
**TRAINING OF CONTRACTORS CRAFTSMEN FOR PRODUCTIVITY IMPROVEMENT
IN THE NIGERIAN CONSTRUCTION INDUSTRY**

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ABSTRACT

Most construction projects in Nigeria fail due to poor contractors' performance. Firms are concentrating on financial gains and forgetting the people that make the job and money. The problem of the industry is how to reconcile the need for a supply of manpower capable of high productivity in carrying out simplified sequential operations and retains a substantial number of craftsmen capable of highly skilled work. The study aimed at investigating the level and the hindrances to training, and to identify the best training types/methods that will optimize the productivity of construction craftsmen in the Nigerian Construction Industry. The study uses descriptive survey method; two sets of questionnaires were randomly distributed in four north-central states of Nigeria and Abuja to construction professionals and craftsmen. Percentages, severity and importance index were used for the analysis. The chi-square statistics used at 5% level of significance to test the research proposition formulated for the study shows an agreement within the respondent. The study revealed that: level of training among the four trades is very low, with an average training level of 37.21% and an average untrained level among the trades being very high at 62.79%. The older age groups had more training experience than the younger groups. Lack of standard type/method of training adopted for the Nigerian construction craftsmen and lack of encouragement and support for construction craftsmen are the most severe hindrances to training. Vestibule Schools and time release training are the most efficient types/method of training. The study recommend that construction craftsmen should be encouraged and supported for training and as well, vestibule schools and time release training methods should be adopted for training craftsmen in the Nigerian construction industry.

Keywords: *Contractors' craftsmen; training; productivity; Nigerian construction industry.*

INTRODUCTION

In realizing its aim in project delivery, the construction industry involves many parties amongst which are: the owner or client; the designers or consultants and; the construction contractors (Gollenbeck, 2008). The contractor, is undeniably one of the most important organisations in the construction project delivery system (Idoro and Akande-Subar, 2008). Generally (Gollenbeck, 2008), the contractor is in charge of the assembly of a number of different materials and components as well as of the integration of various systems and suppliers. He further stated that the contractor is referred to as a system assembler. In attaining his roles the contractor coordinate and direct his craftsmen (operatives) which according to Dantong (2007) constitute the main workforce of the contractor. The Industrial Training Fund of Nigeria (ITF) (2005) enumerated the following as Craftsmen: Bricklayers (Masons); Steel fixers; Electricians; Carpenters; Painters; Plumbers; Artisans; etc. Construction craftsmen are construction operatives who contribute skillfully with their hands in the practical realization of a project in the

construction industry (Dantong, 2007). The construction industry occupies a sensitive position, as it plays a prominent role in the economy of any nation (Achuenu, *et al.*, 2000). The industry's role is very essential because its end products are the infrastructural facilities required for transportation, housing, communications, water and power supply, manufacturing and waste disposals (Achuenu, *et al.*, 2000). The importance of the construction industry can never be over emphasized; in Nigeria, the industry is responsible for 16.00% of the GDP (Ayangade, *et al.*, 2009) and employs approximately 25% of Nigeria's workforce and the largest in Africa (Ibrahim and Musa-Haddary,2010). According to Obiegbu (2003) the level of building achievement and activity in any country is a measure of the country's success: a high level of building activity indicates a healthy vigorous national economy; and highly developed building forms indicate a high level of civilized and cultural achievement in a country.

However, most construction projects in Nigeria fail due to poor contractors' performance which is characterized by (Balogun, 2005): poor workmanship; rework; low productivity; late completion; cost overruns; high accident rate; poor work practice and; conflicts. Wahab (2005) identified qualitative and quantitative deficiencies in workmanship as some of the factors militating against the attainment of success in the Nigerian construction industry. Furthermore, firms are concentrating on financial gains and forgetting the people that make the job and money (Omole, 2001). The problem of the industry according to Dantong (2007) is how to reconcile the need for a supply of manpower capable of high productivity in carrying out simplified sequential operations and retains a substantial number of craftsmen capable of highly skilled work. Embarking on the training of contractors' craftsmen will go a long way in curtailing these problems in project delivery in Nigeria. The aim of the study is to investigate the level and the hindrances to training, and to identify the best training types/methods that will optimize the productivity of construction craftsmen in the Nigerian Construction Industry.

THE NEED FOR TRAINING CONTRACTORS CRAFTSMEN

Nmadu (1998) defines training as an organizational effort to change the behaviour or attitudes of employees so that they can perform to acceptable standards on the job. Training seeks to achieve improved human productivity by increasing the ability level of the work force (Taylor, 1961). Training according to Nmadu (1998), seeks to meet the demands on growth and change. Training is giving teaching and practice to a person or persons in order to bring him or her to a desired standard of behaviour, efficiency or physical condition (Obiegbu, 2003). In addition (Obiegbu, 2003), training is submitting a person to discipline and instruction, to educate, to bring up, rear in habits of good behaviour and conduct". The nature of the human resource problem and its pervasive effects indicate the need for extraordinary action to upgrade managerial and technical skills, broaden their range and increase their totality. Education and training are, consequently, needed at all levels and across a wider spectrum of technical discipline. Indeed, what is required more than ever before is a highly trained cadre of people who are alive to the needs and realities of their own societies, sensitive to cultural values of intrinsic worth, conscious of the social nature of design and imbued with philosophy, which leads to the efficient use of indigenous materials and techniques (Bokinini, 2005).

Davis et al. (2007) observed that construction participants, contractors inclusive are face with challenges which amongst others includes: higher clients' requirements through increasing complexity of modern construction projects; impact of computerization and; competition within the industry. In addition, the quest for efficiency and drive for competitiveness are cardinal goals of globalise economy (Oyediran, 2006). Disciplines and Professionals that are able to deliver these goals are certainly the toast of the society and will enjoy full endorsement and patronage (Oyediran, 2006). The industry has a responsibility to its customers to be an enlightened and progressive employer; the needs of the workforce are inextricably linked with the requirements of its consumers and need must be paid to each. History has shown that the effort of an ill-prepared and disenchanting workforce has failed to produce good service, and as a result, the industry is burdened with a poor image. In view of these the expectation of every employer is the evolution of a competent, capable, highly motivated work force whose hallmark would be the attainment of organizational goals (Dantong, 2007). Training offers the platform for enhancing the potentials of the contractors craftsmen through the improvement on their skills and consequently contributes to contractors performance in the construction industry.

THE EFFECTS OF TRAINING ON PRODUCTIVITY IMPROVEMENT

Productivity improvement is a central challenge for managers in all types and sizes of organizations. Managers are being asked to get more mileage out of all their resources: human, financial, information, and materials. Productivity is any output – input ratio. Inputs include all resources consumed to produce those outputs. Labour is one of the input resources consumed but so too are capital, material and energy (Abiola, 2004). Productivity is reaching the highest level of performance with the least of expenditure of resources. Productivity, ultimately, is the ability to produce in the desire to produce. Training offers the craftsmen the ability to perform their work effectively and efficiently and these qualities are recipe for workers productivity. Therefore construction craftsmen when employed must be trained to the industries standards while those already employed must be constantly trained and retrained in order to improve on their productivity.

TYPES/METHODS OF TRAINING

Apprentices or other workers can have benefit of either day release, which means attendance on a day a week at a local technical collage or commercial institute, or block release, which means attendance over several weeks at a time. Types/Methods of training are:

Trade Group Training Programmes

When the groups of several or many employees are added to the site force at the same time, considerable economy can be achieved by carrying out a large part of the training in formal classes. Such a produce has the aforementioned advantages on interviews and conferences and makes possible that utilization of various form of group training methods. Tools use in the training includes: lectures; charts and graphs; group demonstrations; manuals and handbooks; motion picture films; sound slides; written assignment and examinations; analysis of case studies; and group dynamics or role playing (Dantong, 2007).

Crafts Apprenticeship Courses

Apprenticeship is described as training for occupations in the category of skilled craft. Programmes consist of on – the job training and work experience with related instruction in the theoretical aspects of the apprentice on the job, which improve steadily during the period of a well – programmed training (Dantong, 2007).

On – The – Job Training

Generally in on – the – job training, the following conditions should be met (ITF, 2005):

- The training takes place in the environment in which the trainee will work at the end of his training;
- The trainee work with equipment and materials which he will use at the completion of training; and
- The job procedures are the same as obtained after training.

Development of basic skills and advanced knowledge and skills will be developed at the company level through independent practical assignment under instruction supervision of instructor/company apprentice supervisor (ITF, 2000; Nmadu, 1998). It is widely used because most jobs in industries can be learned in relatively short time and no elaborate programme is necessary as far as subject content is concerned (Nmadu, 1998).

Sink – Or – Swim Method

This method of training allows employers (contractors) to place a new and inexperienced employee on a site to work, and let him pick up the information that he needs informally as best he can, merely by watching and listening to others who are performing the work he is expected to do (Datong, 2007). This method according to Dantong (2007) is the least efficient, most wasteful, and in the long run, most expensive alternative.

Sponsor System

In this method, the **sponsor** who is an experienced and capable craftsman is charged with the responsibility of introducing the apprentice (employee) to the job and instructing him in the details and technicalities of his work. Sponsors ordinarily work with new employees for one or two weeks. Sponsors should be carefully selected on the basis of their patience, tact, ability to get along well with others, and conformance to building system and policies not simply on the basis of the sponsor's building abilities (skill) (Dantong, 2007).

Time Release Training

This type of training is applicable to situations where apprentices who had earlier received basic training now requires to attend training sessions in a centre for a few hours or one day in weeks to advance and/or update their knowledge and skills (ITF, 1999; Peterson and Tracy, 1979).

Self – Teaching Approaches

Substantial progress has been made in the use of programmed institution for the teaching of building procedures and systems. Programmed instruction is a self – instructional method by which information is systematically presented to an individual who learns independently of others, instruction is broken up into small increments, which are

developed so that each new increment adds to the proceeding one. The trainee proceeds at his own pace, participating by active response to workbooks, audiotapes, filmed materials, or other devices (Peterson and Tracy, 1979).

Vestibule Schools

A Vestibule School is one operated as a specialized endeavour to train for the same type of job as on the job training. The Vestibule School is identical to the work situation, after training, trainee is handed back to this supervisor (Nmadu, 1998).

Apprenticeship Programmes.

This tends toward more education on the job training and knowledge and skill in doing craft or series of related jobs involved. Such apprenticeship programmes must be registered with appropriate government authorities. These programmes last anywhere from two to five years and are available in crafts like mechanics, electricians, pipe fitters, carpenters etc (Nmadu, 1998).

Special Courses

Peterson and Tracy (1979) advocate the following methods of special course training:

Written Material: Written materials come in many forms example; textbooks and course of instruction, including correspondence course and programmed materials; instruction booklets and manuals; even simple memoranda, notices and signs. They are particularly useful for knowledge training, but can also be used in conjunction with practice for skill training (Peterson and Tracy, 1979).

Lecture method: According to Peterson and Tracy (1979), lectures, like written materials, are a form of one-way communication. Lectures have the advantage of being more personal than written communication, but they are slower though. Lecture is an economical and efficient method of imparting large amounts of standardized information to a relatively homogeneous audience.

Conference method: The conference or discussion group has several uses. When it involves a group of equals, it is primarily a means of sharing and developing ideas, rather than a training device. However, the conference can be transformed in to a tool for disseminating information, simply by bringing a group of trainees together with a trainer discussion leader (Peterson and Tracy, 1979).

Business games

Another method for teaching decision-making is the business game. Games are built on models that purport to represent the complex interactions of economics and other factors in business. The models are formed into equations of tables that are used by the instructor to evaluate the effects of student decisions. The computational task is often performed by computers that have been programmed with the equations.

Role playing

Role-playing is another type of training based on the simulation reality. Trainees are asked to put themselves in the position of a particular individual and act out a case situation.

Such role situation can be used to develop empathy for the individual whose role is being played. It can also be to develop understanding of nature roles. As with case study, role-playing may serve to develop problem – solving or interpersonal skills (Peterson and Tracy, 1979).

Job Rotation

Job rotation is a technique whereby the trainee is moved through several jobs in rapid succession. Tenure on one job may last a few days, weeks, or months, depending on the nature of the job and how much there is to learn. Unlike role playing, job rotation requires the trainee to perform real work. The realism of the technique is limited, however, because the trainee knows his or tenure will be brief (Peterson and Tracy, 1979).

Apprenticeship and Coaching

Apprenticeship and coaching are traditional methods of skill training. They are similar in using one-to-one relationship between trainer and trainee. Under apprenticeship plan, the training is conducted primarily by example. The apprentice observes and tries to copy the master, who then evaluates and criticises the apprentice's effort (Osei, 2000).

Sensitivity Training

According to Osei (2000) sensitivity training also known as T-grouping is a technique directed towards attitude change and development of interpersonal skills and self awareness. Sensitivity training attempts to make trainees more willing and able to communicate their feelings and receive the feelings of others. The basic mechanism of doing this is an agenda-less conference in which the trainees gradually discover that the topic for discussion is their own behaviour and communication process. In addition to developing an attitude of greater openness in communications, sensitivity training attempts to develop self-awareness and the ability to understand and accept differences in people.

Transactional Analysis

Transactional Analysis (TA) is a group training technique directed at the development of improved communications, interpersonal skills, and self-awareness. Although Transactional analysis was originally developed as a technique of group therapy for mental illness, in recent years it has seen increasing application to every day life. Transactional analysis has been applied to business and there are many consultants offering transactional analysis training (Osei 2000).

Action Research

Osei (2000) reported that, although Action Research is not usually considered a method of training, the action research technique is used to change attitudes and develop problem solving skills. The method consists of gathering data about a problem and feeding it back to a group of employees who are involved in or affected by the problem. The employees discuss the problem, arrive at a solution and in the process become committed to the action to implement the solution.

Developmental training

This method assumes that every job can be done better, that there is always something more an employee can learn about a job, and in many cases that certain worker wish to prepare for advancement to better positions. Continuous on-the-job training is recognized as an integral part of developmental training (Dantong, 2007). Many of the techniques listed above involve trial-and-error process. Thus a good training technique almost invariably involves some sort of feedback mechanism that permits assessment of performance and correction of errors.

METHODOLOGY

The study uses descriptive survey method. Oral interviews were conducted on members of the sample groups (professionals and craftsmen) and existing literatures were reviewed in obtaining data on the subject. Two sets of structured questionnaires for data collation were administered to construction professionals: Architects, Quantity Surveyors, Builders and Civil Engineers and; contractors' craftsmen: Bricklayers, steel fixers, carpenters and, electricians. The questionnaires were distributed randomly in four stratified sample locations in the north-central States of Nigeria (Kaduna, Nasarawa, Niger and Plateau) and Abuja-the capital city of Nigeria. The response rates for craftsmen and professionals were 55.25% and 51.40% respectively (see table 1 and 2). These indicate an unbiased and higher value of survey as stipulated by Iro (2006). The data collected were analyzed to determine percentages of trained and untrained craftsmen base on trades and age group and the results were presented on a bar chart. The data from the professionals were analyzed using Kendall's coefficient of concordance to establish the level of severity and importance of sample factors and rank them according to their severity and importance index. The chi-square statistics used at 5% level of significance to test the research proposition formulated for the study shows an agreement within the respondent.

DATA PRESENTATION AND ANALYSIS

Table 1: Distribution and Response Rates of Questionnaire for Craftsmen

S/No	STATE	NUMBER DISTRIBUTED	NUMBER RESPONSES	OF PERCENTAGE OF RESPONSES
1	FCT	100	60	60
2	KADUNA	80	30	37.5
3	NIGER	50	15	30
4	NASARAWA	70	40	57.14
5	PLATEAU	100	76	76
TOTAL		400	221	55.25

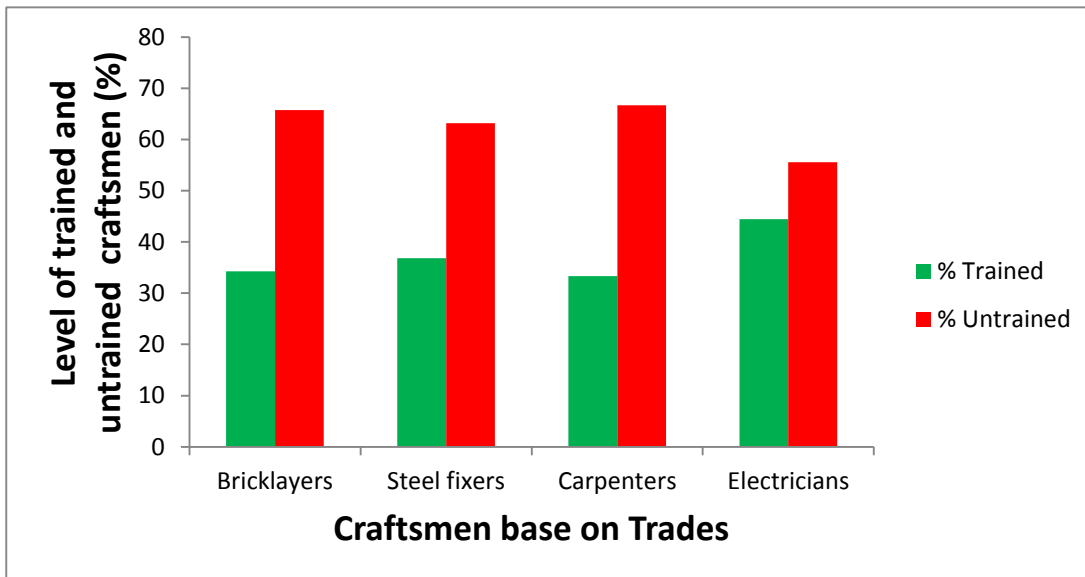


Figure 1: Level of trained and untrained craftsmen base on Trades
Source: Field survey (2011)

From figure 1, the level of training among the trades ranges from 34.27%, 36.80%, 33.33%, 44.44%, and the level of untrained craftsmen are 65.73%, 63.20%, 66.67% and 55.56% for Bricklayers, Steel fixers, Carpenters and, Electricians respectively. With Electricians having 44.44% the highest level of training and Carpenters having 33.33% the least level of training. The level of untrained craftsmen is very high with an average of 62.79%.

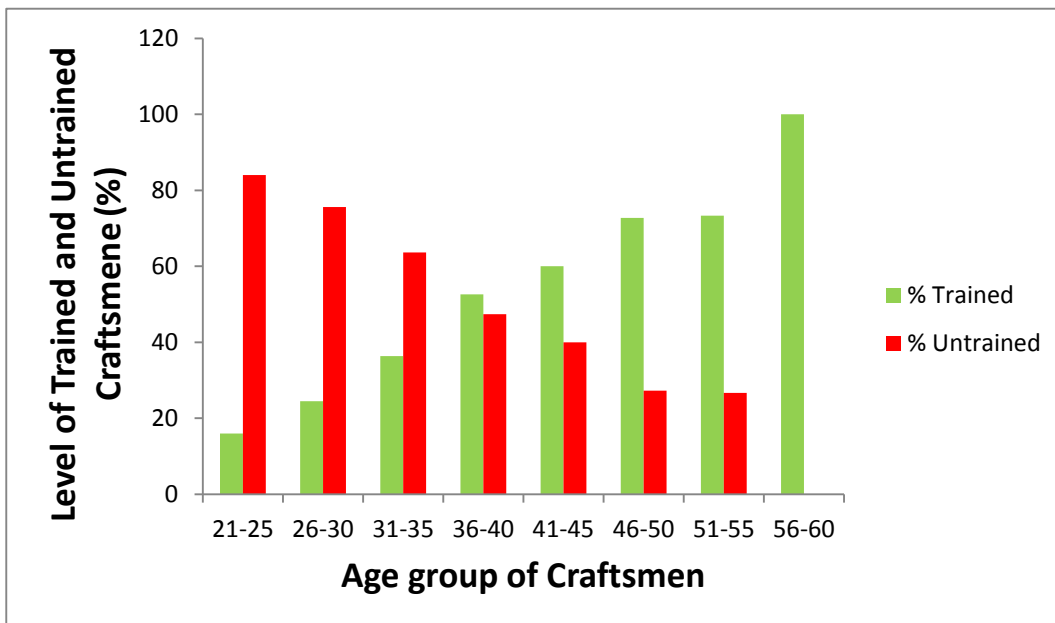


Figure 2: Level of trained and untrained craftsmen base on age group
Source: Field survey (2011)

From figure 2 above, the training trend shows that the older groups are more trained than the younger groups. The highest trained age group is the range of 56 – 60 with 100% of

the respondents trained. The least trained is the age group range of 21-25 with a percentage training of 16%. This may mean that the training programmes of the construction craftsmen are facing out with age. It can be perceived from the above that training may cease to exist in the industry if adequate steps are not taken to solve the problems.

Table 3: Distribution and Response of Questionnaires for Construction Professionals

S/NO	LOCATION STATES	NO. DISTRIBUTED	NO. RESPONDED	% RESPONSE
1.	Abuja-FCT	80	58	72.5
2.	KADUNA	40	6	15
3.	NIGER	60	38	63.3
4.	NASSARAWA	40	16	40
5.	PLATEAU	60	36	60
TOTAL	5 STATES	280	154	51.4

Source: Field survey (2011)

Table 3: Construction Professionals Combine rank agreement on the severity of hindrances to craftsmen training

S/N	Types/ training (Factors)	Method's of	Rank scale					Rank Sum (Rs)	Rank Index R.I = $\frac{RS}{SN}$	Rank order (R.O)
			5	4	3	2	1			
1.	Lack of standard type/method adopted for construction craftsmen		30	13	7	5	-	223	0.83	1
2.	Poverty / lack of fund		20	10	15	7	4	203	0.73	4
3.	Government negligence to training of construction craft men		24	17	9	-	6	221	0.79	3
4.	Lack of encouragement & support for construction craftsmen training		27	14	10	4	1	224	0.80	2

Field survey (2011)

The combine Rank Agreement factor (R.A.F) on table 3 above, shows the severe factor to be: lack of standard type/method of training adopted for the Nigerian construction craftsmen rank 1st, lack of encouragement and support for construction craftsmen rank 2nd. The least severe factor was poverty/lack of funds which rank 4th.

Table 4: Combine Rank Agreement of Professionals on most efficient Training Type/Method for Craftsmen

SN	Types/ Method's of training (Factors)	Architects' Rank order	Quantity Surveyors' Rank order	Civil Engineers Rank order	Builders' Rank order	Sum of Rank orders	RAF= $\frac{\text{Sum of Rank orders}}{\text{Number of factors}}$	$\text{PRAF} = \frac{\text{RAF}_{\text{max}} - \text{RAF}_{\text{considered}}}{100} \times$	Rank order (R.O)
1.	Trade group training	3	6	3	3	15	0.68	80.68	2
2.	Craft Apprenticeship programme	7.5	3.5	2	9	22	1.00	71.59	4
3.	On-the-job training	6	3.5	9	5.5	24	1.09	69.03	6
4.	Self keeping approaches	22	22	1	22	67	3.05	13.03	18
5.	Sponsor system	10.5	11	4	5.5	31	1.41	59.54	8
6.	Time Release training	4	7	5.5	4	20.5	0.93	73.58	3
7.	Action research	21	21	7	21	70	3.18	9.66	20
8.	In-house training	9	8	8	7.5	32.5	1.48	15.91	16
9.	Visibile schools	1	1	10	1	13	0.59	83.24	1
10.	Special courses	5	5	5.5	10	25.5	1.16	67.05	7
11.	Written materials	14	12.5	11	14	51.5	2.34	33.52	11
12.	Lecture method	7.5	12.5	14	15.5	49.5	2.25	36.08	10
13.	Conference method	13	14	12.5	15.5	55	2.50	28.98	13
14.	Business games	18	19	12.5	17	66.5	3.02	14.21	17
15.	Role playing	12	20	15	13	60	2.73	2.44	14
16.	Job rotation	10.5	9	18	11	48.5	2.20	37.50	9
17.	Apprenticeship and coaching	2	2	17	2	23	1.05	70.17	5
18.	Sensitivity training	15	15	16	18	64	2.90	17.61	15
19.	Transactional analysis	16	16	22	19	73	3.32	5.68	21
20.	Sink or swim training	19.5	17	21	20	77.5	3.52	0.00	22
21.	Remedial training	19.5	18	19.5	12	69	3.14	10.80	19
22.	Development training	17	10	19.5	7.5	54	2.45	30.40	12

Field survey (2011)

Table 4 above shows the combine rank agreement of construction professionals on most efficient training type/method. Vestibule Schools rank 1st, Trade group training rank 2nd, Time-release training rank 3rd respectively, while the least efficient type/method of training was sink – or – swim training which ranked 22nd.

CONCLUSION

The level of training among the four trades is found to be very low, with an average training level of 37.21% and an average untrained level among the trades being very high at 62.79%. The older age groups had more training experience than the younger groups. The highest trained age group is 56 – 60, with 100% of the respondents' undergone training. The least trained is the age group range of 21-25 with a percentage training of 16%. These mean that the training programmes of the construction craftsmen is facing out with age. Four factors were identified as hindrances to training of construction craftsmen in Nigeria; lack of standard type/method of training adopted for the Nigerian construction craftsmen as the most severe hindrance followed by lack of encouragement and support for construction craftsmen and, poverty/lack of funds as the least severe. 22 types/methods of training were identified with Vestibule Schools being the most efficient followed by Time-release training, while the least efficient type/method of training was sink – or – swim. It can be perceived from the above that training may cease to exist in the industry if adequate steps are not taken to solve the problems. Construction craftsmen should be encouraged and supported for training and vestibule schools and time release training methods should be adopted for training craftsmen in the Nigerian construction industry.

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