

Re-Training Needs of Building Technology Graduates in Building Construction Industries in Lagos State and Oyo State of Nigeria

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Abstract

This study was designed to identify the re-training needs of building technology graduates in building construction industries in Lagos and Oyo States. Two research questions and 2 hypotheses guided study. A descriptive survey research design was employed for the study. The population of the study was 217 respondents which comprised of 69 heads of building section and 148 chief/senior technologists (builders). A structured questionnaire consisting of 50 items was developed and used for data collection. The reliability coefficient was 0.86 using Pearson product moment correlation statistics. Mean was used to answer the 2 research questions while z-test statistics was used to test the two hypotheses at 0.05 level of significance. The findings revealed that building technology graduates need training and re-training in the area of managerial function and building structures for effective and smooth career improvement. The hypotheses tested revealed that there was no significant difference between the mean responses of heads building section and chief/senior technologists (builders). Based on the findings, it was recommended among others that building construction industry, Nigerian Institute of Building (NIOB) and other related bodies should provide training and re-training programmes for building technology graduates in building construction industries.

Introduction

The effectiveness in the productive venture depends on the skill of individuals who are capable to offer ideas, innovations, inventions and wealth for both employers and employees. In order to gratify productive venture, workers in any organization are to cultivate and preserve their abilities for the accomplishment of set objectives and also fulfill self-actualization. This cannot be accomplished if workers are not adequately trained and re-trained.

Training of workers is a systematic process of altering the behaviour, knowledge and motivation of workers in a direction to increase the effectiveness and organizational goal achievement (Jackson & Schuler, 2003). In order to generate expertise or skill needed to perform a particular task or series of job within industry, training should be a series of learning and continuous exercise solving the intended issues systematically. On the other hand, re-training is a function of observed training needs and the amount of changes which have taken place in the techniques

of production. Re-training of workers involves the renewal or updating of worker's skills, knowledge, attitude, work habits and competencies to enable them perform their assigned responsibilities creditably (Imhabekhai, 2000). Training and re-training of workers include in-service training and formal training; its adoption depends on the need of the organisation.

Workers' re-training needs are most understood in industries where technology changes like that of telecommunications industry, manufacturing industry, construction industry and other related industries. Building construction industry involves planning, designing, erection, management, maintenance and other operations of diverse engineering of building construction projects through professionals, technicians, building crafts and building operatives in accordance with Nigerian Institute of Building (NIOB). The changes such as the use and choice of construction materials, construction resources technique and basic applications of instructions on managerial aspect among others had given the industry a rethink towards smooth delivery of the project and necessitated for training and re-training needs. Re-training building technology graduates are very vital to the productivity of building construction industry considering the technology growths or changes in the industry.

NIOB (2009) stressed that building technology graduates are trained as technologists and builders in building industries for the production, management and maintenance of building structures for the use of man kinds. Effective management of diverse construction resources is a mechanical tool to attain success in building construction industry. Building management in a construction project has to do with resources such as time, equipment, technology, money, manpower and materials. Less attention on the adequate and proper use of resources has been the issues during the formal training or in-service training in order to complete the modern construction project. The experts organize these resources into activities, execute the activities in logical sequences and manage to complete the projects within the stipulated time and budget.

Erection of building in a building project comprises of workers who are competent in the execution of the building substructure and superstructure (Peter, 2002). Building structure is an organized combination of connected parts (elements) which are constructed to perform a require function. It is required to train and re-train building technology graduates for the productions of modern building structures associated with modern building services. Building project deserves to be constructed and managed effectively by the trained personnel so as to deliver and meet the needs of the clients with legal, cost and environmental constraints. Supervision of modern building structures comprises of structural principles, study of construction information, tests among others has not help graduates to be full participating in today's construction project due to school-industry discrepancy.

Training and re-training of building technology graduates in respect to managerial functions is to focus the graduates on effective management of building resources and as regards to building structure functionality and workability in building construction are highly needed. Re-training needs of building technology graduates in the management of the building structure are not only aimed to promote the ability of workers concerned but also to promote the good image of the organization as well as preparing workers for taking up higher responsibilities when vacancy occurs or when there are changes in technology.

Statement of the Problem

The fast pace of technology proves the need for skill upgrading and worker re-training. Changes in technology have made the skills and knowledge of workers less relevant in today's technology. It is on this note that building graduates execute building construction projects by translating drawings, erection of structures without failure through modern technologies with effective management of resources. Yet failure occurred either by natural and artificial factors (Dada, 2002).

In order to avert the errors through the use of modern technologies by the building technology graduates, Marbel and Olomukoro (2012) called for the training and re-training needs that require a vibrant intent of skills and knowledge to be able to execute the construction stages without any failure to the real property. Therefore, there is a need to fill the gap of graduates in building construction inability to perform their professional function through training and retraining programme. The issue which arises for this study is: what are the re-training needs of building technology graduates of universities and polytechnics in building construction industries?

Research Questions

1. What are the re-training needs of building technology graduates in managerial function in building construction industries?
2. What are the re-training needs of building technology graduates in building structures in building construction industries?

Hypotheses

The following hypotheses were formulated to guide this study and tested at .05 level of significance:

H₀₁: There is no significant difference between the mean responses of heads of building section and chief/senior technologists (builders) on re-training needs in managerial function in building construction industries

H₀₂: There is no significant difference between the mean responses of heads of building section and chief/senior technologists (builders) on re-training needs in building structures in building construction industries.

Research Method

The study adopted descriptive survey research design. The study was carried out in Lagos and Oyo States of South-West Zone of Nigeria. The population for the study was made up of heads of building section and chief/senior technologists (builders) in functional and registered construction firms (contracting and consultancy firms). The total population for the study is two hundred and seventeen (217) which consists of sixty-nine (69) heads of building section and one hundred and forty-eight (148) chief/senior technologists (builders). The heads of building section of the industries are expected to be registered builders while the chief/senior technologists (builders) are also expected to be university and polytechnic graduates. Due to relatively small size of the population there was no sampling as the entire population was used for the study.

A structured questionnaire was used as instrument for data collection. The questionnaire was divided into two (2) sections (A-B) with 50 items. Section A = 29 items and Section B = 21 items were structured in four (4)-point rating scale and values assigned to the responses are: highly required = 4, required = 3, moderately required = 2 and not required = 1. The questionnaire was subjected to content validation. The instrument was tested for reliability using test-retest method with twenty-two (22) respondents. Pearson product moment correlation was used to get coefficient (r) for the reliability of the instrument and the result obtained was 0.8. The data collected was analysed using descriptive and inferential statistics with the aid of Statistical Package for Social Science (SPSS) for the study. The items mean values of 2.50 and above were considered as required while items mean values below 2.50 were considered as not required. The two (2) hypotheses were tested using Z - test at .05 level of significance.

Research Question One

What are the re-training needs of building technology graduates in managerial function in building construction industries? Data answering this research question is presented in Table 1.

Table 1: Mean of Responses of Respondents on the Re-training Needs of Building Technology Graduates in Managerial Function in Building Construction Industries

S/N	ITEMS	Mean	Mean	Total Mean	Remarks
1.	Effective management of building resources (4M) e.g. materials, money, manpower and machines	3.78	3.66	3.70	Required
2.	Changes in techniques and automation on the existing skills	2.64	2.60	2.61	Required
3.	Defect analysis on dilapidations, alteration and refurbishment advice and management	2.94	3.07	3.03	Required
4.	Conceptual skills on significant elements in situations such as waste, accidents, pollution, etc	2.86	2.74	2.78	Required
5.	Interpretation of project drawings (auto-card), specification and contract documents	3.28	3.34	3.32	Required

6.	Delivery, placement and materials' handling techniques e.g. requisitions, purchase orders, material call off, plant returns etc	2.91	2.89	2.90	Required
7.	Preparation of or writing report techniques on the builder's documents	2.74	2.69	2.71	Required
8.	Preparation of progress and program chart for effective delivery of day-to-day activities	2.58	2.53	2.55	Required
9.	Assessment of workmanship skills of craftsmen and subcontractors/suppliers techniques.	3.15	3.13	3.14	Required
10.	Understanding of workers' attitude and developing confidence	2.35	2.41	2.39	Not Required
11.	Computer aided design in project planning, scheduling and inspection e.g. gantt charts production, network analyses etc	3.33	3.26	3.28	Required
12.	Maintenances of high standard of statutory regulations, legal, health and safety Compliance	3.10	3.03	3.05	Required
13.	Technical and professional communication ability among building team e.g verbal, electronics, report, e.t.c	2.67	2.64	2.65	Required
14.	Attending seminar, workshop, board meetings and conference for self-development	3.25	3.36	3.33	Required
15.	Building ability/maintainability analysis of production information and project requirements e.g. terms and conditions	2.74	2.68	2.70	Required
16.	Technical and administrative adjustment changes in building construction e.g human resources, integration, inflation e.t.c	2.99	2.95	2.96	Required
17.	Change of schedules of duties and opportunities for better production	2.17	2.19	2.18	Not Required
18.	Design and construction phase management analysis	2.50	2.55	2.53	Required
19.	Adoption of different methods of building project based execution	2.57	2.66	2.63	Required
20.	Provision of Functional site layout and assessment exercise	2.78	2.74	2.75	Required
21.	Project quality management plan and quality control measures practices	2.97	2.99	2.98	Required
22.	Engagement of right calibre of professionals for work execution	3.25	3.24	3.24	Required
23.	Monitoring and controlling of construction stages through corrective measures	2.99	2.82	2.87	Required
24.	Management, supervision and administration of sites procedure e.g. progress and program report, minutes, inventory etc	3.35	3.33	3.34	Required
25.	Commercial management training on valuations, sub-contracting, variations, procurement etc	3.04	2.95	2.98	Required
26.	Feasibility/ Viability Studies for the production of building construction	2.52	2.44	2.47	Not Required
27.	Estimation of operation costs under budget in the production process	2.84	2.76	2.79	Required
28.	Systematic provision of training and re-training of workers at all levels	3.61	3.58	3.59	Required
29.	Practice of accident reduction exercise, safety requirements, health consideration and environmental legislation	3.21	3.37	3.32	Required

The results presented in Table 1 revealed that 26 items had mean scores above the decision point of 2.5 while 3 items fall below the decision point of 2.5. Hence, the interpretation is that the respondents agreed with the re-training needs of building technology graduates in managerial function in building construction industries for the 26 items while items 10, 17 and 26 are not required.

Research Question Two

What are the re-training needs of building technology graduates in building structures in building construction industries? Data answering this research question is presented in Table 2

Table 2: Mean of Responses of Respondents on the Re-training Needs of Building Technology Graduates in Building Structures in Building Construction Industries.

S/N	ITEMS	- X ₁	- X ₂	- X _t	Remarks
1.	Production of building elements (cast-in-situ and precast) and its assembly's techniques	3.06	3.10	3.09	Required
2.	Science in building and structural characteristics of materials concepts on synthetic materials and fibers'	2.93	2.97	2.96	Required
3.	Interpretation of drawings (auto-card) e.g. (architecture, structural, mechanical and electrical drawing)	3.70	3.65	3.67	Required
4.	Building construction process techniques and methodology in building production	3.12	3.10	3.11	Required
5.	Problem solving techniques using building analysis instruments such as smith hammer, soil testing etc	3.54	3.43	3.46	Required
6.	Study of production information e.g. drawings, specification, and schedules, etc	3.29	3.37	3.34	Required
7.	Construction procedures in building and its functional requirements	2.73	2.73	2.73	Required
8.	Methods of processing and formation of elements into building units and components	2.81	2.78	2.79	Required
9.	Structural principles and workability in building construction production and economics	2.64	2.76	2.72	Required
10.	Functionality, stability and behaviour of constructional elements (parts) under load	2.80	2.87	2.85	Required
11.	Mathematical calculation in design e.g. stress, strain, working stress etc	2.48	2.41	2.43	Not Required
12.	Structural framework (column and beam: upper, middle and bottom beam)	2.09	2.14	2.13	Not Required
13.	Soil test and its bearing capacities, crush tests, setting out and dimensional checks concept	2.74	2.87	2.83	Required
14.	Topography and landscaping of the site construction consideration	2.87	2.80	2.82	Required
15.	Design of footing and foundation, Foundation materials and its properties	2.88	2.83	2.85	Required
16.	Functional requirement and behaviour of floor types and its properties	2.73	2.65	2.68	Required
17.	Technical skills in methods, processes, procedure and production of building	3.22	3.22	3.21	Required

18.	Knowledge on climate, weather and geographical factors (when to build and not)	2.70	2.65	2.67	Required
19.	Craftsmen and materials workability methodology	2.77	2.90	2.86	Required
20.	Structural principles and workability of roof designs, properties of roof materials and wind loads/pressure	2.51	2.47	2.48	Not Required
21.	Ethic role of individual in building team before/during the construction process	2.60	2.62	2.61	Required

The results presented in Table 2 shows that out of the 21 items drafted to answer the research question, 18 items have the mean scores above the decision point of 2.5 while the mean scores of 3 items fall below the decision point of 2.5. In line with the decision rule, it means that respondents agreed with the re-training needs of building technology graduates in building structures in building construction industries for the 18 items while 3 items; items 11, 12 and 20 are not required

Hypotheses

H₀: There is no significant difference between the mean responses of the heads of building section and chief/senior technologists (builders) with respect to their perceptions on the retraining needs in managerial function in building construction industries. Data that answered hypothesis 1 are presented in table 3a and 3b.

Table 3a: Z-test Analysis of the Response of Heads of Building Section and Chief/Senior Technologists (Builders) on Re-Training Needs in Managerial Function in Building Construction Industries.

Mean Response	N	Mean	Std. Deviation	Std. Mean	Error
Heads of Building Section	69	3.0290	.70650	.08505	
Chief/Senior Technologists (Builders)	148	2.9257	.80044	.06580	

Table 3b: Z-test Analysis for Equality of Responses of Heads of Building Section and Chief/Senior Technologists (Builders) on Re-Training Needs in Managerial Function in Building Construction Industries.

	Levene's Test for Equality of Variance		Z-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig	Z	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	5.454	.020	.918	215	.360	.10331	.11253	-.11849	.32511
Equal variance not assumed			.961	149.047	.338	.10331	.10331	-.10917	.31579

The Z-calculated value of 0.918 in table 3b is less than the table value of +/- 1.96. This suggests that there is no significant difference between the mean responses of heads of building section and chief/senior technologists (builders) in items which addressed re-training needs of building technology graduates in managerial function in building construction industries. Therefore, the null hypothesis was accepted.

H02: There is no significant difference between the mean responses of the heads of building section and chief/senior technologists (builders) with respect to their perceptions on the retraining needs in building structures in building construction industries. Data that answered hypothesis 2 are presented in table 4a and 4b.

Table 4a: Z-test Analysis of the Response of Heads of Building Section And Chief/Senior Technologists (Builders) on Re-Training Needs in the Area Of Building Structure in Construction Industries.

Mean Response	N	Mean	Std. Deviation	Std. Error Mean	Error
Heads of Building Section	69	2.8406	.88489	.10653	
Chief/Senior Technologists (Builders)	148	2.8514	.88344	.07262	

Table 4b: Z-test Analysis For The Equality of Response of Heads of Building Section And Chief/Senior Technologists (Builders) on Re-Training Needs in Managerial Function in Building Construction Industries.

	Levene's Test for Equality of Variance		Z-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig	Z	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	2.589	.109	1.322	215	.188	.15110	.11431	-.07421	.37641
Equal variance not assumed			.1279	122.602	.203	.15110	.11815	-.08279	.38498

The Z-calculated value of 1.322 in table 4b is less than the table value of +/- 1.96. This suggests that there is no significant difference between the mean responses of heads of building section and chief/senior technologists (builders) in items which addressed re-training needs of building technology graduates in building structures. Therefore, the null hypothesis was retained.

Discussion of Findings

The findings revealed that management in building construction industry involves a combination of activities that convert raw resource inputs into defined functioning output. The result shown that, out of the twenty-nine (29) items presented in research question one on re-training needs of building technology graduates in building structures in building construction industries three (3) items were not required. In line with Marbel and Olomukoro (2012), re-training of workers is necessary for effective vibrant intent of skills and knowledge for the job execution. This indicates that building technology graduates required training and re-training programmes to manage any construction project in a good and appropriate time and budget at all level of construction works.

In order to achieve good management on construction industries, the findings were also in line with Obiegbu (2012) who asserted that the items found required should be taken very seriously during training and re-training process. Bamisile (2004) also affirms that, to achieve specified quality standards at first attempt, all the site activities must be gotten right at first attempt by trained workforce in the building production process. There is no significant difference between the mean responses of heads of building section and chief/senior technologists (builders) on retraining needs in managerial function in building construction industries and the null hypothesis was accepted.

The findings on re-training needs of building technology graduates in building structures revealed that building structure is an organized combination of connected parts (elements) which are constructed to perform a require function. Also, the manner in which the choice of materials are put together to form building elements in modern building construction has also revealed that building technology graduates need training and re-training to beef up, upgrade and as well update themselves in the techniques of building production. Out of the twenty-one (21) items presented in research question two on re-training needs of building technology graduates in building structures in building construction industries, three (3) items: mathematical calculation in design, structural framework and structural principles and workability of designs and materials were not required. This implies that training and re-training is highly necessary for the items that are found required for the building technology graduates either newly employed or promoted in order to operate effectively and efficiently in the construction projects.

Substantiating the above statement Abdul (2011) and Stephen and Christopher (2005), emphasized that graduates of building technology in the construction industry need to acquire competences on practical skills for the manipulation and arrangement of building elements. They also drew attention to the fact that, graduates need to enumerate the appropriate safety factors, determine the quality of different building materials, building production techniques and motivate workers for a job well done. In order to have intended knowledge and curb the failure in

building structures, training and re-training must be considered based on the result of research question two. There is no significant difference between the mean responses of heads of building section and chief/senior technologists (builders) on re-training needs in building structures in building construction industries and the null hypothesis was retained.

Conclusion

Training and re-training has been a tool used to boost the initial formal training, bridge the gap of graduates' inability in their diverse discipline and motivation of employees in a direction that increase the effectiveness and organizational goal achievement. The study identified training and re-training needs of building technology graduates in building construction industry. The findings highlighted the area that needs training and re-training and the extent to which retraining needs of building technology graduates can change building construction industries in the area of managerial function, building structure. The findings revealed that conversion of raw resource inputs into defined functioning output for structural building required effective management through trained workers. Conclusively, building technology graduates need retraining needs to manage the available resources and as well construct technically when workers are newly employed, promoted or there are changes in technology.

Recommendations

Based on the findings and discussion carried out, the following recommendations were proffered:

- Nigerian Institute of Building (NIOB) and other related bodies nationally and internationally should assist the building industries in training and re-training building technological graduates through their various training and re-training programmes especially in managerial function and building structures. This can be achieved through workshop, seminar, and conferences among others.
- National Universities Commission (NUC) and The National Board for Technical Education (NBTE) should consider and include those areas required for training and re-training in the review of university and polytechnic building technology curricular and other related programmes as it may concern.

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