The Influence of Training on Bricklayers' Productivity in Nigeria

By

*Fagbenle, Olabosipo I[1].Lawal Phillip O[2]. And Omuh, Igartius O[3].

1) Department of Building Technology Covenant University, Ota, Nigeria.
E-mail: olafagbenle@yahoo.com.
2) Department of Quantity Surveying, Caleb University, Imota, Lagos, Nigeria.
E-mail: lawalp4christ@yahoo.co.uk.
3) Department of Building Technology, Covenant University, Ota, Nigeria.
E-mail: iomuh@yahoo.com.* Corresponding Author

ABSTRACT

The global economic situation and the need for construction contractors to remain in business in this competitive environment have made productivity improvement more and more important. This study therefore investigated the impact of formal and informal trainings on the productivity of bricklayers in three commercial nerve centres of Nigeria (Lagos, Abuja and Port Harcourt).To achieve this, questionnaires, backed up with interviews and on-site measurements were conducted on the management and bricklayers of construction firms who were randomly drawn from the three categories of construction firms in the country (large-sized, medium-sized and small-sized firms). 90 and 180 structured questionnaires were distributed to the management and bricklayers in the study area while 72 and 118 questionnaires were respectively filled and returned in this regard. The results of the descriptive and inferential statistical techniques indicated that training had significant effect on the productivity of bricklayers in Nigeria. Other factors such as monetary and non-monetary incentives, planning and control, organizational strategy, supervision aspects and general management also had their contributory effects to bricklayers' productivity. The study concluded that the issue of training should be accorded a priority attention by the managements of construction firms in order to attain greater workers' productivity on construction sites.

Keywords: Bricklayers, Influence, Nigeria, Productivity, Training.

1.0 INTRODUCTION

The construction industry in Nigeria is labour intensive and it is the highest employer of the nation's work force. The industry also accounts for over 50% of the country's gross capital formulation (Fagbenle, Adeyemi and Adesanya, 2004). In the words of Olatunji, Ajibola and Coker (2000), the largest share of investment capital in all developing countries still finds its way into construction. Unfortunately, the most empirical studies have revealed that the input of the industry in Nigeria is quite low

when compared with many developing countries (Fagbenle, et al., 2004 and Olatunji, et al., 2000). Realising this fact however, many studies had been channelled to the challenge of productivity in the Nigerian Construction industry. For instance, Olateju, et al., (2000) studied the effect which training had on the productivity of construction artisans in south-western Nigeria. Also, Lawal and Kolawole (2004) investigated the productivity of the Nigerian public service construction artisans while Olatunji et al. (2000) studied the effects of training on the performance of construction craftsmen in south-western Nigeria. These studies revealed that Nigeria is having a myriad of construction productivity challenges, which is typical of most developing countries. They argued further that little or no success resulted from every attempt to proffer solutions to these challenges.

However, a number of studies (Jergeas, 2009; Fagbenle, et al., 2004; Callaham, 1984; Mahoney, 1983; Bocherdings, et al., (1982); Choromokas and Mikue, 1981 and Bercherdings, 1976) have attributed this low productivity to the presence of demotivators (dissatisfiers). According to these authors, motivators (job enrichment) cannot manifest in an improved productivity unless these motivators are removed. Adeyemi (2000) observed the presence of a number of demotivators in the Nigerian construction industry which have been impeding the productivity improvements. They are identified as follows;

- Inappropriate tools and equipment breakdown
- Incessant rework and estimating errors
- Absence of training and safety programmes
- Job insecurity/ employee turn-over
- Non-involvement of construction crews in production objectives
- Incompetent foremen
- Predominance of Maslow's Theory and site managers

Liberda et al., (2003) identified the relative importance of fifty one productivity factors which were classified into three groups as: Human, External and Management. According to these authors, human factors include workers' boredom and fatigue, workers' attitude and morale, workers' physical limitations, workers' absenteeism, workers' experience, workers' skill and the team spirit of the crew. External factors include union rules and influences, adverse weather conditions, noise, dust, radiation, congested work area, change in drawings and specifications, changes in contract, demand for over-quality work and the nature of project (size and

complexity). Management factors cover such aspects as protective gear, unrealistic schedules, overtime, multiple shifts, disrespectful treatment of workers, salary and benefits, incompetent personnel, overcrowded work areas, poor inspection programme, unsafe working conditions, inadequate equipment, inadequate supervision, crew composition, constructability, interruption and disruption, lack of

cooperation between crafts, inadequate communication, lack of workers training and education, cleanliness of construction site, changes in foremen, lack of detailed planning, and non-availability of information, materials, tools and equipment.

Zhou (2004) conducted a study on motivating construction management professionals and operatives. He concluded that motivation, when it is combined with work experience and education (training) is an important factor in improving performance. Hewage (2007) conducted another research as a prelude to Liberda et al. (2003)'s work. The fifty one identified factors affecting productivity were then prioritized and clustered into nine categories. Three categories are design and changes, workers' motivation, inadequate communication, workers' skills, non-availability of information, lack of planning, congested work areas, inadequate supervision and adverse weather conditions. Jergas (2009)'s work performed in Canada indicated that construction productivity largely depends on the performance of the construction workers. According to the author, the improvement in construction productivity needs to be achieved through greater resource allocation and human resource efficiency, effectiveness and engagement as well as increased innovation and technology.

A curious look at the aforementioned identified variables of demotivators in the construction industry have no doubt brought to the fore the importance of training in the productivity improvement of any economy. Training has been defined as an activity which is concerned with making employees more articulate and efficient in the performance of their current tasks or in preparation for a new type of job, to meet the dynamic needs of the organization (Wahab, 1992). Training can be used to develop mental ability, dexterity and skills of personnel at all levels. Hussein (1992) identified three avenues of training for the skilled labour as the school avenue such as vocational training college, the workshop avenue and the field avenue. Olatunji et al., (2000) further identified the types of training as induction training, on-the-job training, refresher training, skill upgrading, practical demonstration and further education (in-service training).

While accepting the fact that some works had been done in the area of training and its effect on productivity, all the sample sizes were based on the generality of craftsmen in the construction industry thereby not allowing for a thorough investigation. Moreover, none of the works was backed up with any site measurements. This paper therefore addressed the issue of formal and informal trainings in the Nigerian Construction industry and their impact on bricklayers' productivity.

2.0 METHODOLOGY

The data for the study were obtained through questionnaire administration and direct field measurements/observations. The study samples were randomly drawn from large, medium and small-sized construction firms in three commercial nerve centres of the country namely, Lagos, Abuja and Port Harcourt. The essence of the classification was to ensure homogeneity of response and comparative analysis. The sample size was selected because more than 75% of the volume of construction activities in the country takes place in these cities. Moreover, the register of the Nigerian construction contractors with the Federal Registration Board of Nigeria indicated that more than 80% of the construction firms have addresses of these three cities (Fagbenle et al., 2004, Olaleye, 2008). It is hoped that these areas would form a general and true representation of what is obtained on the whole country. Two sets of questionnaires were prepared (one for the management and the other for the masons). 90 and 180 questionnaires were respectively administered on the management and masons(bricklayers) in the study area. 72 and 118 questionnaires were filled and returned in this perspective. The decision to focus on masonry trade in preference to other trades lies on the predominance of bricks/blocks as one of the major construction materials in Nigeria. From this trade, seven work-packages were studied. They are: laying of 150mm sandcrete blocks; laying of 225mm sandcrete blocks; concreting ground floor slab; casting upper floor slab (all barrowed); casting upper floor (all craned); casting beams and columns; and plastering/rendering.

Ratio 1:2:3 was used for the distribution of questionnaires to the large-sized, medium-sized and small-sized firms in this regard. Based on this, 15, 30 and 45 questionnaires were distributed to the management of large, medium and small-sized firms while the bricklayers distribution was 30, 60 and 90 questionnaires respectively. Research assistants were employed to administer and assist the bricklayers on sites to interpret the questionnaire. The multi-lingual nature of Nigeria has no doubt compelled the craftsmen to communicate well enough in English language (or at least Pidgin English) in order to have meaningful interaction in this sector of the national economy.

In order to determine the premiums placed on each of the identified types of training by the two categories of respondents, the scoring system is set as 3,2 and 1 points for high, medium and low ratings respectively. The mean score(s) for each function is calculated by means of the following equation (Arditi and Mochtar, 2000):

$$S = \frac{3h + 2m + l}{h + m + l}$$

Where S is the mean score, h is the percentage of respondents that gave a “high” rating to the identified variable, m is the percentage of respondents that gave a

"medium" rating and l is the percentage of respondents that gave a "low" rating to the variables.

On-site observations and measurements were also conducted on bricklayers in thirty construction sites in the study area to complement the information elicited from the questionnaire distribution. Notable forms of training programmes were being run by the management of the first fifteen construction sites while these programmes were absent in the second fifteen sites. For the purpose of identification, the first fifteen sites would be named and referred to as sites I to XV while the second fifteen would be referred to as sites XVI to XXX.

3.0 RESULTS AND DISCUSSIONS

In presenting the results of the questionnaire survey, the paper first highlighted the questionnaire's distribution and the response rates in the three categories of the sites visited.

3.1 Questionnaire Distribution and Response Rates in the Study Area

Tables 1 and 2 showed the numbers of the questionnaires distributed and the response rates in the three site categories for both management and the bricklayers respectively.

Table 1: Questionnaires Distributed and Collected in the Three Site Categories (Management)

Study Area	Questionnaires Distribution				Response Rates (%)			
	Large Sized	Medium Sized	Small Sized	All	Large Sized	Medium Sized	Small Sized	All
Lagos	5	10	15	30	4(40.0)	10(45.5)	15(37.5)	29(96.7)
Abuja	5	10	15	30	3(30.0)	5(22.7)	13(32.5)	21(70.0)
P/Harcourt	5	10	15	30	3(30.0)	7(31.8)	12(30.0)	22(73.3)
Total	15	30	45	90	10(100.0)	22(100.0)	40(100.0)	72(80.0)

Table 2: Questionnaires Distributed and Collected in the Three Site Categories (Bricklayers)

Study Area	Questionnaires Distribution				Response Rates (%)			
	Large Sized	Medium Sized	Small Sized	All	Large Sized	Medium Sized	Small Sized	All
Lagos	10	20	30	60	9(42.9)	17(39.5)	28(51.8)	54(90.0)
Abuja	10	20	30	60	7(33.3)	12(27.9)	13(24.1)	32(53.3)
P/Harcourt	10	20	30	60	5(23.8)	14(32.6)	13(24.1)	32(53.3)
Total	30	60	90	180	21(100.0)	43(100.0)	54(100.0)	118(65.5)

As shown in Table 1, twenty-nine out of the thirty management staff in Lagos filled and returned their questionnaires. Twenty-two respondents did same in Port-Harcourt while twenty-one people returned their questionnaires in Abuja. This represents approximate percentage rates of 97%, 73% and 70% respectively. Also in Table 2, fifty-four of the sixty respondent bricklayers filled and returned their questionnaires while thirty two respondents returned theirs from the same number of questionnaire distribution in Port-Harcourt and Abuja. This also represents approximate percentage rates of 90%, 53% and 53% respectively. The relatively higher number of response rates in Lagos might not be unconnected with the high level of awareness of construction operatives to questionnaire administration. Moreover, Lagos is referred to as the centre of excellence and the first industrial destination of choice for any investor. Based on this distribution, the paper identified the various training venues for the bricklayers and the premiums placed on each of them.

3.2 Training Avenues for Bricklayers

As shown in the table 3 below, the major training avenues for the bricklayers are field avenues in terms of apprenticeship, workshop avenue and the vocational training (school avenue). Table 4 therefore gives the mean scores of the responses in the three site categories.

Table 3: Identification and Frequency Counts of Training Avenues for Bricklayers

Training	**Management**									**Bricklayers**								
Avenues	**Large Sized**			**Medium Sized**			**Small Sized**			**Large Sized**			**Medium Sized**			**Small Sized**		
	3	**2**	**1**	**3**	**2**	**1**	**3**	**2**	**1**	**3**	**2**	**1**	**3**	**2**	**1**	**3**	**2**	**1**
Field Avenue (Apprenticeship Only)	2	5	3	7	9	6	28	6	6	6	9	6	15	15	13	34	10	10
Workshop Avenue	1	4	5	2	14	6	8	12	20	2	10	9	8	16	19	17	18	19
Vocational Training	6	3	1	12	7	3	22	8	10	9	10	2	18	18	7	30	11	13

Legend: 3-high rating; 2-medium rating; 1-low rating

Table 4: Mean Scores of Ratings Placed on the Training Avenues for Bricklayers

Training Avenues	Management				Bricklayers			
	Large Sized	Medium Sized	Small Sized	All Firms	Large Sized	Medium Sized	Small Sized	All Firms
Field Avenue (Apprenticeship Only)	1.90	2.05	2.55	2.17	2.00	2.05	2.44	2.16
Workshop Avenue	1.60	1.82	1.70	1.71	1.67	1.74	1.96	1.79
Vocational Training	2.50	2.41	2.30	2.40	2.33	2.26	2.32	2.30

The results in Table 4 indicated that vocational training avenues are highly preferred by the management of large sized and medium sized construction firms with mean scores of 2.50 and 2.41 respectively. This was followed by the field avenue (mean scores of 1.90 and 2.05 respectively) and the workshop avenue with mean scores of 1.60 and 1.82. However, management of small-sized firms attached greatest premium to the field avenue of training (Mean Score=2.55), followed by vocational training (M.S=1.70). The highest premium attached to field avenue might not be unconnected with the informal setting of the small sized firms. The large sized and medium sized firms on the other hand are more organized and formal in their arrangement and therefore cannot afford to employ any skilled worker without a formal certificate indicating proper training. This lends credence to the pilot study as well as Jergeas (2009) and Fagbenle et al. (2004)'s assertions that the competitive manner of the construction industry and the multi-lingua nature of this industry have compelled the craftsmen to have a formal form of education.

The views of the Bricklayers are not dissimilar to the management's ratings in this regard. The result therefore made it possible to examine further training programmes that are available for bricklayers in the construction industry.

3.3 Further Training Opportunities for the Bricklayers

Realizing the importance of various further training programmes on operatives' motivation and productivity, attempts were made to investigate the various further training programmes that are open for the bricklayers on construction sites. Table 5 therefore showed the premiums attached to the various further training programmes agreed to be beneficial to the bricklayers.

Table 5: Mean Scores of Premiums Attached to Further Training Programmes for the Bricklayers

Training Programmes	Management				Bricklayers			
	Large Sized	Medium Sized	Small Sized	All Firms	Large Sized	Medium Sized	Small Sized	All Firms
Induction Training	2.11	2.00	2.13	2.08	2.21	2.19	2.17	2.19
On-the- Job Training	2.52	2.55	2.61	2.56	2.51	2.59	2.61	2.57
Refresher Training	2.20	2.22	2.23	2.22	2.28	2.32	2.44	2.35
Skill Upgrading	2.17	2.35	2.32	2.28	2.41	2.49	2.41	2.44
Practical Demonstration	2.14	2.50	2.45	2.36	2.48	2.51	2.57	2.52
In-Service Training	2.59	1.62	1.65	1.95	2.10	1.97	1.78	1.95

The summary in Table 5 revealed that on-the-job training was the most preferred type of training programme available for bricklayers. Mean scores of 2.56 by management and 2.57 by the bricklayers themselves placed this training scheme above all other training programmes packaged for these skilled men. This might not be unconnected with the "learning makes perfect" principle of any work environment.

There seems to be consensus of opinions in the ranking of other training programmes by the two categories of respondents. For example, management of all firms ranked practical

demonstration second with the mean score of 2.36. The introduction of new products into the construction industry through practical demonstration might be responsible for this ranking. Skill upgrading (MS= 2.28), refresher training (MS= 2.22) and induction training (MS= 2.08) were respectively ranked third, fourth and fifth by the management of all firms.

The bricklayers on the other hand also ranked practical demonstration (MS=2.52) second and this was followed by: skill upgrading (MS= 2.44); refresher training (MS=2.35) and induction training (MS= 2.19). The least in the ranking by these two categories of respondents is in-service training. The one-off and the nomadic nature of the construction industry might be responsible for this as this factor do not favour the retention of permanent workers. Therefore, sending operatives for trainings that will consume financial and time resources are always avoided by management of these construction firms. This supports the views of Fagbenle, et al. (2004), Adeyemi (2000), Callaham (1984), Mahoney (1983) and Borcherdings, et al. (1982) that job security/employee turn-over are a major demotivator in the Nigerian construction industry which have been impending productivity improvement.

However, management of Large-sized construction firms gave highest premium to in-service training programme (MS= 2.59) while on-the-job training (MS= 2.52), skill upgrading (MS= 2.17), practical demonstration (MS= 2.14) and induction training (MS=2.11) came second, third, fourth, fifth and sixth respectively. The highest premium accorded to in-service training by the management of this category of firms might not be unconnected with the long term characteristic nature of large-sized firms. They are always confident of uninterrupted patronage by governments of nations as the largest clients in the construction industry. In view of the continuity's sake, they can afford to retain quality skilled operatives for a long period and also send them for long-time training programmes.

Having established the necessity of the various training programmes earlier highlighted, the study pressed further to find the impact of these (training) programmes on the productivity of bricklayers and the site findings are presented below.

3.4 Site Observations and Measurements

In an attempt to determine the impact of training programmes on the productivity of bricklayers in the study area, thirty construction sites were visited for the on-site observations and measurements of activities of bricklayers. As earlier mentioned, the various training programmes were visibly employed in the first fifteen sites (sites I to XV) and were absent in the other set of sites (sites XVI to XXX) and these cut across the three categories of construction sites earlier mentioned. The results in Tables 6 and 7 therefore give the summary of the findings.

Table 6: Observed Outputs per Bricklayer in an 8 hour day (Sites I to XV)

S/N	*Activities*	*Unit*	*Mean*	*Site*														
				I	*II*	*III*	*IV*	*V*	*VI*		*VII I*	*IX*	*X*	*XI*	*XI I*	*XIII*	*XI V*	*XV*
1	*Laying 150mm sandcrete*	*Nos*	*68*	*66*	*-*	*-*	*67*	*-*	*70*	*-*	*-*	*-*	*-*	*67*	*-*	*-*	*68*	*-*
2	*Laying 225mm sandcrete*	*Nos*	*63*	*62*	*-*	*-*	*64*		*63*	*-*	*-*	*-*	*-*	*63*	*64*		*63*	*-*
3	*Concreting ground flab slab*	*M^3*	*2.71*	*2.78*	*-*	*-*	*-*	*2.82*	*-*	*-*	*-*	*-*	*2.62*	*-*	*-*	*2.60*	*-*	*-*
4	*Casting upper floor slab(all barrowed)*	*M^3*	*2.57*	*-*	*-*	*-*	*2.55*	*-*	*-*	*-*	*2.59*	*-*	*-*	*-*	*-*	*-*	*-*	*-*
5	*Casting upper floor slab (all craned)*	*M^3*	*2.67*	*2.66*	*-*	*-*	*-*	*2.68*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*
6	*Floor screeding*	*M^3*	*10.58*	*11.21*	*-*	*-*	*-*	*10.22*	*-*	*-*	*-*	*-*	*10.38*	*-*	*10.51*	*-*	*-*	*-*
7	*Wall plastering/rendering*	*M^3*	*9.65*	*-*	*-*	*9.97*	*-*	*9.53*	*-*	*-*	*9.45*	*-*	*-*	*-*	*-*	*-*	*-*	*9.63*

Mean Observed Output = Summation of all Observed output per site

Number of Men Observed

Table 7: Observed Outputs per Bricklayer in an 8-hour Day (Sites XVI to XXX)

S/N	Activities	Unit	Mean	Sit														
				XVI	XVII	XVII	XIX	XX	XXI	XXII	XXIII	XXIV	XXV	XXVI	XXVII	XXVIII	XXIX	XXX
1	Laying 150mm sandcrete blocks	Nos	66	-	65	64	-	-	66	-	67	-	66	-	-	67	-	-
2	Laying 25mm sandcrete blocks	Nos	62	61	-	62	-	60	-	62	-	63	-	-	-	62	-	-
3	Concreting ground floor slab	M^3	2.71	-	2.67	-	2.77	2.73	-	-	2.71	-	-	-	-	-	-	2.70
4	Casting upper floor slab(all barrowed)	M^3	2.53	2.52	-	2.53	-	-	-	2.54	-	-	-	-	-	-	-	-
5	Casting Upper Floor slab(all craned)	M^3	2.60	-	2.60	-	-	2.59	-	-	-	2.61	-	-	-	-	-	-
6	Floor Screeding	M^3	9.87	-	-	10.18	-	10.01	-	-	9.98	-	-	9.62	-	-	9.58	-

7	Wall plastering/Rendering	M^3	9.08	9.32	8.89	-	-	-	-	-	9.11	-	-	8.98	-	-	-	-

Mean Observed Output = Summation of all Observed Outputs per Site

Number of Men Observed

The results of the site observation and measurements are shown in Table 6 and 7. When compared across sites, it was discovered that the mean observed outputs of bricklayers in sites I to XV are higher than that of sites XVI to XXX. In the laying of 150mm sandcrete blocks for example, the mean output of bricklayers in sites I to XV (Table 6) was 68mm while it was 66mm for sites XVI to XXX (Table 7). For the laying of 225mm sandcrete blocks, the mean outputs are 63mm and 62mm for sites I to XV and sites XVI to XXX respectively. The same trend was observed in other activities as contained in the two tables.

The significantly higher level of output achieved in sites I to XV could be attributed to the observed psychological impact of the visible training programmes being operated on these sites (sites I to XV). The training programmes are assumed to have stimulated the performance of bricklayers on these sites and also act as morale boosting for them at the same time. The result corroborated Zhou (2004)'s findings that motivation, when it is combined with work experience and education, is an important factor in improving performance. It also lends credence to Jergeas (2009), Hewage (2007) and Fagbenle, et.al (2004)'s studies on productivity/motivation of construction operatives.

4.0 CONCLUSION

The study had highlighted the importance of training in the productivity improvement of bricklayers in Nigeria. The study concluded that vocational training avenue is a preferred method of training bricklayers in the area. It also reiterated that on-the-job training programme is the most preferred training programme for the bricklayers. However, in-service training programme was most preferred by the management of large sized construction firms because these firms can afford to retain quality staff for a long time and also send them for further skill acquisition training programmes from time to time. The study also asserted that training programmes have brought about an increase in the productive time of bricklayers and consequently enhances their productivity.

As a result of the foregoing, it is considered that the following need to be addressed for the Nigerian construction industry to move forward.

There is a clear need for improvement in the area of training and retraining of construction operatives, notwithstanding the one-off nature and the nomadic behavioural pattern of the

industry. This will go a long way in the productivity improvement of individuals on sites and the construction industry as a whole.

To encourage a speedy growth in the productivity of the construction industry, government must create enabling environment for the management of the three categories of construction firms in Nigeria, especially in the area of training and retraining of their employees.

Realizing the fact that training/retraining is not the only factor that has positive contribution on productivity, equal attention should be paid to other factors such as monetary and non-monetary incentives, organizational procedures and planning, scheduling, control and supervision of workers as well as general management. With this, it is expected that construction productivity improvement would be taken to the highest esteem.

Though this research had studied the effect of training on the productivity of bricklayers in Nigeria, research efforts on other categories of craftsmen in other nations of Africa /World is also advocated. This is to act as a basis for comparison in the final analysis.

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