management and provision of tools/equipment showed high positive associations (.711, .723 and .727) respectively in the three surveyed years. This signposts the essentials of sophisticated tools and equipment as a bedrock of result-oriented performance. It also situates tools/equipment as potential area for improvement among the bricklayers. This supports the views of [4] and Adeyemi (2000; cited in [4]) that inappropriate tools and equipment are clogs in the wheel of progress of productivity improvement in the construction industry.

The results of 2014 survey in comparison with the year 2010 depicted a slightly high level of association between labour matter and materials (.709) as against a figure of .607 in the previous year. This also puts material availability as a potential area for performance improvement of bricklayers. The lowest figure recorded is the association between management related and engineering (.501). While this is still considered as falling within the range of potential areas for performance improvement, the reason for the low figure might not be unconnected with the technicalities involved in this component when compared with the technical level of the respondents (bricklayers).

Similar trends were observed in the management's response (Table 2) except in the relationship between managerial and engineering which showed relatively higher association figure of .762, .765 and .768 in years 2006, 2010 and 2014 respectively in comparison with the bricklayers' version (.501, .503 and .507) respectively. This is not unconnected with the premium attached to engineering development by the management as a measure for construction sustainability and business growth. Engineering development and sophisticated

construction techniques are vital ingredients that must not be go into extinction in the construction business. downplayed by any construction company that does not want to

Table 1: Matrix of Correlations/Improvement Potential Indices (Bricklayers' Response)

Variables	2006 Survey								2010 Survey								2014 Survey							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	1.00								1.00								1.00							
2	.578	1.00							.581	1.00							.583	1.00						
3	.501	.576	1.00						.503	.578	1.00					.507	.523	1.00						
4	.556	.533	.590	1.00					.556	.545	.590	1.00				.561	.552	.590	1.00					
5	.511	.573	.549	.601	1.00				.507	.572	.592	.601	1.00			.521	.584	.590	.601	1.00				
6	.517	.607	.605	.613	.570	1.00			.521	.601	.601	.613	.581	1.00		.551	.704	.613	.625	.591	1.00			
7	.711	.692	.633	.593	.611	.620	1.00		.723	.703	.633	.593	.621	.621	1.00	.721	.714	.643	.603	.631	.621	1.00		
8	.771	.763	.691	.711	.716	.792	.720	1.00	.781	.703	.711	.773	.791	.791	.731	1.00	.788	.712	.711	.799	.796	.803	.763	1.00

Table 2: Matrix of Correlations/Improvement Potential Indices (Management's Response)

Variables	2006 Survey								2010 Survey								2014 Survey							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	1.00								1.00							1.00								
2	.571	1.00							.577	1.00						.578	1.00							
3	.762	.572	1.00						.765	.570	1.00					.768	.570	1.00						
4	.557	.533	.590	1.00					.559	.533	.590	1.00				.561	.533	.590	1.00					
5	.516	.574	.551	.590	1.00				.521	.576	.551	.601	1.00			.532	.576	.551	.611	1.00				
6	.516	.619	.609	.607	.570	1.00			.513	.613	.601	.613	.581	1.00		.551	.625	.625	.613	.601	1.00			
7	.714	.693	.633	.611	.617	.620	1.00		.716	.703	.653	.613	.613	.621	1.00	.717	.704	.653	.613	.613	.631	1.00		
8	.751	.763	.671	.691	.716	.792	.710	1.00	.771	.773	.693	.703	.711	.791	.711	1.00	.781	.784	.703	.703	.711	.803	.723	1.00

#### IV. CONCLUSION

An analysis of the trends in performance improvement of bricklayers in the Nigerian construction industry in the years 2006, 2010 and 2014 has been demonstrated. It is concluded that a more purposive attention should be geared towards the provision of working tools and equipment, viable transportation system, virile reward scheme and elimination of

hidden policies for an appreciable improvement in the performance of bricklayers to be achieved in the construction industry in Nigeria. Of equal importance are also employees' training and development, quality control and elimination/drastring reduction of incessant rework, estimating errors, material shortage, delay and wastage as well as labour availability. It is also suggested that this trend is performed on other craftsmen in the construction industry as well as its application to other nations of the world.

## REFERENCES

- [1] P. Tunji-Olayeni, T. O. Mosaku, O. I. Fagbenle, I. O. Omuh, O. Joshua, "Evaluating Construction Project Performance: A Case of Construction SMEs in Lagos, Nigeria", Proceedings of the 23<sup>rd</sup> IBIMA Conference on Creating Global Competitive Economies:2020 Vision Planning & Implementation, Rome, Italy, 13 – 14 November, 2014, pp 3116 – 3128.
- [2] O. I. Fagbenle, A. O. Ogunde, and J. D. Owolabi, "Factors Affecting the Performance of Labour in the Nigerian Construction Sites", Mediterranean J. of Social Sciences, Mediterranean Centre of Social and Educational Research, Italy, Vol. 2, No. 2, 2011, pp 279 – 286.
- [3] S. O. Ojo, "An Identification of Clients' Needs for Building Projects: A Nigerian Study", Ife J. of Environmental Design and Management, O.A.U, Ile-Ife, vol. 2, no. 1, 2009, pp
- [4] O. I. Fagbenle, A. Y. Adeyemi, and D. A. Adesanya, "The Impact of Non-Financial Incentives on Bricklayers' Productivity in Nigeria", Construction Management and Economics, University of Readings, U.K, 22, 2004, pp 899 – 911.
- [5] M. O. Dada, "Perceptions on Measures of Contracting/Contractor's Performance: A Lagos State Survey of Nigerian Indigenous Contractors", Proceedings of 1<sup>st</sup> International Conference on Global Construction, 2003, pp 59 – 68.
- [6] D. Arditi and K. Mochtar, "Trends in Productivity Improvement in the U.S Construction Industry", Construction Management and Economics, University of Readings, U.K, 18, 2000, pp 15 – 27.
- [7] D. K. Chimwaso, "An Evaluation of Cost Performance of Public Projects: Case Study of Botswana", Proceedings of 2<sup>nd</sup> International Conference on Construction in Developing Countries, CIB Task Group 29, University of Botswana, 15 – 17 November, 2000, pp 50 – 65.
- [8] O. I. Fagbenle, "The Use of Large Unskilled Labour Force for Non-Traditional Residential Projects in Nigeria", Unpublished Seminar Paper, Dept. of Building, O.A.U, Ile-Ife, Nigeria, 1997.
- [9] Z. Z. Hartush and M. Skitmore, "Criteria for Selection", Construction Management and Economics, University of Readings, U.K, 15, 1997, pp 19 – 38.
- [10] J. D. Campbell, Uptime: Strategies for Excellence in Maintenance Management, Productivity Press, Cambridge, M. A, 1995.
- [11] K. A. Wahab, "Satisfying the Training Needs of Management and Staff in the Construction Industry", Proceedings of the National Seminar on Effective Contract Management in the Construction Industry, The Nigerian Institute of Building, Lagos, Nigeria, August 1991, pp 80 – 107.
- [12] A. A. Hussein, "The Importance of Manpower Training and Management to the Construction Industry", Proceedings of the National Seminar on Effective Contract Management in the Construction Industry, a. b. d, 1991, pp 113 – 131.
- [13] N. A. Parker, N. M. Lema, and O. Mligwa, "Analysis of Labour Productivity in Tanzania, University of Dares Salam and National Construction Council, 1986.
- [14] D. Sink, Productivity Management, Planning, Measurement, Evaluation Control and Improvement, Wiley and Sons, New York, USA, 1985.
- [15] A. C. Sidwell, "An Evaluation of Management Contracting", Construction Management and Economics, University of Readings, U.K, 1, 1983, pp 132 – 143.
- [16] R. L. Chauchan and W. C. Chiang, "Weighting Factors in Construction Management Performance Evaluation", Proceedings of International Conference on Applied Construction Management, University of NSW, Sydney, February 1989, pp 137 – 145.
- [17] I. N. Wachira, "Labour Management in Kenya", Proceedings of 2<sup>nd</sup> International Conference of CIB Task Group 29, a. b. d, 2000, pp 100 – 104.
- [18] L. Oduwaye, "Spartion Temporal Planning Implications of Changing Land Use Structure of Metropolitan Lagos, Nigeria", The Lagos J. of Environmental Studies, University of Lagos, Lagos, Nigeria, vol. 6, no. 1, 2009, pp 71 – 84.

