

The Effects of Training on the Productivity of Construction Craftsmen in South Western Nigeria

S OLATUNJI and K AJIBOLA
Oyo State Housing Corporation
P.M.B. 5214, Bodija, Ibadan, Nigeria

A COKER
Department of Civil Engineering,
University of Ibadan, Ibadan, Nigeria
cokerwale @ hotmail.com

Abstract

Investigation was carried out on the effects of both formal and informal training on the productivity of construction craftsmen in Southwestern Nigeria. The study employed the use of questionnaires and personal interviews conducted on both the management staff and the construction operatives who were randomly drawn from large, medium and small-sized construction firms located within the study area. The results show that training had significant effects on the productivity of construction craftsmen. Other factors such as granting of financial and non-financial incentives, general organisation, planning control and supervision of workers also had their effects on productivity. The study proved that a number of benefits are accruable from application of improved formal and informal training programmes for construction craftsmen in southwestern Nigeria. Little wonder then that the management of the three categories of firms studied attached greatest priority to on-the-job training followed by practical demonstration as well as ensuring that vital construction materials are provided as and when due on site.

Keywords: *Construction, Craftsmen, Effects, Nigeria, Productivity, and Training.*

INTRODUCTION

The construction industry stands out as the most conspicuous contributor to capital formation in Nigeria. (Aboyade, 1966). In the pre-independence decade it accounted for about 40% of the total capital formation and in the immediate post independence decade its contribution was a little above 50% (Umo, 1984). It is therefore no exaggeration to assert that the development of the construction industry is the base for all industrial activities in the country. Since economic progress depends upon the investment of the capital for future production, the rate of construction activity has a significant effect upon the economic health of a nation and its future growth. This implies that when the economy booms the construction industry also flourishes. The reverse is also true. Even in period of economic depression, people still build. Government, the largest client, still invests in capital projects as a way of revamping the depressed economy. The largest share of investment capital in all developing countries finds its way into construction. Unfortunately, the Nigerian construction industry is least developed in terms of mechanization, productivity and the benefits derived from industrial progress.

Research was thus conducted to identify the effects of formal and informal training on productivity of construction craftsmen in Southwestern Nigeria taking into cognisance the contents of such training in terms of duration, quality and relevance.

Productivity

All over the world and most especially in the developing countries, the construction industry is characterised by: repeated delays and cost overruns. In Nigeria, the industry has been bedevilled by a myriad of problems ranging from prohibitive cost of construction to wide discrepancies between planned and actual construction duration, sometimes leading to outright abandonment of the project (Mbachu, 1998). The prevailing harsh economic climate in the country has made productivity to be at low ebb. However, there are other factors that have hampered the productive capacity of labour in Nigeria's construction industry. Some of these factors are the workers' technical and attitudinal skill coupled with the educational background and the management and technology available for the industry (Olomolaiye, 1987). Coker and Agbede (2000) found out that labour without appropriate equipment has limitation as per scope and completion time of projects.

Wahab (1977) was of the view that the factors affecting the productivity in Nigeria's construction industry are many and varied, namely shortage of building materials, poor method of construction, inclement weather during construction works, absenteeism on a prolonged scale and lastly failure of contractors to recognise the importance of plant, tools and worker training as means of increasing their productivity.

The term "productivity" itself has various connotations. In one context it may mean the substantive analysis of the technology and operating system of a factory. In another it might mean the subtle motivational aspects of the management of the efforts of a white-collar workforce. In yet another the emphasis might be on long-range improvement in financial results through inventory control. Eze (1981) defined productivity as a measure of how well resources are brought together in organisations and utilised for accomplishing a set of results.

Olomolaiye (1990) used the widely known efficiency equation as a measure of productivity:

$$\text{Efficiency} = \frac{\text{Output}}{\text{Input}} \quad (1)$$

Output in this study on bricklayer motivation, refers to the number of bricks laid and input is the time spent by the bricklayers to lay the bricks. Contributing, Nwachukwu (1988) defined productivity as a combination of effectiveness and efficiency. That is:

$$\text{Productivity} = \frac{\text{Performance Achieved}}{\text{Resources Consumed}} = \frac{\text{Effectiveness}}{\text{Efficiency}} \quad (2)$$

It is clear from the foregoing definitions and observations that there is an increasing demand for a more efficient construction industry to underpin infrastructure development in Nigeria's growing economy. More than ever, there is an urgent need to confront headlong the problems militating against productivity in the nation's construction industry.

Education and training

Education has been defined as those activities, which aim at developing the knowledge, moral value and the understanding required in all walks of life. Furthermore education has been defined as the systematic instruction in the development of character and mental powers in various disciplines. Education has no doubt become the greatest industry in any nation. In Nigeria, it has continued to play a unique role in economic development and social transformation process. Since construction operatives are always on the move, there is the need for them to be thoroughly educated. Craftsmen receive their education in the form of formal training in vocational schools and technical colleges, attendance at workshop complemented with field activities.

Training on its own part is the process of bringing a person to a deserved state of efficiency by instruction and practice. Training has been defined as the systematic development of the attitude, knowledge and skill behaviour pattern required by an individual in order to perform adequately a given task or job. Putting it differently, it is 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 organisation.

RESEARCH METHODOLOGY

The research methodology consists of questionnaire survey to collect primary data and direct field measurements and observations. Construction practitioners designed the questionnaire survey to identify the formal and informal training opportunities applicable to craftsmen, assess the contents, duration and relevance of such training to the Nigerian construction industry and also to determine the premiums placed on each of them. The survey was also meant to investigate the effects of the training on operatives within the study area.

Secondary data were obtained by measuring productivity level attained before and after training were put in place. The study population included the construction practitioners in Lagos, Oyo, Ogun, Osun, Ondo, Ekiti and Edo states in southwestern part of Nigeria. The sampled population cut across the three categories of practitioners in the area namely construction firms that are large sized, medium-sized and small-sized as registered with the Nigeria's Federal Ministry of Works and Housing.

RESULTS AND DISCUSSIONS

Table1 shows the responses of the management in large, medium and small sized firms respectively while Table2 gives the relative index of the responses in the three categories. The relative qualification (RQ_i) index was determined using the following formula:

$$\text{Relative Qualification Index} = \frac{\text{Attained Summation of } P_i U_i}{\text{Attained Summation}} \quad (3)$$

$$= \frac{\sum_{i=1}^n P_i U_i}{n \times (4+3+2+1+0)} \quad (4)$$

where

- P = Subjective importance of the variable
- U = Number of respondents
- n = Number of relevant qualifications

Table 1: Identification and assessment of formal training undertaken by craftsmen

S/N	Educational And Professional Qualifications	Large Sized Firms	Medium Sized Firms	Small Sized Firms
		4 3 2 1 0	4 3 2 1 0	4 3 2 1 0
1.	No formal Education - apprenticeship only	0 0 0 0 26	0 0 0 0 16	0 0 0 16 7
2.	Primary School plus apprenticeship.	0 0 0 26 0	0 0 0 16 0	0 0 11 12 0
3.	Modern School Certification plus apprenticeship.			
4.	Sec. School Certificate plus apprenticeship	0 0 26 0 0	0 12 4 0 0	0 12 11 0 0
5.	Formal Education plus Trade certificate	2 23 1 0 0	8 8 0 0 0	4 19 0 0 0
6.	Trade Certificate plus City and Guilds.	23 3 0 0 0	12 3 1 0 0	13 10 0 0 0

Extent of premium: 4 = very highly preferred 3 = highly preferred 2 = averagely preferred
1 = rarely preferred 0 = preferred

Source: Field Survey 1999.

Table 2: Relative index of premium placed on the formal training undertaken by operatives.

S/N	Educational and Professional Qualifications	Large Sized Firms	Medium Sized Firms	Small Sized Firms	All Firms
1.	No formal Education - apprenticeship only.	0.00	0.00	0.27	0.09
2.	Primary Sch. Plus Apprenticeship	0.43	0.27	0.57	0.42
3.	Modern Sch. Cert. plus apprenticeship	0.53	0.53	0.72	0.59
4.	Sec. Sch. Cert. plus apprenticeship	0.87	0.73	0.97	0.86
5.	Formal Educ. plus Trade Certificate	1.28	0.93	1.22	1.14
6.	Trade Cert. plus City & Guild	1.68.	0.97	1.37	1.34

Source: Field Survey, 1999.

The results in Table 2 show that the City and Guilds of London Certificate are highly preferred in all the three categories of construction firms. The next in ranking is the Technical College Certificate plus the Government Trade Test Certificate. The table also show that operatives without formal educational qualifications are gradually no more required in the profession. The high premium placed on the City and Guilds of London Certificates during interview might not be unconnected with the fact that most of the chief executives of small sized firms are holders of the certificate. Wahab's (1977) assertion of low education as one of the factors responsible for low productivity in the Nigerian construction industry might be based on the good quality of the course contents embedded in the City and Guilds syllabus as compared with NBTE (National Board for Technical Education) syllabus.

Table 3 presents the craftsmen's training and educational backgrounds. Forty-two percent were trained through the technical colleges, an indication that there has been an increased awareness by the youths in technical education. However, a sum total of the operatives that passed through the apprenticeship schemes surpass those trained through the technical college. From the interview conducted on sites, it was discovered that working gangs consisted of relatives or neighbours from the same locality. Craftsmanship is acknowledged to be maintained through one generation passing skills on to the next. This is an indication that the scheme is still widely accepted by the Nigeria populace. This buttresses the assertion that was clearly recognised by Wahab (1977) on how best to mass-produce labour in the construction industry.

Table 3: Types of training/Educational background of craftsmen under study.

S/N	Educational & professional qualification	Number & Percentage of Craftsmen		Total
		Bricklayers	Carpenters	
1.	No formal Education-apprenticeship	5	0	5
		12%	0%	7%
2.	Primary School plus apprenticeship	9	2	11
		21%	7%	16%
3.	Modern Sch. Cert. plus apprenticeship	0	4	4
		0%	15%	6%
4.	Secondary Sch. Cert. plus apprenticeship	4	7	11
		10%	26%	16%
5.	Formal Education plus trade cert.	16	13	29
		38%	48%	42%
6.	Trade Cert. plus City & Guilds	8	1	9
		19%	4%	13%

Source: Field Survey, 1998

From the results in Table 4, it is clear that on-the-job training is employed to a considerable extent. The relative index of 0.98 for all the firms under management rating placed it above all other forms of training applicable to the construction industry. The reason might not be unconnected with the fact that operatives during the course of training are equally productive. Practical demonstrations with relative index 0.92 come second. This may be due to the fact that most of the construction materials manufacturers have nowadays cultivated the practice of introducing new products to the industry through practical demonstration.

The least preferred mode of training is further Education with 0.32. The existence of a construction firm depends on award and winning of contracts. In addition, contracts are always executed within a time limit. These factors do not favour the retention of permanent workers, which in turn discourage the idea of sending operatives for training that will take a considerable length of time and money.

Table 4: Index of premium placed on further training programmes beneficial to the construction industry.

S/N	Types of Training	Large Sized Firms	Medium Sized Firms	Small Sized Firms	All Firms
1.	Induction training	1.00	0.63	0.95	0.86
2.	On the job training	1.13	0.72	1.08	0.98
3.	Refresher training	0.80	0.42	0.65	0.62
4.	Skill Upgrading	0.65	0.35	0.50	0.50
5.	Practical Demonstration	1.07	0.70	0.98	0.92
6.	Further Education (in service training)	0.38	0.28	0.30	0.32

Source: Field Survey, 1999.

Having been convinced that the various types of training enumerated earlier on are necessary, the questionnaire sought to find out the reasons behind the introduction of the variables considered. The responses of the management concerning the premiums placed on each of the reasons highlighted as well as the premium index are presented in table 5.

Table 5: Relative index of premium placed on the reasons for the introduction of further training.

S/N	Possible Reasons	Large Sized Firms	Medium Sized Firms	Small Sized Firms	All Firms
1.	The Workers are not meeting the target output.	0.69	0.49	0.71	0.63
2.	Frequent breakdown of construction tools and machineries.	0.61	0.51	0.58	0.57
3.	Decrease in quality of production.	0.44	0.30	0.56	0.43
4.	Frequency in repetitive works and wastages of vital construction materials.	0.91	0.57	0.86	0.78
5.	Evidence of frequent reports of avoidable accidents on sites.	0.59	0.47	0.56	0.54
6.	The time set for completion of projects are not met.	0.80	0.50	0.77	0.69
7.	Evidence of deficiencies in work operation due to advancement in technology-introduction new materials.	0.76	0.44	0.44	0.55
8.	When workers are due for advancement in position.	0.36	0.30	0.29	0.32

Source: Field Survey, 1999.

The results indicate that the major reason is when the management notices the frequency in repetitive works and wastages of vital construction materials. Management has the last say in this regard. Second in ranking was when management discovered that the times set for completion of projects are not met. Third in the ranking is when there is evidence that workers are not meeting the targeted output set for them in each operation.

The questionnaire sought to find out from the management of the three categories of firms whether the training introduced had been of any effect on the operative and the productivity at the construction sites. Seven statements were listed in the questionnaire and management were asked to indicate in ranking order how each of the seven statements fared.

The results in Table 6 show that the wastage of construction materials (relative index 0.87) usually experienced before have been minimised. The relative index of 0.85 gives the reduction in the frequency of breakdown of construction equipments, tools and machines the second position while serious reduction in the completion time of projects due to unprecedented increase in workers output came third. Relative index of 0.72 placed increase in mental capacity of operatives in handling complex projects in the fourth position and reduction in industrial unrest came fifth.

The study reported in this paper had highlighted a number of benefits apart from increased productivity accruable to Nigeria's construction industry through the application of improved formal and informal training programmes. Moreover, other factors such as financial and non-financial incentives, general organisation and procedure, planning, control and supervision of workers had positive effects on productivity.

It is, however, recommended that the management of the three cadres of construction firms studied should attach utmost importance to material schedule and scheduling, provision of adequate working tools and equipments, regular payment of wages to their operatives in order to stimulate their productivity.

Table 6: Relative index of the effects of training on the productivity of construction sites.

S/N		Large Sized Firms	Medium Sized Firms	Small Sized Firms	All Sized Firms
1.	Minimised wastages of construction materials.	1.06	0.64	0.91	0.87
2.	Reduced frequency of breakdown of construction equipment, tools and machines.	0.99	0.64	0.94	0.85
3.	Reduced completion time of project due to increase in workers output.	0.89	0.63	0.83	0.78
4.	Reduced repetitive works.	0.80	0.56	0.74	0.70
5.	Increased the mental capacity of operatives in handling complex projects.	0.93	0.57	0.67	0.72
6.	Reduced industrial unrest.	0.81	0.50	0.64	0.65
7.	Minimised cases of accidents on sites.	0.76	0.53	0.74	0.68

Source: Field Survey, 1999

CONCLUSION AND RECOMMENDATIONS

The study reported in this paper highlighted a number of benefits apart from increased productivity accruable to Nigeria's construction industry through the application of improved formal and informal training programmes. Moreover, other factors such as financial and non-financial incentives, general organisation and procedure, planning, control and supervision of workers had positive effects on productivity.

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