

**ASSESSMENT OF THE TRAINING NEEDS OF CRAFT SKILL WORKERS IN  
NORTH-WESTERN NIGERIA**

**BY**

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## DECLARATION

I declare that the work in the thesis titled “**ASSESSMENT OF THE TRAINING NEEDS OF CRAFT SKILL WORKERS IN NORTH –WESTERN NIGERIA**” has been performed by me in the Department of Building under the supervision of Dr. Y. M. Ibrahim, and Dr. A. D. AbdulAzeez. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at any University.

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.....

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## CERTIFICATION

This thesis entitled ‘ ASSESSMENT OF THE TRAINING NEEDS OF CRAFT SKILL WORKERS IN NORTH –WESTERN NIGERIA’ by MUHAMMAD, BIRNIN -KEBBI UMAR meets the regulations governing the award of the degree of Master of Science of Ahmadu Bello University Zaria, and is approved for its contribution to knowledge and literary presentation.

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## DEDICATION

In memory of my father, **Mallam Muhammadu Mammani**, who made this thesis and the others possible, may your gentle soul rest in perfect peace. Amen.

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## **ABSTRACT**

Training of construction craftsmen in the Nigeria construction industry which should have enhanced productivity and competitiveness has suffered a lot. This study assessed craft skills training needs in the North-western Nigeria. The objectives of the study included identifying general and specific craft skill training need, extent of the need, militating factors against craft skill training and effective training methods. Purposive sampling technique was used in administering questionnaires (140) to professionals (40) and some selected craftsmen (100) within small, medium and large construction companies in the North- western Nigeria. Questionnaire survey was used to collect data from craftsmen on site and professionals that are directly involved in building production. Mean score and standard deviation of each item was determined and ranked accordingly. SPSS version 16.0 was used in this analysis. The study revealed that, lack of assessing worker's training needs prior to training program has a mean score of (3.308), lack of adequate tools / equipment has (3.189) and high cost of training has (3.126), and these were ranked high among the major factors militating against craft skill training. Understanding drawing has a mean score of (3.304), basic safety has (3.284) and multi skilling has (3.170), and these were among the training areas that should be given higher priority in training craftsmen under study. For effective craftsmen training methods, the result shows, traditional apprenticeship training has a mean score of (3.304), practical demonstration has (3.018) and on the job training has (2.996). It was concluded that assessment of craft skill training need is an important strategy through which construction companies identified and respond to their training areas in their respective companies. It was recommended that master craftsmen (foremen) should be encouraged and supported to train craftsmen on site.

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## **CHAPTER ONE INTRODUCTION**

### **1.0**

#### **1.1**

#### **Background of the Study**

The construction industry is the sector of the economy that plans, designs, constructs, alters, refurbishes, maintains, repairs and eventually demolishes buildings of all kinds (Jaggar, and Smith 2000). Construction industry in Nigeria is built on a foundation of skill craft workers who are primarily supplied through various sources such as craft training institutions, vocational or technical colleges, on the job training and apprenticeship (Yakubu, 2003). Ubenyi (1999) and Anigbogu (2002) opined that the labour-intensive nature of construction activities in Nigeria was attributed to the predominance of large number of small-scale construction firms that rely solely on skilled and unskilled labour for their operations.

Some studies (Obiegbu, 2002; Bokinni, 2005 and Njoku, 2007) have indicated the existence of shortages of quality craftsmen in the Nigerian construction industry. Some of the root causes of the shortages are as follows; aging of skilled craft workers in the industry, decline in the number of new entrants into skilled trades, poor funding and ineffective state of vocational education and training system in the country. Other causes include poor image associated with construction labour as work done by less intelligent people, lack of commitment by government and the construction industry toward training and development.

The Oxford English Dictionary defines training as “practical education in any profession, art or craft”. Ying, *et al.* (2008) also defines training as identifying, assuring and helping to develop the key competencies that enable individuals to perform current or future jobs. Training in this context, is seen 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 organisation (Swanson, 2001). Training in the construction industry refers to a technique that is used to improve the capabilities of personnel in order to improve their productivity and increase turnover, absenteeism, injuries and rework (Muya *et al.* 2003; Ying, 2008).

Assessment of training needs is a vital part of the training design which endeavours to investigate the performance 'gaps' of people in their jobs in order to identify what needs to be learnt. For training to be effective and efficient it must therefore start with a "need" which can be identified as a "gap" between training deficiencies and skills (Fadil and Ruslan, 2006) "Gaps" can also include differences between the existing and desired competencies and skills (Janice, 2003). However, need assessment assists organisation in identifying competencies and performance of employees or work teams, problem solving or productivity issues and assist organisations to prepare for and respond to future changes in the organization or job duties.

Without training needs assessment, there can be no way of knowing whether the training process is correctly designed or not (Bee and Bee, 1998; Janice, 2002; Fadil and Hassan, 2006). This study therefore focused on the training needs at individual craftsmen (personal) level with a view to identify the training deficiencies. Hence, the need to identify craft skill training needs in the Nigerian construction become necessary.

## **1.2 Statement of the Research Problem**

The scarcity of qualified craftsmen impacts on construction projects in every stage of project life cycle from the initial scoping to completion, and the effectiveness of the construction industry in every country depends on the quality of the trained workforce (Muya, *et al.* 2004; Porter, 2005). Expanding and improving craft training is critical in order to improve skills, attract younger craft workers into the industry, decrease injury rates, and greater use of new technologies (Dantong, 2006). However, for any training

program to be useful and efficient, it must start with a needs assessment (Fadil and Ruslan, 2006).

Dantong (2006) has lamented the high level of neglect accorded to training craftsmen and artisans in the Nigerian construction industry. It was observed that, the training of construction craftsmen in Nigeria which should have enhanced productivity and competitiveness has suffered a lot. Many initiatives have fallen short of their intended objectives with a resultant mismatch between the training offered and the workforce training needs (Fadil and Ruslan, 2006). This in turn leads to poor workmanship, low productivity, late completion, cost overruns and high accident rates (Dandong, 2006).

Past researches (Wahab, 1991; Odusami, 2009) tended to focus on investigating training needs of project managers and site managers, in the Nigerian construction industry. This suggests that construction craft skill training is either not fully appreciated or is not considered important enough to receive the attention it deserves (Aniekwu and Ozochi, 2010) despite its importance to the industry. There is therefore necessary the need to explore craft skill training needs in the Nigerian construction industry in order to allow for training needs to be more closely harmonized with development priorities and the delivery methods.

### **1.3 Justification for the Study**

A study like this that aims at investigating craft skill training needs is of significant importance to the Nigerian construction industry. The study will provide training managers and professionals with the knowledge of how to identify training needs within an organization in order to help direct resources to the areas of greatest need. The study will also allow the training managers to set the training objectives by answering two very basic questions: who, if any, needs training and what training is needed in the organization. The findings of the study will also increase better coordination of

workers' training. This is in line with Augusto *et al.* (2009) suggestion that more research is needed to identify craft skill training needs in the construction industry.

## **1.4 Aim and Objectives**

### **1.4.1 Aim**

The aim of the study is to assess craft skill training and training needs in the Nigeria construction industry with a view to improving their training programs.

### **1.4.2 Objectives**

The objectives of the study are:

- (1) To articulate existing knowledge on general craft skill training and training needs in Nigerian construction industry.
- (2) To identify specific craft skill training needs in the study area.
- (3) To identify and assess factors militating against craft skill training in the Nigerian construction industry.
- (4) To identify effective training methods for craft skill workers in the Nigerian construction.

## **1.5. Scope and Limitations**

### **1.5.1 Scope**

The study addressed (informal) skills gap of craftsmen in the North- western Nigerian. The skills include masonry, carpentry, plumbing, painting, and iron bending in the construction industry because these categories of skills are the most common and available in every construction activities (Abdullahi, 2010) in the country. The study

focused on the perception of construction professionals and the craftsmen from small, medium and large construction companies located in the North-western Nigeria, which include Kaduna, Katsina, Kano, Kebbi, Jigawa, Zamfara and Sokoto. This is because of high rate of constructions activities and craftsmen within the cities.

The professionals include architects, civil engineers, builders, and project managers who have at least five years working experience in the industry. This is because these professional are more directly involved in building production. Emphasis was given to professionals employed in medium and small firms because it is believed that as supervisors, they are more knowledgeable about craft skills training requirements. Professionals working in public service and those in private practice were not considered because it is thought that their involvements in construction works are mostly on consultancy basis.

### **1.5.2 Limitation**

The study acknowledges the limitations that may be imposed by lack of covering the country as a whole. The study further acknowledges the limitation that may be imposed by the method of data collection that was used, i.e., questionnaire survey. Although this method has been used in various construction researches, it however has its own limitations such as availability and accessibility of respondents and the question of representativeness of samples. Similarly, surveys can only show the strength of statistical association between variables and they provide no basis to expect that the respondents correctly interpret the questions. All these may impact on the generalisation that can be made from the results. The study also acknowledges the non inclusion of craftsmen categorisation in the study because majority of the craftsmen in the construction industry acquired their training on the job Ubenyi (1999) and Anigbogu (2002).

## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

#### **2.2 The Nature and problems of Construction Craft skill Training**

Craft skills training currently exists both formal (classroom) and informal (on-the-job training) in Nigerian construction Dantong (2006). Ying (2009) posits that craft skills can be learned on- site through apprenticeship or other training programs. Skilled craftsmen such as carpenter, bricklayer, plumber, and other construction trade specialist need either several years of information on the job experience or apprenticeship training. Most construction workers learn their work skills informally, observation and leaning from experience workers. Individual who lean the trade on the job usually starts as helpers. These workers performed routine task, such as learning and preparing the worksite and unloading materials. Another alternative is to attend skills training in

vocational/ technical schools or other education institutions where formal classes and handsome training are combined (ETA, 2004).

Majorities of Nigerian construction labour force is self employed Ubenyi (1999) and Anigbogu, 2002, and are often farmers from rural areas. Typically young workers are often recruited through friends or relatives (often foreman) they are low skilled, earn low wages, and hence are least effective (Sugiharto, 2010). These young workers enter the pool of construction workers for it is the only industry that can provide employment for those without any academic qualifications even though continuous employment is not guaranteed (Sugiharto, 2010).

Construction as an industry often faces many difficulties ranging from internal weaknesses to external threats that affect and influence its performance. In both developing and developed countries, these weaknesses and difficulties are usually compounded by the shortage of skilled and qualified people which often results in cost and time overruns, avoidable rework, waste, idle resources, accidents other includes claims, disputes and bankruptcies (Dainty, *et al.* 2004; Kumaraswamy, 1997). Rowing *et al.* (1996) argued that many of the problems faced by the industry arise from a need to maintain a skilled and competitive workforce continuous improvement of the workforce is vital for the sustainability and competitiveness of any construction workforce for both the client and contractors. Chan (2002) asserts that the capability of the construction industry to develop, procure and deliver innovative, complex and demanding projects, is driven by involvement of highly knowledgeable and skilled craftsmen. Kazaz, Ekrem, and Sardar (2008) observes that the best which can be applied to get a productivity boom by construction management is the selection of the right people who have been duly groomed through trainings to control certain functions. However, Ying (2009) found that one of the greatest obstacles to implementing a

quality training program for any organization is lack of funding. Contractors fear they will lose jobs if they include the cost of training in their bid packages. Trade associations cannot establish or implement training until they have a commitment from contractors to support and pay for training.

Researches (Yakubu, 2003; Awe, 2007 and Lakum, 2007) found that the major problem for lack of craft skill training in the Nigerian construction industry was due to ineffective vocational and technical education in the Nigeria, poor funding, low public recognition, lack of facilities and equipments. Others include; poor trained teachers, poor incentive for teachers, inadequate curriculum and rapid rate of technological changes. Another important set back in training of crafts men is the persistent claim that construction employers (contractor) do not encourage employee training (ILO, 2001).

Muya, *et al.* (2006) observes that, most important employers in construction industry are reluctant to invest directly in training their workers; they rather prefer to recruit workers trained by other companies. Others are poaching of craftsmen by construction companies hence, leading the way for further declined and shortages of skill in the industry. Gunderson (2001) opined that, the fear that workers would move after completing their training, thereby removing any potential gain of investment in training, deterred many firms' especially smaller ones, from training workers. The ILO (2001) observed that workers in the construction industry are reluctant to invest in their own training because of the insecurity of employment and levels of unemployment. Contractor's are reluctant to invest in training because of there is a good chance they will lose trained workers to other firms.

The last decades (ILO, 2001) show a decrease in the amount of work directly accomplished by main contractors and a parallel tendency of passing an increasing proportion of the work over to subcontractors. Craft workers are hired for a specific job and laid off at its completion, indicating a lack of concern for the individual and a need for individual improvement. In this situation only a main contractor fulfils a project management function. There are two major reasons which cause (Druker and Croucher 2000) the above-mentioned changes. Firstly, main contractors trying to complete the majority of construction works with own labour has to face unproductive expenses connected with an unstable workload and an irregular orders portfolio. Dismissal of workers is an option in order to reduce unproductive expenses. The second reason is connected with the owner (Druker and Croucher 2000) virtually all labour is now hired only when immediately required and laid off as soon as workloads fall. This brings about a general undermining of collective wages, social protection, and industrial relations in favour of work contracts or task works, casual employment and agency labour or, at the professional level, domestic work and freelance employment (Druker and Croucher, 2000). However, eliminating one problem results in a new one arising: the growth in labour-only subcontracting and self-employment has led to a decline in training, and this is illustrated by the direct correlation between the fall in trainee numbers and increasing self-employment (Janssen, 2000).

Eventually, the skills of workers will not develop as it is very rare that a formal training is provided by labour-only subcontractors or the self-employed themselves because of insufficient facilities, funds or will for training these groups ( Syben, 1998). Where the vocational training system ignores the real needs of the construction market, this unquestionably works against the well-being of the industry. It would be hard to find anyone who would claim that skill training or qualification improvement is useless, but,

when it comes to finding time or money for them, the attitude is not so favorable. Investing in the workforce should be supported by the knowledge that it really pays off and yields measurable profit finding a compromise between the interests of the different parties in order to motivate them to improve the competence management of construction craftsmen which eventually will contribute to the welfare of the whole construction industry

Thus the reorganisation of training programs must achieve the following:

1. Address the need for rapid skills formation to achieve the quantity and quality required to meet the nation's development programme;
2. Create synergy with the changing realities of the industry;
3. Promote access to training and career progression by the workforce, and emerging enterprise;
4. Create an equitable and sustainable financing system for training and education, which recognizes the need for all participants to contribute;
5. Align professional training needs to be more closely harmonized with development priorities and the delivery approaches; and
6. Develop a focus on the specific requirements of public sector delivery management. (Druker and Croucher 2000; Ziderman, 2001).

## **2.2 The Need for Craft skill Training In the Construction Industry**

Investment in training has been identified as key to addressing the persistent problem of construction craft skills shortage in many construction industries of the world (Dainty et al. 2004; Mackenzie et al. 2000). However, the repeated pattern of the construction market most often discourages companies to invest in HRD, including construction craft skills training. A further hindrance is that unlike investment in capital assets such as plant and machinery, companies do not have property rights over human capital created by the

training invested in their workers (Ziderman, 2001). Thus, the design of any sustainable training mechanisms for the construction industry requires recognition of these problems, otherwise success will most of the time be short-term, as history has consistently shown from many studies reported in the literature (Ziderman, 2001).

Many factors are increasing the need for more craft skill training in the construction industry; first workforce demand in the construction industry is rising and is expected to grow in to unforeseeable future due to non availability of qualified craftsmen in the industry, which result to delay in many projects executions (Ying, 2008). The Construction Labour Research Council predicts that 185,000 new workers need to be attracted, trained, and retained each year up to 2016 in order for the industry to replace expected turnover and to sustain industry growth expectations (CLRC, 2005). Muya *et al.* (2005) identify the need for developing countries to improve productivity in all sectors if they want to compete successfully in an era of rapid economic and technological changes. Improved productivity requires not only capital investment, but also a workforce that has the flexibility to acquire new jobs created as the structural of economies and occupations changes.

Bokinni (2005) also found that the need for skills development in the construction industry is imperative due variability and complex nature of the construction projects which require continuous supply of trained and skilled personnel to match the numerous challenges often encounters. Muya *et al.* (2006) identify two factors that are generally considered as prime determinant of quality of a workforce, labour productivity or the amount of goods and services produces by a workforce and flexibility of the workforce or the ability of the workforce to adopt changes as a result of development in technologies and the ability of the workers to move across of the economy and between industries as the structure of the economy changes. The level of competencies of a countries skill

workers and technicians is a key determinant of labour force flexibility and productivity. These factors are increasingly significant to countries seeking to expand economies' and improve the welfare of their citizen in a highly competitive and rapidly changing world (Middleton *et at.* 1999). Datergeom (2006) posits that the need for skills development in the construction industry can also be view from introduction of new technological changes such as the introduction of new, stronger and lighter materials such as plastics, composites fibres, optics etc. Increase utilization of assembled component and the adaptation of new construction process and prefabricated components.

The International Labour Organization's World Employment Report (ILO, 1998) highlighted some of the central elements of the challenges for developing countries. While the attraction for low labour costs of migrant workers from less developed countries may be seen as posing the threat of 'diluting' the skilled craft workforce in developed countries (Syben, 1998), in many developing economies, skilled construction workers are all too often imported from relatively developed Construction craft skills training in Africa 1999 neighboring countries at the expense of a locally trained workforce. The argument used to justify the use of foreign craft workers is that the quality of local artisans is low .However, the needs for more crafts kill training are driven by many factors example, the construction sector introduces changes in the technology used in site production in pursuit of better methods of construction and greater efficiency e.g. prefabrication. These changes in technology impact craftsmen skills by changing the nature of their work (Clarke, 1992; CIB, 1998; Gann and Senker, 1998).

Similarly, the increased use of concrete frames requires craftsmen with steel fixing skills to work with steel reinforcement. Secondly, the increasingly diverse selection of materials and components used in the contemporary construction sector is altering the skills required from each craft (Clarke, 1992; CIB, 1998; Gann and Senker, 1998). In

plumbing, the traditional plumber worked mainly with copper and lead but currently plumbing works also encompass items made of copper, steel and plastic using different non-traditional jointing methods, hence demanding new skills to work with all these materials, whilst at the same time making the old skills less critical.

Moreover, craft skills are affected by the widespread adoption of new materials that create new trades in the construction sector e.g. the introduction of asphalt gave rise to the asphalt trade (Clarke, 1992). Likewise, changing work methods (which may well be driven by new production technologies) give rise to new site work practices that impact upon craftsmen skills (CIB, 1998; Gann and Senker, 1998). The increasing degree of mechanisation in site production works requires craftsmen with more technical and knowledge-based skills. Craftsmen skills are in addition impacted by the changing employment relationships which modify their work responsibilities. For instance, some employers are demanding soft skills like customer focus from the craftsmen (Dainty *et al.* 2005). Other drivers of changes in skill requirements include inadequate training causing craftsmen to get employment in markets that differ from the skills they have acquired and the increase in maintenance works that are increasingly demanding multi skilled craftsmen. As a consequence of the changing work environment of the craftsmen, the knowledge, skill and attitudes they require to do work have altered (Clarke, 1992; CIB, 1998). Muya *et al.* (2003) identified several factors needed to provide continuity in training provisions for construction project stakeholders, including: Sustainable financing; appropriate recruitment, training and retraining strategies; availability of local training courses; availability of financial incentives to train workers; and alternative recruitment options, including attracting craft-workers currently employed in other industries.

However, Ziderman (2001) argued that, unlike investment in capital assets such as plant and machinery, companies do not have property rights over human capital created by the training invested in the workforce. This leaves room to the problem of ‘poaching’ the tendency by companies to recruit workers trained in transferable skills from other firms, rather than train their own employees. The problem of poaching in the long run discourages firms to invest in the training of their workforce. Because of this market failure, it becomes necessary for governments to intervene through provision of financial resources as well as via regulatory frameworks that diversify complementary sources of finance from beneficiaries of the training that is supplied using public resources.

Wachira (2001) identify the following as the major factors that causes training and development in organization includes:

- i. When there is high rate of absenteeism among workers.
- ii. Where there is increased labour turnover among workers.
- iii. When there is decline in productivity among workers.
- iv. When there is a poor job performance among workers.
- v. When new machines are purchased to replace old ones.
- vi. When there is increase in the rate of on-the-job accidents among workers.
- vii. When there is an increased complaint from customers.
- viii. When there is reduced patronage from customers.
- ix. Where there is visible negative work attitudes such as lateness and oscillation (motion without movement or pretending to be busy when he or she is really idle) among workers.
- x. When there is noticed inability to take up challenges among workers.
- xi. When there is noticed reduction in job involvement and organizational commitment.

Muya, et al. (2003) identified several factors needed to provide continuity in training provisions for construction project stakeholders, including, sustainable financing, appropriate recruitment, training and retraining strategies, availability of local training courses, availability of financial incentives to train workers; and alternative recruitment options, including attracting craft-workers currently employed in other industries.

### **2.3 Training Design Process in the Construction Industry**

Training spawns from the realms of learning within the context of human resource management, it is recognised as one of the most effective vehicles for promoting learning of people that will in-turn benefit the organisations, (Fadil and Ruslan, 2006). It should be aimed at promoting as much continuing learning and re-learning of people as possible and can be very significant in contributing to their performance improvements (Handy, 1999). Training was conceived as an evolving cyclic process from renowned scholars on training (Anderson, 1994; Wilson, 1999) suggest that the process of training should comprise of: (i) *Training needs and Training Needs Analysis (TNA)*; (ii) *Training Design*; (iii) *Training Implementation*; and (iv) *Training Evaluation* must be a dynamic process. Therefore, the importance of involving workforce in development, planning and implementation of competency-based strategies in order to have a successful organization has been emphasized by a number of researches (Buyens *et al.*, 2001; Iatagana, *et al.* 2010).

#### **2.3.1 Training Needs and Training needs Analysis (TNA)**

Training needs analysis (TNA) is a vital part of the training design process which endeavours to investigate the performance ‘gaps’ of people in their job to identify what needs to be learnt (Anderson 1994; Reid and Barrington 1994; Garavan 1997). Without TNAs, there can be no way of knowing if the training process is correctly designed (Bee

and Bee, 1998; Wills, 1994; Anderson, 1994). For TNAs to be holistic, the three processes of: (i) identifying the range and extent of training needs from business needs; (ii) specifying the needs precisely; and (iii) analysing how best training can be carried out must be observed. This should be carried out at the organisational level, job-level and person level within the organisation to be accurate (Bee and Bee, 1998; Wills, 1994; Anderson, 1994; Bramley, 1996; Truelove, 2001). Observations, Questionnaire surveys, fact-finding interviews are the common methods for collecting TNA data whilst project managers, training consultants, trainees and/or trainers should be the key parties to the TNA (Reid and Barrington 1994; Fletcher 1997). Training needs assessment is the first step in the establishment of a training and development program. It is used as the foundation for determining instructional objectives, the selection and design of instructional programs, the implementation of the programs and the evaluation of the training provided. These processes form a continuous cycle which always begins with a needs assess.

### **2.3.2 Training Design**

The design stage of the training follows the TNA stage. During this stage, it is very important that training methods selected must match the training needs, and the training strategy and planning must be appropriate to the training objective and circumstances (Johnson, 1997; Reid and Barrington, 1999). A structured training programme design would normally include: review of training objectives; determine learning activities; assess training times; construct timetable; and briefing the trainers, organisation and the preparation of training materials and equipment. The key parties that must be involved in the training design should include: the organisation; the line or project management;

the training manager and/or the training officer; and the trainee (Rae, 1995). Training ‘interventions’ which entails a deliberate intentional learning (Abdullah, 2001) must match the organisational culture, management style and motivation (Osborne, 1996).

### **2.3.3 Training Implementation**

Training implementation is putting the training design into practice. The mechanistic traditional’ training approach has now greatly changed, replaced with the modern approach that emphasise more of coaching and facilitating (Raid, 1995). The training spectrum may varies from highly directive to free-learning, guided-learning, lecture/discussion, presentation, instruction and conditioning for individuals or as a group (Johnson, 1997).The training needs to be different for different people but concurrent with the different kinds of tasks they undertake (Mathews *et at.* 2001). In most situations, formal training entails deliberate and structured presentation of experiences and must be related to its purpose (Thomson, 1990). The training policy and plan must be the key reference for implementing training (Anderson, 1994). Task force exercise, case discussion, simulation and games; role-play exercise, group discussion, individual exercise, presentation/lectures and behaviour modelling are the common training methods (Abella, 1987), and may be carried out through external or internal providers (Bee and Bee, 1995; Anderson, 1994). The trainer must be committed and equipped with wide ranging toolkit of ideas, techniques, methods and approaches which can be adopted as when most appropriate

### **2.3.4 Training Evaluation**

Training evaluation is the assessment of the total value of a training system, which considers the training course or programmed in social as well as financial terms. It is an attempts to measure the overall cost benefit of the course (Bee and Bee, 1998; Anderson, 1994). It must encompass a systematic collection of data relevant to the

selection, adoption of training and developmental activities, and must be an ongoing process from which continuous corrective action can be introduced to ensure an ever-improving training (Johnson, 1997). There are differing views as to who should be evaluating the training, but most views tend to agree that senior managers, line managers, training manager, trainer and learner must be included (Odini, 2000; Torrington and Hall, 1991).

## **2.4 Sources of Information for Training Need Assessment**

Janice and Diana (2002) identified three levels of needs assessment which includes; organizational analysis, task analysis and individual analysis. Organizational analysis looks at the effectiveness of the organization and determines where training is needed and under what conditions it will be conducted environmental impact, state of the economy and the impact on operating costs, changing work force demographics and the need to address cultural or language barriers, changing technology and automation, increasing global/world market places. Others are political trends such as sexual harassment and workplace violence, organizational goals (how effective is the organization in meeting its goals), resources available (money, facilities; materials on hand and current, available expertise within the organization), climate and support for training (Janice and Diana, 2002).

### **2.4.1 Sources of Information for Organization Need Assessment**

Janice and Diana (2002) identified information needed to conduct an organizational analysis can be obtained from a variety of sources including: Organizational goals and objectives; mission statements; strategic plans, staffing inventory; succession planning; long and short term staffing needs; Skills inventory; both currently available and short and long term needs; organizational climate indices: labor/management relationships, grievances, turnover rates, absenteeism, suggestions, productivity, accidents, short term

sickness, and observations of employee behavior, attitude surveys, and customer complaints. Analysis of efficiency indices: costs of labor, costs of materials, quality of products, equipment utilization, production rates, costs of distribution waste, down time, late deliveries, and repairs, changes in equipment, technology or automation. Others include; annual report, plans for reorganization or job restructuring; audit exceptions; reward systems, planning systems, delegation and control systems. Employee attitudes and satisfaction, task analysis provides data about a job or a group of jobs and the knowledge, skills, attitudes and abilities needed to achieve optimum performance (Janice and Diana, 2002).

#### **2.4.2 Sources of Information for Task Need Assessment**

There are a variety of sources for collecting data for a task analysis which includes; job description, a narrative statement of the major activities involved in performing the job and the conditions under which these activities are performed. If an accurate job description is not available or is out of date, one should be prepared using job analysis techniques. Knowledge, skill and attitude (KSA) analysis a more detailed list of specified tasks for each job including knowledge, skills, attitudes and abilities required of incumbents performance standards; objectives of the tasks from the job and the standards by which they will be judged. This is needed to identify performance discrepancies. Observe the job/sample the work perform the job (Janice and Diana, 2002). Job inventory questionnaire; evaluate tasks in terms of importance and time spent performing. Review literature about the job-- research the "best practices" from other companies, review professional journals. Ask questions about the job; of the incumbents, of the supervisor, of upper management analysis of operating problems; down time, waste, repairs, late deliveries, quality control (Janice and Diana, 2002).

#### **2.4.3 Sources of Information for Individual Need Assessment**

According to Janice and Diana (2002) Individual analysis analyzes how well the individual employee is doing the job and determines which employees need training and what kind. Sources of information available for an individual analysis include: performance evaluation; identifies weaknesses and areas of improvement. Others includes; performance problems, productivity, absenteeism or tardiness, accidents, grievances, waste, product quality, down time, repairs, equipment utilization, customer complaints. Observation; observe both behavior and the results of the behavior. Work samples; observe products generated. Interviews; talk to manager, supervisor and employee ask employee about what he/she believes he/she needs to learn. Questionnaires; written form of the interview, tests, must measure job-related qualities such as job knowledge and skills. Others are; Attitude surveys, measures morale, motivation, satisfaction, checklists or training progress, Charts; up-to-date listing of current skills

Janice and Diana (2002) also posit that in a situation where the needs assessment identifies more than one training need, the training manager, working with management, prioritizes the training based on the urgency of the need (timeliness), the extent of the need (how many employees need to be trained) and the resources available. Based on this information, the training manager can develop the instructional objectives for the training and development program. All three levels of needs analysis are interrelated and the data collected from each level is critical to a thorough and effective needs assessment. Each training stage is comprised of sub-elements and these sub-elements must be approached systematically if the usefulness of the training initiative is to be maintained.

## **2.5 The Impact of Training and Craft skill Formation in Developing Countries**

In most developing countries construction skills are still mainly acquired through an informal apprenticeship system. Yuson (2001) found that in the Philippines, an estimated 95 per cent of construction workers acquire their skills in this way while in Egypt (85%) eighty five per cent of craftsmen are trained through traditional apprenticeships (Assaad, 1993), and a similar situation prevails in Brazil, India, Kenya and Mexico and Nigeria. Vocational training schools do exist in most countries, but many workers and contractors see formal training as an unnecessary expense rather than an investment (Yuson, 2001) can only be persuaded to undergo training if they are paid for lost time. However, informal training has limitations, notably a restricted learning opportunity (learning by doing), a narrow and static range of skills and the difficulty of instruction in new techniques (Assaad, 1993).

In many African countries the informal apprenticeship system is not well developed and the master craftsmen who do the training may themselves have very limited skills (Assaad, 1993). Another problem, noted in Malaysia, is that the passing on of skills through informal apprenticeship is often kept within the family, clan or tribe, and when circumstances dictate that skills should be transferred to “outsiders” there may be some dilution, with not all of the skills passed on (Abdul-Aziz, 2001). Singapore experienced such a dilution of skills as the original *kepalas*, who were immigrants from China with considerable skill, were replaced by more recent immigrants with little or no previous experience of work in construction (Deborah and Ofori, 1997). The informal method of skill acquisition can come under particular strain when there is a sudden and/or sustained increase in construction activity, or when there is pressure from clients for better quality buildings or more rapid completion (Deborah and Ofori, 1997). Situations commonly arise during the process of economic growth and social change, as

economies industrialize and incomes begin to rise, such as is now happening in the newly industrializing countries.

For example, in Malaysia pressure from clients for rapid completion is straining the traditional informal training system. Skill shortages first appeared in the early 1980s and then again in the construction boom of 1988 to 1997 (Abdul-Aziz, 2001). In India, the scarcity of skilled workers in the face of increased demand for them has led to a situation where the big contractors are now thinking of investing in training and the newly formed Construction Industry Development Council has taken (Abdul-Aziz, 2001) up training as a priority area. In Brazil and in Trinidad the demand from clients for higher quality building is also causing concern amongst contractors about lack of skills (Yuson, 2001) and leading to a new interest in training. In the Philippines, there is an influx of foreign contractors who are setting higher quality standards (with many high-rise buildings) which means that local contractors may have no choice but to raise their standards and quality of work (Yuson, 2001).

However, the high turnover of workers poses a considerable barrier to formal training in the construction industry. Workers are reluctant to invest in their own training because of insecurity of employment and high levels of unemployment; contractors are reluctant to invest because there is a good chance they will lose trained workers to other firms (or other countries) (Philips, 2000). The contractors' reluctance is also based on the fact that training costs money, which (at least in the short run) will raise the price of their bids and could make them uncompetitive. The cyclical pattern of construction output adds to the problem – nobody wants to train in a recession and nobody has time to train in a boom (Philips, 2000). A further difficulty is that the majority of owners (clients) build only once, which means that they will not contribute to training costs that will benefit

only future owners (Philips, 2000). These obstacles to training can be overcome by joint action. Collective agreements between the social partners that all will share in training can ensure that all contractors put training costs into their bids and so avoid “free rider” problems. Most developed countries, and some developing ones, have introduced such schemes, and others (e.g. the Philippines) are now attempting to do so (Philips, 2000).

The schemes are usually funded through a levy on employers that can subsequently be reclaimed (a grant/levy system). However, the development of new training schemes based on collective action is being hampered, and existing schemes undermined, by declining union density, the weakening of collective bargaining and/or the shift towards subcontracting. For example, in Brazil (Philips, 2000) funds for training are raised through a 1-2 per cent tax on the payroll, part of which is channelled from the government training agency through a contract with the employers’ organization to provide training. But with the dramatic fall in the number of registered workers the funds for training have decreased, while the increased use of subcontractors has made it more difficult for workers to attend classes. The training is mostly provided in the evening in local schools, which are spread around the country and far from construction sites (Philips, 2000).

The employers’ organization in São Paulo complains that these training funds are meeting the needs of local communities rather than those (Philips, 2000) of the construction industry. There is also provision for literacy training, but the high mobility of labour and long journeys to work make it difficult to organize literacy or any other kind of training. In Mexico, and also in Kenya, employers have cooperated to fund joint training schemes financed by a levy on turnover (0.2 per cent and 0.25 per cent

respectively). But in both countries the declining share of registered contractors in total output and employment has reduced the scope and effectiveness of these schemes.

In Kenya, the construction industry levy account (in the Directorate of Industrial Training) had accumulated a credit balance of more than US\$850,000 (Ziderman, 2001) by the end of 1997. The failure to spend the funds accumulated for training is attributed to the reluctance of the main contractors to train and the exclusion of subcontractors (most of whom are unregistered) from the scheme (Wachira, 2001). Apprenticeship training was funded by a levy of 25 cents to \$1 on each hour of work done by each employee. The costs were passed on to owners in the tender, as part of the collectively bargained labour rate. Employers contributed knowing that all would do the same. However, the rise of the open shop and the fall in union membership led to a dramatic decline in apprenticeships and to the “poaching” of labour (Philips, 2000).

In several other countries, where training is based on collective agreement among the social partners, there is clear evidence that the growth of labour-only subcontracting and self-employment has undermined workplace training. As large general contractors have given up the direct employment of labour, they have abandoned their responsibility for training, thereby distancing themselves from the skill needs of the construction process. The subcontractors who are now the real employers of labour are small or very small firms, with more limited organizational and technical capacity and lacking the time and resources to invest in human capital development (Ziderman, 2001; Wachira, 2001).

A further problem that has been noted in Spain, the United Kingdom and a number of other countries is a narrowing of skill development, as the heightened (Ziderman, 2001) division of labour into ever more specialized trades, which is implicit in subcontracting, limits the range of skills that can be acquired in any one enterprise. This means that all-

round craftsmen and general supervisory workers are very difficult to train. In many countries the public sector used to provide stable employment and a good training ground, but its role in training has diminished as public sector units have been disbanded. Skill deficits appeared in many developed countries in the 1990s owing to the undermining of training.

It may be concluded that in both developed and developing countries the change in the employment relationship in the construction industry has raised the barriers to training and also led to problems in implementing joint training schemes. Clearly, a way has to be found of involving subcontractors and labour intermediaries *in* training programmes if current skill shortages are to be overcome (Ziderman, 2001).

## **2.6 Training Concept**

Education is the process of acquiring background knowledge on a subject which normally takes place at school and colleges or through private studies. Training on the other hand, refers to leaning to use this knowledge or simply the application of knowledge to work Bokinni (2005). Thus, education imparts knowledge while training imparts skills. Both are necessary for the development of workers. The Oxford English Dictionary training as a practical education in any profession, art or craft. The human resources development (HRD) definitions are not differing significantly. It's generally stated as a systematic and planned effort to modify or develop knowledge, attitudes, abilities and skills through learning experiences, to attained effective performance in an activity or a range of activities (Garavan, *et al.* 1995). Many definitions and interpretations of training and development can be found within the HRD literature For instance.

Ying (2007) Defines training and development as identifying, assuring and helping to develop the key competencies that enable individuals to perform current or future jobs. Training was also considered as a process, Swanson and Holton (2001) define training and development as a process of systematically developing work-related knowledge and expertise in people for improving performance. While providing specific training, a training and development effort can further be designed to increase an individual's level of self-awareness, skills and motivation to perform his or her job well.

Van Wart *et al.* (1993) suggest that training is application driven and aims to impart skills that are useful immediately in particular situations. They argue that although general principles are introduced in training, discussion of them is limited because they are used to reinforce specific learning points. Training and development are generally considered as planned effort by an organization to facilitate the learning of job-related behaviour on the part of its employees; job-related behaviours can include any knowledge and skill acquired by an employee that can be related to organizational goals (Wexley and Latham, 1991). Therefore, it needs the effective ways and methods in order to improve the performance. Thus, organizations are required to find proper training methods in HRD practices for training the staff and labour. The key themes of training and development are learning and individuals in organizations (Russ *et al.*, 1997). Therefore, the field of training and development is directed toward individuals and learning is its key method of inducing change (Roth well *et al.* 1995).

Muya *et al.* (2004) reported a number of factors that influence skill availability, including training provisions which govern the supply of skills; sector volume capacity, which drives the demand for skills; and other socio-cultural as well as public policy sector determinants of skills development. One efficient technique used to improve the

capabilities of construction professionals is training. Muya *et al.* (2003) emphasised that appropriate training can only be developed if training needs are carefully identified; this requires interested parties to understand and anticipate the skills needed from their staff.

## **2.7 Basic Steps in Establishing Training**

In the construction industry, for training to be relevant, it should be both demanding and directed towards upgrading the skills of those who are already in the work, or within the premise of work (Loop Vander, 1992). Adesoji (2008) opine that “for training to be productive, it must be systematically planned and executed. Training is necessary when there is a gap between the existing performance of an employee (or group of employees) and the desired performance to assess whether such a gap requires a skill analysis.

Aidelomoh (2010) confirmed that training is like sharpening an existing skill in order to reflect the trends in technology. According to Prince (2002), training function is a management activity in which the personnel department provides the necessary specialists knowledge and usually carries out the training activities in addition to the administrative requirements and tasks so that the organization function operates effectively. He went further to state the following basic steps in establishing training;

- a) To find out the training needs of a particular organization at all levels.
- b) To formulate a training policy that will meet the needs of the organization.
- c) To evaluate the resources both financial and material that could be required.
- d) To provide the necessary specialist training officers or supervisor who will be responsible for implementing both the training policy and the training plan.

## **2.8 Categories of Skilled manpower in the Construction Industry**

Ubenyi (1999) posits that manpower in the construction industry is broadly categorised in to unskilled and skilled manpower. Unskilled manpower refers to those personnel

that work in the industry without any prior training or skills acquisition. Skilled manpower on the other hand, refers to a category of manpower that has acquired the necessary training and experience to do something well (Longman English Dictionary 2012 updated version). The level of formal education and experience gain through career practice dictate the category to which each skilled personnel in the construction industry belong (Ubenyi, 1999). Dantong (2006) found that skilled manpower in the construction industry can be categorized in to three broad cadres as: professional cadre, middle level or technical cadre and lower level technical cadre or craftsmen. Ubenyi (1996) have identify skills manpower in to the construction industry in to three groups based on the level of construction education attained, job specialty, skills and experience: professional/ managerial level manpower and sub professional level and crafts.

### **2.8.1 Construction Professionals**

A professional refers to someone whose occupation requires extensive education or specialized training (Encarta dictionary, 2008). In the construction industry, they are personnel who mostly acquire their training instructions of the higher learning such as universities and polytechnics. These highly trained professional in the construction industry include; Architects, builders, civil, quantity surveyors, land surveyors, town planners estate mangers service engineers, construction managers etc. (Ubenyi, 1999). They actively take part right from the conceptualization, design and up to the construction stages of projects in the industry. Due to their technical knowledge, they manage both human as well as material resources for the building projects implementation. Managerial levels are usually to have a college degree Technical and specialized occupations require more training as a greater technical knowledge is required. These professions also hold more legal responsibility. Ibrahim (2010)

identified short lists of the professionals with an outline of the educational requirements are given below:

1. Architect - Typically holds at least a 4-year degree in architecture. To use the title "architect" the individual must be a member of the Nigerian Institute of architect and registered with the regulatory body.
2. Builder- holds a degree in building. He must be a member of The Nigerian Institute of Building and must be registered with the council of registered builder of Nigeria to be addressed as a builder.
3. Civil Engineer – holds a bachelor’s Degree in civil engineering and must be a member of The Nigerian Society of engineer. Must be registered with the Council of Regulation of Engineering to be addressed as an Engineer.
4. Building Services Engineer - Often referred to as an "M&E Engineer" typically holds a degree in mechanical or electrical engineering. Must be registered with the Council of Regulation of Engineering to be addressed as an Engineer
5. Quantity Surveyor - Typically holds a degree in quantity surveying. Must be a member of The Nigerian Institute of quantity surveyors and registered with (QSRB)
6. Town planners- they hold a degree in urban and regional planning and must be a member of The Nigerian institute of town planners.
7. Estate surveyors or considerable experience in their specialty (ETA, 2004) cited in (Ibrahim, 2010)

### **2.8.2 Sub-Professionals (Middle level Technical Cadre)**

This refers to construction personnel usually trained to be supervisors, foremen overseers, and technical draught men (Ubenyi, 1999). They usually obtain their training

from polytechnic, technical, or trained on the job over a long period of time. They normally share with the responsibility of coordinating the activities of crafts men and artisans. Craftsmen are usually expected to practically sound in ensuring the observation of all process of constructions. Craftsmen can be from any of the following disciplines; electricians, plumbers, welders, etc.

### **2.8.3 The Craftsmen**

According to Akindoyeni (2005) a craftsman refers to a person male/female who has been instructed in the fundamental theory of a particular craft. Craft can also be a hand on process for the production of an artifact or the components part of a physical product. Ubenyi (1999) describe construction craftsmen as those trained and skilled operatives who work manually with great expertise in various stage of the construction work. The craftsmen play a critical role in the practical realization of any construction projects; they are mostly engage in the technical aspect of the construction works. They constitute the main skilled practical workforce of the contractor and are engage from inception of construction projects to its end. Craftsmen are identified as (ITF, 2005): Bricklayers (Masons); steel fixers; electricians; carpenters; painters; plumbers; etc. Dantong (2006) to have described the craftsmen as the lower level technical cadre of manpower in the construction industry whose qualification ranges from apprenticeship certificate to the other formal trade certificates which falls below the national diploma. According to Ibrahim (2010) construction trades/ Artisans include;

1. Bricklayer, a tradesman who lays bricks to and construct brickwork. The term also refers to personnel who use blocks to construct block work walls and other forms of masonry.

2. Carpenter, a skilled craftsman who performs carpentry - a wide range of woodworking that includes constructing buildings, furniture, and other objects out of wood. The work generally involves significant manual labour and work outdoors, particularly in rough carpentry.
3. Heavy equipment operator drives and operates heavy equipment used in engineering and construction projects.
4. Electrician, a tradesman specializing in electrical wiring of buildings and related equipment. Electricians may be employed in the construction of new buildings or maintenance of existing electrical infrastructure.
5. Landscaper, is a tradesmen that specializes in gardening
6. Painter and decorator, a tradesman responsible for the painting and decorating of buildings, and is also known as a decorator or house painter.
7. Plasterer, a tradesman who works with plaster, such as forming a layer of plaster on an interior wall or plaster decorative mouldings on ceilings or walls.
- 12 Plumber, a tradesman who specialises in installing and maintaining systems used for plumbing, heating, drainage, potable (drinking) water or small-sized industrial process plant piping.
- 13 Steel fixer, a tradesman who positions and secures reinforcing bars and mesh used to reinforce concrete on construction projects.
14. Tiller, tradesmen who works on tile in peoples home.
15. Welder is a tradesman who specialises in welding materials together

## **2.9 Crafts skill Training Methods in the Construction Industry**

Adams (1992) defined training methods as the fundamental catalysts and stimulators for learning. He noted that in developing countries, training methods have been variously called training techniques, training or educational methodologies. In his comparative review of the most often utilized training methods he observed that there is no global consensus on preferred methods, or on definitions of training methods. This was affirmed in the work of Ogunlana, Thapa and Dey (2002) investigated various training methods for different categories of construction firms. They concluded that there is no method that can be identified as the best method. In fact, it is not a question of ‘either/or’ but of which method is appropriate for a particular purpose, at a specific time, and in certain circumstances. Training methods are means through which ideas, skills and knowledge are impacted to learners in an organized manner. There are different types of training methods that are in use today. They are categorized under two broad headings:

- i. On-site-training
- ii. Off-site-training

Tabassi and Bakr (2009) identified the differences between off-site and on-site training in the construction industry in the table below;

**Table 1: Off-site Training versus On-site Training**

<b>Variable</b>	<b>Off -site training</b>	<b>On -site training</b>
Emphasis On:	Learning basic facts and skills	Getting the job done
Ultimate Goal:	Knowing”	Developing “best practices
Knowledge: -oriented:	Static, De-contextualized, General	Dynamic, Situated, Practice Arise from and embedded in work situation
Topics / Problems:	Given by curriculum	Individual, Group,
Scope of Learning:	Primarily Individual	Organization

Source: Tabassi and Bakkar (2009)

## **2.9. On-Site-Training**

The most common type of on-site training is on the job training where workers learn their job by actually doing the job or receiving one – on one instruction that’s usually from a senior supervisor in how to do the job (Alwi, 2010). Desler (2007) define on the job training as, training in the normal job situation where a person learns the job by actually doing the job. On-site training is the training received while the operation of a job is on under a superior or an expert on the job (Adediran, 2011). Field Personnel, i.e. construction operatives apply this learning immediately to tasks for which they are responsible. It requires no special school, and while learning, the trainee is also contributing to the total output of the job (Surgihato, 2010). The most familiar method of on the job training (OJT) is on coaching or understudy where an experience supervisor trains the employee on the job. These training programs were mostly executed on site during the construction process.

The training which was mostly under the control of quality control department was design for workers in order to fulfill the needs according to their specific jobs such as painting, carpentry, mason etc (Surgihato, 2010). The training focus on educating craftsmen not only how to complete their jobs but effectively and efficiently in the correct manner without comprising the quality, but also how to identify all error occurred, as easier as possible during the construction process and report the errors, if any, to their supervisors. To better meet the need of on- the- job training it’s important that training programmers’ are design to the responsive to the demand for training rather than simply providing a supply mechanism to deliver pre package courses in pre determined areas of training. The major advantage of OJT is that, it is relatively in expensive as trainees learn while producing and there is no need for onsite facilities like classrooms. OJT may sometimes be combined Adesoji (2008) with off- the job training. This is a widely accepted method of developing workers used by most organizations.

According to Adesoji (2008), “workmen perform much better in any organization when they undergo training through on-the-job training programmes. This method brings about good working relationship because employees get to know one another and the working environment better. It tempts the “learner” to grasp the training faster as he imagines himself doing the task under no supervision soonest. On the other hand, this method could give birth to monotony of work, and also using unqualified personnel for supervision when the qualified ones are undergoing the training. On-site training could take the following forms: Training by experienced workmen and apprenticeship (Datergeom, 2006; US Bureau of Labour Statistic; 2000).

### **2.9.1 Purpose of on-Site-Training**

The main purpose of the on-site-training is to increase labour productivity during the construction process. Training benefits construction firms by providing qualified labour especially field personnel who are better able to handle the demands of today’s construction environment. The Construction companies will appreciate on-site-training programmes consequent upon the increased quality of field personnel. By increasing their quality, higher field personnel productivity is achieved (Sugiharto, 2002). To better achieve on-site training needs, it is important that training programmes are designed to be responsive to the demand for training rather than providing a supply mechanism to deliver pre-packaged courses in determined areas of training. Training should bear a high degree of relevance to the work that field personnel currently do, or to the work which was planned to be done. Ultimately, the success of any training activity will depend on individual motivation of the participant and the commitment of the construction firm from which they come (Sugiharto, 2002).

### **2.9.2 Training Methods under On-Site Training**

There are various training methods under on-site training but the most common ones area discussed below;

- 1) **Job rotation:** This is a situation in which employees are made to move from one job to another within the work setting over a defined period of time. As they move from one task to another, they gain considerable knowledge, experience and skill. The duration of the rotation is shorter at lower (levels), than at management levels where trainees are taught complex functions and responsibilities (Aidelomoh, 2010).
- 2) **Coaching:** Here, employees are placed under the direct guidance of a supervisor. This technique uses observational learning known as pure imitation. It has the advantage of allowing the coach to give on the spot feedback to the learners on whether they do it well or not (Surgihato, 2002). Others include; internship, understudy assignment (Surgihato, 2002 and Akpan, 2008).

### **2.9.3 Benefits of On-Site Training**

The followings are the benefits of on-site training as advanced generally most cost-effective. Employees are actually productive; opportunity to learn whilst doing i.e. training is received whilst remaining in the workplace. Training alongside real colleagues, Skill is gained and you perform better on the job and Needs no classroom or other infrastructures.

## **2.9 Off-Site Training**

This training method is organized outside the workers' job location. It is usually organized in a training centre or an educational institution. The objective of this method is to broaden the trainee's job knowledge and experience beyond what can be learnt within the job environment. It provides the trainees the opportunity of interacting with

trainers who are different in outlook, experience and knowledge from those they are used to at work Aidelomoh (2010). Off-the-job training has its own disadvantages which may include:

- i. It is usually more expensive than on-the job training and
- ii. It does not allow on-the-spot assessment of training effectiveness which is possible with “on-the-job” training (Aidelomoh,2010).

## **2.10. Some Training Methods under Off-Site Training**

Many training methods exist under off site training the most common ones are discussed below;

### **2.10.1 Vocational or Technical Education**

The most popular method of off- the – job training is formal vocational or technical education. Oni (2007) describe vocational educational as education provided for the mastery of skill and knowledge in some selected occupations as well for the development of personality for useful living. Vocational education enable individual to learn about, explore and prepared for trades in any of the career cluster in manufacturing, construction, communication and transportation, (Oni, 2007) It entails the deliberate and structured presentations of experiences, which may help individuals to change their knowledge, understanding, attitudes or behaviors in a positive manner (Prince, 2002). It is a more formal training program than apprenticeship where basic theory classroom instructions and related subjects are combining with some practical on- the job-training (Dategeom, 2006).

Yakubu (2003) defines vocational and technical education as "a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of

practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life". Sonaiya (2008) found that in Nigeria, public vocational education and training has two elements- technical and vocational educations. Technical education is offered for middle-level technical manpower. It is mostly provided by polytechnic. Vocational education on other hand is learning and training experience (Wachira, 2001). Training in school is expensive because of the infrastructure that has to be put in place. Learning in school may not be comprehensive enough compared to learning on-the-job. A lot of time is wasted in school training before any positive achievement is obtained. Some of the many problems of vocational and technical education in Nigeria as identified by many researchers (Oranu, 2000; Awe, 2007; Yakubu, 2003 and Lakun 2007) includes the following; poor funding, low public recognition, acute deficiencies in facilities and equipment. Others include, poorly trained academic staff, misconception of the nature of vocational education, inadequate political will by the government, deficient education monitoring and evaluations, poor incentives for teachers, unplanned expansion and enrollment, inadequate curriculum and a rapid rate of technological changes. These problems have to be of varying degrees, affected the advancement of vocational and technical education in Nigeria. These types of training as observed by Aidelomoh (2010) includes: Seminars: workshop lecture or classroom method, vestibule training, briefing groups, professional training, induction training, skill acquisition, skill development.

## **2.11. Formal and Informal Training**

These are means by which we intend to communicate information, ideas, skills, attitudes and feelings to learners (Cole, 2005). There are two broad types of training methods namely, formal and informal training.

### **2.11.1 Formal Training**

Prince (2002) it entails the deliberate and structured presentations of experiences, which may help individuals to change their knowledge, understanding, attitudes or behaviors in a positive manner in industry, formal training is used for any of a variety of specific purposes as stated below:

- a) Induction Training: It involves the introduction of the new entrant to the undertaking and its ways including the structures, rules and procedures of the company to enable him to cope with the new environment.
- b) Skill Acquisition: It is the development of new skills and abilities. Where 'deskilling' of work takes place, semi-skilled machine operators may be provided with the kind and degree of training necessary to acquire the required skill.
- c) Skill Development: Training is employed to 'up-date' a person's knowledge or skills at any stage of his career and whenever changes occur in his work such as where new technology is introduced. In the latter case, short courses, which provide information on the 'new thing' and offer the opportunity to learn and practice new skills or new application of old ones may be undertaken.
- d) Increasing Motivation: It entails deliberate use of training to increase individual's willingness to work up to the required pattern and standards. This rests on the belief that people motivated are likely to work more effectively. They understand not only what they are expected to do, but why they are expected to do it in a certain way. The inculcation of work-related values and norms is possible in training.
- e) Attitude change: Training may be undertaken to change the perspective and attitudes of workers adopt in relation to the organization and their work in a

positive way. It could develop into employees trust, commitment to the organization, job involvement and job satisfaction.

### **2.11.2 Informal Training**

Middleton *et al.* (1991) defined informal skilling, which includes both informal skills training and informal apprenticeship, as an unsystematic method of learning skills on-the-job which is received within the context of day to day production activities. It mainly involves learning via observing and doing and is largely confined to initial employment training with limited continuation of training and skills upgrading. Informal skilling is geared towards the transmission of existing practices without or with minimal external input (e.g. from colleges). The implication of this is that the master's ability to train is limited to his current skill and knowledge and this often results in low productivity (Ziderman, 2001).

Informal skilling is common in the construction sectors of many developing countries e.g. Philippines, Indonesia, Egypt, India, Mexico and Brazil (International Labour Organisation, 2001; Alwi *et al.* 2006). In the Western Cape province of South Africa, 31% of the craftsmen, 54% of semi-skilled operatives, and 68% of the general operatives are trained informally. In Iran, Sri Lanka and China the number of craftsmen trained informally are 95%, 80% and 90% respectively (Jayawardane and Gunawardena, 1998).

In many of the developing countries of Sub-Saharan Africa, including Kenya, employment in the formal sector has been shrinking as a result of a combination of poor economic performance, structural adjustment policies (SAPs), and a growing number of job seekers entering the job market resulting from high population growth rates (Ziderman, 2001). Consequently, job seekers are entering the informal sector in

growing numbers and creating a significant need for skills development. Accordingly, informal skilling is the most prevalent mode of training in the informal sector (Johansson and Adams, 2004). Moreover, in Kenya and South Africa, informal skill training is further encouraged by the low levels of formal craftsmen training (Construction Industry Development Board (CIDB), 2004) as exemplified in South Africa by the reduction of trainees from 5697 in 1970 to 769 in 1990 (Catelli *et al.*, 1996). Informal skills training and apprenticeship has thus become common, especially among young people who, for various reasons, are unable to progress up the academic ladder; or gain admission to vocational training institutions; or those of all ages who cannot find employment in the formal, sector (Kent and Mushi, 1995; Johansson and Adams, 2004).

In Kenya, the informal sector is estimated to be training more school leavers than all formal vocational training institutions combined (Ziderman, 2003) making it a significant contributor to skills development. Additionally, informal skills training is attractive in developing nations because it is self-financing in that it takes place without any funding from budget-constrained governments or formal levy funding by relying mainly on user fees or low wages for the apprentices during training (Ziderman, 2003). Moreover, informal skills training and apprenticeship has expanded because many of the existing formal training institutions are ill-prepared to equip trainees with the skills needed to operate in an informal sector which is fast becoming the dominant employer (Kent and Mushi, 1995; Ziderman, 2001; Johansson and Adams, 2004). Informal skills development is generally unregulated and is characterised by the following features (Kent and Mushi, 1995; McGrath *et al.* 1995):

### **2.11.3 Advantages of Informal Training**

Ziderman (2011) identify the following advantages of informal training in the construction industry as follows;

1. Entry into the training regime has little or no emphasis on academic qualifications; hence it is open to all including those who are illiterate.
2. No standard cost of training; i.e. there are no set fees hence little commonality in the charges among providers even for similar skill areas or trades. The cost of training is usually in the form of payment of a lump sum (which may be converted into monthly instalments) to the providers or via the apprentice's acceptance of low wages during the training.
3. Ad hoc curriculum; i.e. no prescription of syllabus, subject content or method of assessment, and theoretical knowledge is largely ignored. Training is production-oriented, revolving chiefly around workplace instruction only.
4. Training providers have no formal qualifications either as tradesmen or as trainers. This is mainly because many of the masters *cum* trainers acquired their skills informally too.
5. Pedagogy is limited to learning by doing (trial and error) and is based on tacit knowledge with little use of diagrams, books or models. What the trainee learns is dependent on the work in progress and the relationship is founded on 'master and man' rather than 'teacher and pupil'. Additionally, very little emphasis is placed on the creation of a healthy and safe work environment or on the safe use and correct selection of tools and materials.
6. The progress and capability of the trainee/apprentice is dependent on the level of instruction necessary to enable him / she to work unsupervised and no value is given to independent assessment like trade tests.

7. Training is suited for self-employment, accentuating getting the job done rather than procedural correctness. By the end of the training the trainee has some work experience and has established links with potential informal employers.

#### **3.11.4 Disadvantages of Informal Training**

Ziderman (2001) identified the disadvantages of informal skill which include:

1. The narrow and static range of skills offered.
2. Restricted opportunity for learning to work effectively.
3. The minimal knowledge of materials (behaviour and characteristics) and processes may affect the quality, reliability and safety of use of the final product.
4. The minimal theoretical knowledge and *ad hoc* curriculum erodes the necessary foundation for new skills thus making it difficult to learn.
5. Lack of standardised training and independent testing makes it difficult to control the quality of the training.
6. There is a lack of appropriate scale of equivalence by which the knowledge and skills acquired can be externally vetted hence the competence of the graduates is difficult to vet.

## **2.12 Organization Associated with Craft skills Training**

In the Nigerian construction industry there are organizations that are responsible for training craftsmen and they are discussed below;

### **2.12.1 National Board for Technical Education (NBTE)**

The national Board for technical education is a principal organ of federal ministry of Education specially created to handle all technical and vocational education falling outside the University education. It was established by act No 9 of 11<sup>th</sup> January, 19977. In addition to providing standardized minimum guide and curricula for technical and

vocational education and training (TVET), the board supervised and regulates, through an accreditation process, the programmed offered by technical institutions at secondary and post secondary levels, it's also involved with the funding of polytechnics owned by the federal government of Nigeria (NBTE, 2008). Obiedu (2002) identify the functions of the board as follows; advising federal government on coordination of all aspect of technical and vocational education falling outside the university system and make recommendations on policies necessary for full development of technical and vocational education training of technicians, craftsmen and others middle level manpower in the country.

### **2.12.2 Industrial Training Fund (ITF)**

The industrial training fund (ITF) was set up under the Act No 47 of 1971 to promote and encourage the acquisition of skill in the industry and commerce with a view to generating a pool of indigenus trained manpower sufficient to meet the need of the economy. The act provides that the scheme is to be finance through contribution from employers and subvention front hr federal government, (ITF, 2000). The aim of the fund is to share the cost of training evenly between the firms in Nigeria construction industry (Bokinni, 2005). Part of the contributions by employees is to be disbursed for the development and support of training programmes. The funds bear's parts of the cost reimbursed for the incurred by the employers in training their employees by reimbursing employers. Other benefits includes; general available of trained and mobile manpower throughout the economy, guidance of the training advisers of the fund and the access to the wealth of information and expertise which the fund has built over the year (ITF, 2000).

### **2.12. 3 National Directorate of Employment (NDE)**

The (NDE) started in 1986 as a strategy for dealing with mass unemployment among

youth in Nigeria. It was aimed at enhancing the employment prospect and opportunity for youths through the provision of job oriented training programs (Ogwumuke, 2001), the objectives of the NDE as elaborate by Echebiri (2001) includes; design and implementation of program for combating mass unemployment, articulate of policies of aimed at developing work programmes with labour intensive potentials and obtaining and maintaining a data bank on employment to serves as clearing house for linking job seekers with employers. The directorate has four main programmes which includes; vocational skills development programmed (VSD), the special public works program (SPW), the small scale enterprises programmed (SSE) and the agricultural employment programmed. The vocational skill development is concerned with skills acquisitions and development and has four main schemes under it: the national open apprenticeship scheme (NOAS), school on wheels programmed (SWP) the disable scheme (DS) and waste to wealth scheme, (WWS). The National open apprenticeship scheme was design to provide beneficiaries with basic skills that needed in the economy. This is achieved by attaching youths as apprenticeship to companies, ministries, and parastatals and to professionals' craftsmen and women. Some are given admission in to formal vocational training institutions to learn trades. Approved training organizations and craftsmen are paid some fees for imparting skills to beneficiaries of the scheme (Echebiri, 2005). The school on wheel scheme is an attempt to extend the national open apprenticeship scheme, which is predominantly urban based, to the rural areas so as to check rural urban drift of youth who have no comparable training opportunities in their areas (Echebiriri, 2005). The scheme boast to have to have trained over 766,783 persons including the disable in the National open apprenticeship scheme between 1987 and 1996 Ogwumuke (2001). The major problem of the directorate as reported by (Ogwumuke, 2005) is in adequate funding.

## **2.13. Some of the Factors Militating Against Craft skill Training**

The researches examine some major barriers that prevent construction companies from conducting training among the major ones are discussed below;

### **2.13.1 High Cost of Training Craft skill**

One of the greatest obstacles to implementing a quality training program for any organization is lack of funding (Ying, 2009). Contractors fear they will lose jobs if they include the cost of training in their bid packages. Trade associations cannot establish or implement training until they have a commitment from contractors to support and pay for training. Most training programs are funded either by charging students tuition or by collecting contributions from employers on the basis of hours worked. A few programs are funded by a combination of both. Government budgets are usually the main source of financing for craft skills development in conventional training markets; especially pre-employment training, employers and trainees represent possible sources of funds to improve training outcomes. The levy system is the most common means of ensuring industry's involvement in training in both developed and developing countries (Johansson, 2002; Ziderman, 2001; Clarke and Wall, 1998).

Revenue generation schemes, where levy proceeds are used to finance training provided by public-sector institutions; and levy-grant schemes aimed at encouraging training investment by firms. While training funds have been established in 30 of the 47 countries of SSA, most of the funds in the region were centralised in design, but fell short of the standards required to operate them (Ziderman, 2001). Their weaknesses included deficiency in design, poor implementation or malfunction and that quite often the money raised was diverted to uses other than that for which it was intended. Sector or industry-based training funds offer an alternative to the centralised national funding model.

### **2.13.2 Aging and Retirement of Craft skilled Workers.**

Currently, craft training is insufficient to keep pace with the demand for qualified craft workers. This situation is aggravated by an aging workforce and the high retirement rates of experienced craft workers (Haas *et al.* 2003). Aging and retirement have been repeatedly identified as a factor responsible for the shrinking of skilled and qualified craftsmen in the construction industry (Obiegu, 2002 and Bokinni, 2005). Danton (2006) and Obiegu 2002 have reportedly that the average age skilled and qualified craftsmen in the Nigerian construction industry ranges from 45-50 years and 48 years respectively. The problem is made worst by the demographic decline in the number of young ones ready to enrol in to skilled trade careers in construction Obiegu, (2002) has warned that if care is not taken craft skill and artisan in the Nigerian construction industry will go in to extinction.

### **2.13.3 Lack of Assessment of Craft workers' Training needs**

Muya *et al.* (2004) reported a number of factors that influence skill availability, including training provisions, which govern the supply of skills; sector volume capacity, which drives the demand for skills; and other socio-cultural as well as public policy sector determinants of skills development. One efficient technique used to improve the capabilities of construction professionals is training. Farrell and Gale (2003) strongly recommended mandatory attendance at training programs for novice before they are allowed to take charge of construction sites.

### **2.13.4 Certification of Skills**

Researches (Wachira *et al.* 2006) have lamented the need for the establishments of a common platform for certification of skills in the construction industry due to the large presence of craftsmen who acquired their skills informally and have not tested and certified have been proposed by many writer. The system will serve as a quality

assurance mechanism where accreditation will focus more on performance. Based on the actual skills or competencies performable by the persons, UNESCO; 2007) the system would also contribute in recognition prior learning and skills training through informal means and thus, provide motivation for employees and skills upgrading. This would take place via integration of both formal and informal training so that all competent craftsmen (irrespective of their training background) are accredited and certified. Mackenzie *et al.* (2000) observed that, in the UK, that construction employees perceived that the construction skills certification Scheme (CSCS) as the best approach for tackling skills shortages in the sector. The benefits of the scheme for the individual are recognition for skills, competence and qualifications, and the promotion of greater health and safety and personal training awareness. For employers, the benefits of the scheme include; identification and recruitment of the right people, raising quality standards and improved standards of health and safety awareness, (Mackenzie *et al.* 2000)

#### **2.13.5 Greater used of New Technologies**

There is growing perception, especially in some developed economies that greater use of new technology in the construction industry should be adopted as alternative means of mitigating labour shortages. Mackenzie (2002) to have opined that new technology tends to reduce the demand for labour because most often new inventions and innovations are labour saving. Similar arguments were also advanced for prefabrication. The Construction User Round Table CURT, (2007) assert that, prefabrication is seen and frequently considered as an alternative to the traditional building approach in the face of shortages of skilled construction workers. It provides a mitigating strategy to the increasing skilled construction workforce shortage. Mackenzie (2002) to have noted that the greater use of prefabricated components can result in a substantial reduction in site

labour and the speeding up of the site construction process, with as much as 60% of the value of construction work carried out off-site by suppliers.

## **2.14 Roles of Professional Bodies in Training of Craftsmen**

Professionals and professional bodies have a crucial role to play as part of the regulatory landscape. Professional body membership gives the public, the sector and government assurance that services are being delivered by qualified and expert professionals who are self-regulating based on a code of professional practice (or conduct) that they have developed. These codes set a standard and are a source of professional pride. In addition, there are robust and fair processes for professional bodies to consider allegations that an individual member may have breached the code, and if there is a case then to take appropriate action, including removing them from the register of the professional body (Ibrahim, 2010).

Professionals and professional bodies have an even more powerful role to play as part of the improvement and self-improvement landscape. Professional bodies give the public, the sector and the government confidence that individual professionals will be striving to continuously improve their skills, knowledge and expertise to offer the highest quality and exemplary professional services they can to their learners. Professional bodies have the potential to really tap into and help ignite more enthusiasms and ambition among individual; teachers and trainers to develop, hone and strengthen their practice to benefit learners.

The professional bodies in the Nigeria construction industries according to Ibrahim, (2010) include;

1. The Nigerian institute of building.

2. The Nigerian institute of architect.
3. The Nigerian institute of quantity surveyors.
4. Nigerian society of engineers.

#### **2.14.1 Nigerian Institute of Building (N.I.O.B)**

Nigerian Institute of Building (NIOB) is a body whose key objectives include the "promotion of the science, technology, management and practice of the building profession in all its aspects and ramifications" it further seeks to "establish and maintain a high standard of competence and conduct of those engaged or about to be engaged in the building profession. They act as a body which the government and organization (s) could seek advice, assistance or the expression of views on any subject(s) of concern or interest to the building profession in Nigeria. The NIOB, together with CORBON, undertake the further training and continuous professional development of registered builders to ensure that they remain competent, responsive and relevant professionals in this technological world with respect to the Profession of Building (Ibrahim, 2010)

It is the professional (registered) builder. This stand is supported by the provisions of the National Building Code 2006, which provided in section 13.12 (1-4) - that is in charge of Workmanship and Supervision. Among all other professionals the builder works closely with the allied skills required for the production process - the artisans and craftsmen which are invaluable to the construction process.

Jambol (2010) also reveals that for the training and development of artisans and craftsmen, government should establish Vocational and Technical Training Centers, revisit the polytechnic and encourage them to go back to their original mandate of

producing technically proficient graduates trained with the requisite skills rather than the present craze for degree qualifications.

Similarly, the Nigerian Institute of Building (NIOB) has offered to improve artisans' skills through regular training programmes, nothing that it would admit them into a specially created membership cadre while providing a curriculum for their training scheme. The body, in conjunction with the Chief Newton Jibunoh Foundation (CNJF), has disclosed plans to establish an institution of learning to produce skilled personnel. Similarly, the Lagos State Government established an Artisans Skill Development Centre at the Ikeja Central Business District (CBD) to train industry technicians to attain the status of professionals. The Lagos State Development and Property Corporation (LSDPC) attached some 500 artisans to the state-owned polytechnic for training in carpentry, bricklaying, electrical works and plumbing to meet its manpower requirements (Ibrahim, 2010).

#### **2.14.2 Nigerian Society of Engineers (NSE)**

The Nigerian Society of Engineers (NSE) is a voluntary association established by the practitioners of the profession while the Council for the Regulation of Engineering in Nigeria (COREN) is a statutory organ of Federal Government, established by decree and concerned with certificate of persons for the purpose of practicing the engineering profession in Nigeria.

COREN is a statutory organ of the Federal Government established by Decree No.55 of 1970, as amended by Decree 27 of 1992, which empowers it to control and regulate the practice of the engineering profession in all aspects and ramifications in Nigeria. In this respect, amongst other duties

Registers FIVE cadres of engineering personnel, Engineers, Engineering Technologists, Engineering Technicians, Engineering Craftsmen, and Engineering Consulting Firms with each having its own Association, i.e.:

- a) Nigerian Society of Engineers
- b) Nigerian Association of Engineering Technologists
- c) Nigerian Institute of Engineering Technicians
- d) Nigerian Association of Engineering Craftsmen, and
- e) Association of Consulting Engineers of Nigeria (ACEN)

### **2.14.3 Nigerian Association of Engineering Craftsmen**

The Nigerian Association of Engineering craftsmen are a professional body for craftsmen cadre. It was established after the amendment of decree 55/70 by decree 27/92 which empowered COREN to register all cadres of engineering family. The Association was established in 1992 and inaugurated in 1993.

The Foremost objective of the Association is to bring together all engineering personnel within this cadre and the general public together in other to promote quality and professionalism in engineering practice in Nigeria and International Professional Bodies. Also to maintain these standards of professional practices in engineering and related industries and ascertain high academic and professional standards in all related programmes.

The Objective and purpose for which the Nigerian Association of Engineering Craftsmen is constituted are:-

1. To advance the theory and practice of engineering in all the fields of Engineering Crafts.
2. To afford a means for facilitating the acquisition and preservation of the knowledge which pertains to the professional therewith:
3. To represent section in the Council for the Regulation of Engineering in Nigeria (COREN) and other related professional bodies where applicable locally and internationally
4. To represent to any Government the views of the association on any legislative enactment or proposed legislation on any subject's or concern interest to the Association in Nigeria.
5. To maintain high standards professional practices in engineering and related industries and ascertain high academic and professional standards in all the related programmes in Technical/vocational Schools in Nigeria

Registration of Craftsmen is done after a careful examination of the of the quality of experience, training and qualification of persons seeking to become registered engineering personnel, which of course include a minimum of 50% pass level of our professional into view (Ibrahim, 2010).

### **2.15 Causes of Skills Shortages in the Construction Industry**

According to (Druker, and White, 1996) reveals a number of factors, which have combined to influence the construction skills shortfall in recent years, all of which can be seen to stem from the industry's evolutionary development over the last 20 years. These include the demographic downturn and resulting reduction in the number of people entering the labour market the poor image of the industry, which adversely affects popularity as a career choice (Dainty *et al.* 2000) the high number of jobs shed during the recession of the early 1990s, the introduction of new technologies, which

have reconstituted the skills required (Agapiou, *et al.* 1995); failure to develop multi-skilling as a route to overcome skills shortages, the growth in self-employment and the use of labour-only sub-contractors, which have reduced the commitment and investment in training within the industry and wastage rates amongst the industry's principal occupational groups ( Mackenzie, *et al.* 2000). The combination of these factors has led to a labour market reliant upon a casual workforce, incorporating high levels of self-employment, low levels of training investment and hence, low quality skills (Briscoe *et al.* 2000). Indeed, the low level of training investment has been cited as an underlying cause of the high costs and low productivity of the UK industry in comparison with France and Germany (Winch, 1998).

The UK construction training system itself is out of step with many of its European Union partners, being employer-led, largely confined to the traditional trades and dominated by qualifications broken into narrow task-related units (Clarke and Wall, 1998). The inevitable fragmentation that flows from this structure arguably narrows the industry's skills base and delimits innovation within the sector. For the building industry a skills shortage occurs when employers have considerable difficulty filling their job vacancies because there are insufficient job seekers with the required skills

- (1) The first is when a lack of skilled individuals at the current wage, determined by market and industry in which the person is employed, limits the expansion of any given company or organization
- (2) Alternatively, it can be seen to occur when a mismatch between the supply of persons with particular skills and the demand for people with those skills occurs (Clarke and Wall 1998).

Other reasons include; lack of training; inappropriate training; difficulties in attracting people into the industry and retaining them; poor employment conditions and pay. It is

commonly believed that the main reasons craft workers leave the industry include undesirable, relatively low pay and benefits, the generally poor image of the construction industry and its workers, unclear paths in construction, and the transient nature of construction work (Construction Users Roundtable 2001). These reasons were confirmed by the findings of the survey launched by the CII research project RT135 “Attracting and maintaining a skilled construction work force” (Liska *et al.* 2000). The research listed poor pay and benefits, the need for a permanent job, poor safety, and poor treatment and poor working conditions as top five reasons causing workers to leave the construction industry. Differing strategies have been adopted to try to respond to the construction skills shortage overseas. Dainty *et al.* (2004) recommends the development of regional skills strategies targeted at specific regions of a country rather than a single skills strategy for all regions. The study emphasises the need for more effective labour market planning to be done at the regional level to mitigate the effects of future skills shortages.

A focus on training and skills was also suggested by Mackenzie *et al.* (2000) who recommended that industry wide training plans should be developed to anticipate future skills shortages prior to their onset. Multi-skilling of existing labour is another strategy which has been proposed. In the UK, multi-skilling of existing tradespersons has led to increasing confusion about what exactly is the overlap between different trades and whether they can be transparently separated from each other (Clarke and Wall, 1998). However, on the positive side multi-skilling allows a tradesperson to add to their current repertoire of skills while increasing hourly wages as in the USA. In Hong Kong Chan *et al.* (2001) show that the blurring of boundaries at the professional level (architect, engineer, surveyor) has led to the movement toward generalists practitioners who straddle more than one discipline but these professionals are facing a loss of identity.

Collaboration between industry, government and the unions to tackle the skills shortages has been tried in the USA through “Skills to build America’s future”.

## **2.16. Some of the Effect of Skill Shortages**

A shortage of skilled labour (or sometimes simply a shortage of labour) is also a factor behind the drive in many countries to mechanize production in order to raise productivity by replacing labour with machines (ILO, 1995). In many developed countries, there has been a shift in recent decades away from traditional craft methods of building “in situ”, to the production of components in factories and their subsequent assembly on site.

The move to mechanization and prefabrication makes sense in economies where full employment is creating upward pressure on wages, a situation found in Singapore and other East Asian countries prior to 1997 (ILO, 1995). But where there is surplus labour and high unemployment, as is the case in the majority of developing countries, the adoption of more capital-intensive methods seldom makes economic sense and it certainly does not make any sense in social terms. Quite the opposite is the case: employment in construction (as well as in other sectors) needs to be expanded as much as possible in low-income countries to help absorb the growing labour force and lift people out of poverty. This is recognized, for example, in Brazil where off-site prefabrication has been tried, but not considered to be widely appropriate because of higher costs and fewer employment opportunities. Even in developed countries, increased mechanization and prefabrication does not provide a real alternative to raising the level of skills. This is partly because there are limits to the extent to which labour can be replaced by machines and also because new technologies require new skills and can fail if there is inadequate training (Gann and Senker, 1998).

A recent survey of contractors in the United Kingdom indicates that they do not see this as a real solution to skill shortages (Mackenzie *et al.* 2000). Another alternative that is currently being promoted as a solution to the problem of labour and skill shortages arising from the reluctance of young men to enter the industry is to recruit more women. In the United Kingdom, for example, there are currently targets to raise the recruitment of women (currently standing at 1 per cent) to help cope with an anticipated shortfall of new entrants.

However, a survey of major employers (Mackenzie *et al.* 2000) revealed a high level of scepticism about the recruitment of women as a solution to the crisis. This scepticism is supported by recent research comparing the career profiles of male and female construction professionals in the United Kingdom, in which it was found that the construction workplace is a competitive and conflict environment where women are overtly and covertly discriminated against by men, who use structural systems to undermine their participation. The women interviewed were found to have dealt with these barriers in a way which perpetuated existing work cultures, suggesting a self fulfilling cycle of women's continued under-achievement. The findings led to the conclusion that women should not be attracted to the industry unless steps are taken to moderate its exclusionary and discriminatory culture (Dainty *et al.* 2000). Similar findings of overt and covert discrimination are reported from the United States, this time at the level of the building trades rather than the professions (Eisenberg, 1998). A similar situation is reported from India, where it is rare to find women in the building professions (except architecture). In a survey designed to find out why this is so, one government engineer summarized the situation as follows: Construction is the worst model of patriarchal culture.

## **2.17 Solution to Crafts skills Shortage in the Construction Industry**

Pappas (2004) identify the following proposals to solve the problem of craftsperson shortage in the construction are as follows; Educate owners, contractors, and related industry personnel that the competitive low-bid process is an ineffective procurement process that is detrimental to the users and contractors. Promote the use of performance information. Use performance information not to pre-qualify, but to impact the selection of the contractor using information systems, which minimize subjective decision-making. Promote the concept of paying more for proven performance. Change the emphasis from project manager to performing contractor in construction education. Change the paradigm from the owner hiring the project manager to the contractor having their own project manager. Other possible solutions to the craft worker shortage identified by previous research (Liska *et al.* 2000; Pappas 2004) include: Conduct a needs assessment to train workers on continuous basis; Conduct supervisory human relations training; Tie documented wage progress to skill; Provide training incentives; Give long-term preferential treatment to tenured employee; Improve the image of the construction industry; Increase pay; and Reduce demand for labour through the use of automation and technology. Among all possible solutions, appropriate craft training is quite a promising solution to solving the labour shortage in the construction industry.

## **CHAPTER THREE**

### **3.0 RESEARCH METHODOLOGY**

#### **3.1 Preambles**

This chapter considers features of the various research methods used in the study. It outlines the various data collection and analysis methods used. Instrument for data collection is considered in detail. The study involved a review of related literature on the subject matter from books, journals etc. in order to understand and articulate the underlying concepts of craft skills training needs in the North-western Nigeria.

#### **3.1 Sampling Technique and Sampling Size**

Kamya et al.'s (2010) states that three factors that determined size of an adequate sample includes the nature of the population, type of investigation and degree of precise desire. These factors were considered in the choice of sample size. Purposive sampling technique was used in administering questionnaires (140) to professionals (40) and some selected craftsmen (100) within small, medium and large construction companies in the North- western Nigeria.

Purposive sampling technique was used in administering the questionnaires because it is a deliberate choice of respondents due to the qualities the respondents possesses such as knowledge and experience (Sheppard, 2006). Care was taken to select respondents that are currently practicing in the industry. The populations for the study are the professionals and craftsmen. Fagbenle *et al.* (2011) revealed that Federation of Construction Industry (FOCI) maintained a total of 105 companies in their register and they are made up of small, medium and large construction companies in the north

western Nigeria registered with the Federal ministry of labour and productivity of Nigeria.

The statistically required sample size is calculated from the formula given by Adnan et.al (2009) as follows;

$$n = n1 / [1+ (n1/N)]$$

Where,

n = sample size

$$n1 = s2 /v2$$

N = total estimated population = 105

V = standard error of the sampling distribution = 0.05

S = maximum standard deviation in population. Total error = 0.1 at a confidence level of 95% and  $S^2 = (P) \times (1-P) = (0.5) \times (0.5) = 0.25$ , where (P) is the proportion of population elements that belong to a defined class. From the formula (140) questionnaires were required for the research. The questionnaires was distributed to (40) professionals and (100) craftsmen on construction sites.

### **3.2 Data Collection Technique**

Using a structured questionnaire as the instrument for data collection, a survey was undertaken to determine the opinion of professionals and craftsmen regarding the craft workers' training needs in the construction industry. A pilot survey was first carried out to ensure validity and reliability of the instrument with a view to uncover the opinions of the professionals and craftsmen on general and specific craft skill training needs, extent of the need, factors militating against craft skill training and effective training methods within small, medium and large companies located in the north- western Nigeria. The research targeted audience were craftsmen and the professionals who are directly involved in building production because of the nature of the questions asked. Research assistants were engaged to distribute the questionnaires and assist the

craftsmen on site to interpret the questionnaires where necessary. A total of 20 questionnaires were administered to the target respondents in each of the cities in the north western Nigeria.

### **3.2.1 Need Assessment Survey**

The needs survey involved surveying professionals and craft workers within small, medium and large construction companies located in the north western Nigeria who work together on the jobsite to achieve common goals. The goal of the survey was to provide data necessary to bridge the gap between training need and workforce training offered in order to identify what need to be learned. Data collection for the need assessment survey crafts workers utilized face-to-face interviews with construction craftsmen on the jobsites and professionals. All interviewers were bilingual. It was necessary to obtain enough data to draw the questionnaire and evaluate significant conclusions and generate recommendations for the research.

### **3.3 Data Analysis Technique**

The questionnaires were analysed using descriptive statistics technique such as percentages and tables. This is in line with Kanya *et al.* (2010) assertion that analytical surveys are recommended for descriptive studies that involved establishing the opinions of respondents. Respondent were requested to rate them on a 4-point Likert scale in terms of the extent to which the training are needed, with '4' indicating 'high extent' or 'most important' and '1' indicating 'least extent' or 'least important'. Mean and standard deviation of each item was determined and ranked were then assigned to them. SPSS version 16.0 was used in this analysis. The "mean score" method as stated by Odusami (2007) was adopted to establish the mean score of the variables used in assessing the training needs of craftsmen in the construction industry. The "mean score" is mathematically represented as:

$$MS = \Sigma (F * X) / N. (1 \leq MS \leq 4)$$

Where “X” is the score or weight given to each variable by the respondents and ranges from 1 to 4 where;

“n1” is the number of respondents for ‘very important’;

“n2” is the number of respondents for ‘important’;

“n3” is the number of respondents for ‘fairly important’;

“n4” is the number of respondents for ‘not important’;

“F” is the frequency of responses to each rating (1-4), and

“N” is the total number of respondents.

Standard deviation (SD) of the responses was used to measure the variability or dispersion of the responses in a situation where there is a tie in the means (where the two means are the same or have equal score).

## **CHAPTER FOUR**

### **4.0 DATA PRESENTATION AND ANALYSIS**

#### **4.2 Data Presentation**

Table 4.1 shows a total of one hundred and forty questionnaires (140) were administered. One hundred and fourteen (114) were returned out of which twenty-six (26) were not returned. This sample size is considered adequate and in line with the

central limit theorem, which states that as the size of the sample approaches thirty, the distribution of that sample assumes a normal or symmetrical distribution of which generalisation of findings is possible (Datoegeom, 2006).

Table 4.1: Questionnaire Distribution and Response

Distribution	Small companies		Medium companies		Large companies		Total	%
	Prof	craftsmen	Prof.	craftsmen	Prof.	craftsmen		
Number administered	20	40	10	30	10	30	140	100
Number returned	10	35	5	29	8	27	114	81
Number unreturned	10	5	5	1	2	3	26	19

Source: Field Survey (2013)

Table 4.2: Designation / Trade of Respondents

Professionals			Craftsmen		
Professionals	frequency	Percentage	Tradesmen	frequency	Percentage
Builder	10	43	Mason	30	32
Architect	4	18	Carpenter	20	21
Civil engineer	7	30	Painter	14	16
Project manager	2	9	Plumber	16	18
			Iron bender	11	12
<b>Total</b>	<b>23</b>	<b>100</b>		<b>91</b>	<b>100</b>

Source: Field Survey (2013)

Table 4.3 shows the distribution of respondents' profession/trade. It shows that majority of the professionals are builders (43%), followed by civil engineers (30%), then Architects (18%) while (9%) are project managers. On the other hand, the distribution of the craftsmen shows that 32% are masons, 21% are carpenters, 18% are plumbers another 16% are painters while 12% are iron benders.

Table 4.3: Working Experience

Professionals			Craftsmen	
Years of experience	Frequency	Percentage	Frequency	Percentage
0-4 years	5	21	10	11
5-9 years	10	44	40	45
10-14 years	6	26	21	23
15 and above	2	9	20	21
<b>Total</b>	<b>23</b>	<b>100</b>	<b>91</b>	<b>100</b>

Source: Field Survey (2013)

Table 4.3 shows the general working experience of the respondents. Out of 23, professionals, 10, equivalent to 44% have 5-9 years experience, 26% have 10-14 years experience, and 9% have 15 years and above. Only 5 respondents (21%) have 0-4 year's experience. This shows that majority of the professionals have the required working experience to response to the questions.

Again, out of 93, craftsmen surveyed, 45% have 5-9 years experience, 23% have 10-14 experience, 21% have 15 years experience while 11% have less than 5 years experience while 11% have less than five years experience. This equally shows that majority of the craftsmen have the requisite working experience on constructions.

Table 4.4: Training unit or Department

Question	Option	Professionals			Craftsmen			%
		Small	Medium	Large	Small	Medium	Large	
Training unit or department	Yes	0	0	8	0	0	27	30
	No	10	5	0	35	29	0	70
Total								100

Source: Field Survey (2013)

Table 4.4 shows that 30% of the respondents indicate the existence of training units in their companies while 70% indicated none existence of training units or departments in their companies. This shows that majority of the small and medium construction companies do not have training units or departments.

Table 4.5: Engagement in Training Program

Question	Rating	Professionals			Craftsmen			%
		Small	medium	large	small	Medium	large	
Engaged in any training program	Yes	4	2	8	15	9	27	57
	No	6	3	0	20	20	0	43

<b>Total</b>	<b>100</b>
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Source: Field Survey (2013)

Table 4.5 shows that 57% of the respondents engage in training program while 43%, answered not being engaged in any training. This suggests that some construction companies engaged some of their employees for training (informally) through on-the-job training.

#### 4.2 Data Analysis

The questionnaire data analysis was carried out using simple statistical methods such as means, percentages and tables. Table 4.6 shows the respondents' ranking on the general craft skill training need as perceived by professionals that are directly involved in building productions and craftsmen within small, medium and large construction companies in the north western Nigeria.

Table 4.6: General Craft skill Training needs

S/N	General training needs	Professionals (N = 23)			Craftsmen (N = 91)			Average of mean score	
		Mean	Std. Dev	Rank	Mean	Std. dev	Rank	Mean	Overall Rank
1	Use of equipment safely and effectively	3.086	0.170	4	3.560	0.939	1	3.323	2
2	Understanding drawings and other written orders	3.347	0.281	1	3.483	0.210	3	3.415	1
3	Construction site safety	3.304	0.231	2	3.505	0.984	2	3.305	3
4	Selection and using materials and tools	3.130	0.320	3	3.395	0.128	5	3.262	4
5	Quality control	2.826	0.221	8	3.472	0.561	4	3.149	6
6	Waste control	3.040	0.222	5	3.362	0.289	6	3.201	5

7	Communication skills	2.478	0.330	12	3.324	0.187	9	2.901	10
8	Supervision	2.913	0.350	6	3.340	0.315	7	3.126	7
9	Selection and recruiting new intake	2.780	0.862	9	3.336	0.122	8	3.058	8
10	Computer appreciation	2.565	0.403	11	2.876	0.254	12	2.721	12
11	Leadership and motivation	2.826	0.320	7	2.978	0.145	10	2.902	9
12	Operation of heavy equipment such as crane and bulldozers	2.652	0.275	10	2.901	0.850	11	2.776	11

Source: Field Survey (2013)

Table 4.6 present the analysis of the general craft skill training need. Professionals and craftsmen were asked to rank the urgency to which training is needed as perceived by both groups (professionals and craftsmen). Professionals ranked understand drawings and other written orders with the highest mean of 3.347. This is followed by construction site safety with a mean of 3.304. The third rank training need is selection and using materials with a mean of 3.130. The lowest rank training areas are computer appreciation and communication skills with means of 2.562 and 2.478 respectively.

Similarly, the response of the craftsmen, (Table 4. 6) shows that used of equipment safely and effectively has been found to be the highest ranked general training needs with a mean of 3.560, followed by construction site safety with a mean of 3.505. This is followed by understanding drawings and other written orders with a mean of 3.483. The lowest ranked training areas are leadership and motivation, operation of heavy equipment such as crane and bulldozers.

The overall ranking of the general training need shows that understanding drawings , use of equipment safely and effectively and construction site safety were among the highest ranked training need from professionals and craftsmen opinion with ranked of

1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> and means of 3.415, 3.323 and 3.305 respectively. The implication is that professional bodies, sub-contractors and labour intermediaries (foremen) should be involved in craft skill training programmes if current skill shortages are to be overcome. Generalisation can thus be made that majority of the respondents (professionals and craftsmen) place more importance in the areas of understanding drawing, use of equipment safely and construction site safety were among the areas to which training is needed generally.

The lowest ranked training needs are communication training, operation of heavy equipment such as crane and bulldozer and computer appreciation with a mean of 2.978, 2.901 and 2.876 and ranked 10<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> respectively.

Table 4.7: Extent of Training needs of Craftsmen

S/N	Craftsmen	Professionals group (N=23)			Craftsmen group (N=91)			Average mean score	
		Mean	Std. Dev	Rank	Mean	Std. dev	Rank	Mean	Overall Rank
1	Mason	3.521	0.172	1	2.79 1	0.485	2	3.516	1
2	carpenter	2.521	0.153	5	2.68 1	0.236	4	2.601	5
3	painter	2.913	0.130	4	2.79 1	0.330	3	2.852	3
4	plumber	2.956	0.147	3	2.35 1	0.485	5	2.653	4
5	Iron bender	3.130	0.151	2	3.01 0	0.411	1	3.070	2

Source: Field Survey (2013)

Table 4.10 present the analysis of the extent of training for the selected craftsmen. Professionals and craftsmen were asked to rank the craftsman that urgently requires training. Professionals' ranked masons with the highest mean of 3.521, followed by iron benders with a mean of 3.130 and plumbers with mean of 2.956 and ranked 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup>. The lowest ranked craftsmen from the opinion of professionals are painters and carpenters with a mean of 2.913 and 2.521.

The response of the craftsmen (Table 7) shows that iron benders have a mean score of 3.010. This is followed by masons with a mean of 2.791 (SD 0.485) and painter with a mean of 2.791(SD 0.330) and ranked 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> accordingly. The lowest ranked craftsmen are carpenters and plumbers with mean of 2.681 and 2.351 respectively.

Yet, the overall rank of the extent of the training needs shows that masons, iron benders and painters with means of 3.516, 3.070 and 2.852 ranked 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> respectively were among the craftsmen that urgently require training. Reasons for the lack of training craftsmen can be attributed to the high cost of training and increasing use of labour-only subcontractors which has reduced the commitment and investment in training. The lowly ranked craftsmen are plumbers and carpenters.

**Table 4.8: Factors Militating against Crafts skill Training**

S/N	Militating factors	Professionals group (N=23)			Craftsmen group (N=91)			Average of mean score	
		Mean	Std. Dev	Rank	Mean	Std. dev	Rank	Mean	Over. Rank
1	High cost of training craftsmen	2.780	0.350	6	3.472	0.255	1	3.126	3
2	Insufficient number of craftsmen to be trained	2.869	0.340	2	3.340	0.194	3	3.104	4
3	Lack of adequate tools / equipment	3.043	0.377	1	3.336	0.188	6	3.189	2
4	Lack of assessing worker's training needs	2.826	0.506	3	3.336	0.202	5	3.308	1
5	Lack of adequate training facilitators	2.652	0.518	7	2.876	0.205	12	2.764	7

6	Size of the company	2.434	0.359	11	3.362	0.133	2	2.898	5
7	Level of education of trainers	2.130	0.350	24	2.450	0.187	24	2.290	27
8	Inexperience of craftsmen on the job	2.471	0.250	9	2.901	0.151	11	2.689	9
9	Interest of Professionals bodies on training (e.g. N.I.O.B. and N.S.E)	2.652	0.350	5	2.681	0.139	22	2.666	10
10	Adequacy of space to conduct the training	2.210	0.330	23	2.560	0.130	23	2.390	22
11	Accessibility of training location	2.120	0.189	27	2.725	0.194	17	2.422	21
12	Age of the craftsmen	2.278	0.250	17	2.791	0.282	15	2.534	16
13	Apathy on training	2.278	0.150	18	2.692	0.275	19	2.485	19
14	Training schedule conflicts with work schedule	2.340	0.492	13	2.670	0.257	13	2.505	18
15	Government policy on craft training	2.780	0.351	5	2.978	0.194	9	2.879	6
16	Poaching of craft workers by construction companies	2.340	0.556	12	2.791	0.217	16	2.565	14
17	Adequacy of qualified training institutions	2.265	0.350	19	2.978	0.255	8	2.621	12
18	Frequency / unstable level of construction activities	2.265	0.320	20	2.450	0.125	25	2.357	23
19	Language barrier	2.780	0.518	4	2.348	0.185	26	2.356	24
20	Mobility of craftsmen	2.260	0.340	21	2.341	0.228	27	2.300	26
21	Effective regulatory body for craftsmen in the industry	2.340	0.434	14	2.692	0.206	20	2.516	17
22	Lack of private sector investment in training	2.130	0.221	25	2.791	0.522	14	2.460	20
23	Low satisfaction of training programs offered at craft schools	2.120	0.350	26	2.681	0.300	21	2.400	25
24	Training levies	2.340	0.359	15	2.901	0.201	10	2.620	13
25	Poor pay/ wages	2.278	0.358	16	2.978	0.250	7	2.628	11
26	Unionism	2.210	0.754	22	3.336	0.550	4	2.773	8
27	Employment of migrant workers	2.434	0.434	10	2.692	0.287	18	2.503	15

Source: Field Survey (2013)

Table 4.14 shows perception of professionals the ranking of factors militating against craft skill training as perceived by professionals and craftsmen. The result demonstrates that lack of adequate tools / equipment was rank 1st by the professionals with a mean of 3.043. Followed by insufficient number of craftsmen to be trained was ranked 2<sup>nd</sup> with a mean of 2.869. This is followed by lack of assessing worker's training needs prior to training program was ranked 3<sup>rd</sup> with a mean of 2.826. The lowest ranked factors are

low satisfaction of training programs offered at craft school and accessibility of training location with a mean of 2.130, 2.120 and 2.120 respectively.

Response of the craftsmen revealed that high cost of training craftsmen, was ranked 1<sup>st</sup> with a mean of 3.472. This is followed by size of the company was ranked 2<sup>nd</sup> with a mean of 3.362, and then insufficient number of craftsmen to be trained was ranked 3<sup>rd</sup> with a mean of 3.340. The lowest rank factors from the opinion of craftsmen are language barrier and mobility of craftsmen.

Still, the average militating factors from the groups revealed that are lack of assessing worker's training needs prior to training program was ranked 1<sup>st</sup> with a 3.308. This agrees with the findings of Muya, et al. (2003) that appropriate training can only be developed if training needs are carefully identified. The implication is that for any training to be successful and effective the training needs of the trainers must identify in order to avoid miss match between training need and workforce training offered. Therefore, training is more useful when it is design to address a specific problem.

This is followed by lack of adequate tools / equipment was ranked 2<sup>nd</sup> with a mean of 3.189. This agrees with the findings of Henry *et al.* (2007) that lack of tools and equipment are among the major factors affect craftsmen productivity. The implication is that tools are mainly provided to the craftsmen engaged on full time basis. Casual workers are expected to bring their own partly because these workers end up taking the very tools they are provided with. Some equipment is not readily available in some places even for hiring. There is a need to improve the availability of tools during training programs to make workers more productive.

The third rank factor is high cost of training craftsmen with a mean of 3.126. This coincides with findings of Muya, et al., (2005) that lack of sustainable sources of finance appears to be the major obstacle to training efforts for the construction craft

workforce worldwide. This suggest that fees for the training programs are normally expensive with their little income craftsmen almost find it difficult to join training programs and there is no support from the government, contractors and construction industry in conducting training for craftsmen. The lowest ranked factors are mobility of craftsmen and level of education of trainers.

Table 4.9: Crafts skill Training Areas

S/N	Training Areas	Professionals group (N=23)			Craftsmen group (N=91)			Average of mean score	
		Mean	Std. Dev	Rank	Mean	Std. dev	Rank	Mean	Overall Rank
1	Basic safety	3.086	0.315	7	3.483	0.499	3	3.284	2
2	Fall protection	2.826	0.222	16	3.362	0.287	8	3.094	7
3	Scaffolding	2.826	0.289	15	2.670	0.221	17	2.748	17
4	Working at elevation	2.478	0.237	24	2.604	0.330	29	2.541	27
5	Confine space entry	2.210	0.251	30	2.626	0.309	28	2.418	31
6	Protective equipment	2.434	0.289	25	3.395	0.593	5	2.914	9
7	Common job site hazards	2.086	0.310	32	2.692	0.593	16	2.389	33
8	Hand tools utilization	3.130	0.318	5	2.681	0.593	18	2.906	11
9	Saws	1.869	0.186	35	3.241	0.419	10	2.555	26
10	Hammers	2.210	0.259	20	3.472	0.567	4	2.841	13

11	Levels	3.043	0.317	9	2.681	0.330	21	2.862	12
12	Pulleys	3.130	0.317	6	2.681	0.309	22	2.905	10
13	Clamps	3.086	0.194	8	2.560	0.492	30	2.823	14
14	Powered hand tools utilization	2.826	0.550	14	2.681	0.493	16	2.753	16
15	Drilling machines	2.869	0.268	13	3.362	0.419	7	3.115	6
16	Electric saws	2.652	0.838	12	2.725	0.567	15	2.688	20
17	Grinders	1.869	0.255	34	3.340	0.330	9	2.604	21
18	sanders	2.260	0.248	19	2.791	0.419	14	2.525	28
19	Understanding drawings	3.304	0.289	3	3.505	0.629	2	3.304	1
20	Building drawings	2.956	0.255	10	3.362	0.628	6	3.159	4
21	Civil or structural	2.340	0.317	26	2.681	0.464	20	2.510	29
22	Mechanical	2.260	0.222	29	2.472	0.359	32	2.366	34
23	Plumbing	2.652	0.216	21	2.472	0.170	33	2.562	24
24	Electrical	2.652	0.194	22	2.472	0.377	31	2.561	25
25	Multi skilling	2.780	0.255	18	3.560	0.309	1	3.170	3
26	Waste control	2.130	0.289	31	2.681	0.684	17	2.405	32
27	Quality control	2.913	0.130	11	2.285	0.305	35	2.599	22
28	Communication skills	2.780	0.289	17	2.681	0.250	23	2.730	18
29	Technical / on the job training	3.304	0.252	4	2.978	0.298	11	3.141	5
30	New construction methods	3.304	0.317	2	2.681	0.150	25	2.992	8
31	Management of unskilled labour	1.956	0.255	33	2.670	0.320	27	2.313	35
31	Time management	2.565	0.289	23	2.846	0.330	13	2.705	19
33	Human relations	3.347	0.890	1	2.285	0.550	34	2.816	15
34	Managing change/ rework	2.260	0.249	27	2.681	0.221	24	2.470	30
35	Creativity	2.260	0.248	28	2.901	0.427	12	2.580	23

Source: Field Survey (2013)

Table 4.18 shows professionals and craftsmen ranking of specific craftsmen training areas. Respondents were asked to rank the level of priority on each training area based on their experience. Professionals ranked human relations they view this area as the most important training area. This factor was ranked 1<sup>st</sup> with a mean of 3.347. New construction methods were ranked 2<sup>nd</sup> with a mean 3.304 and (SD, 0.317). Understanding drawings was ranked 3<sup>rd</sup> with a mean of and 3.304 (SD, 0.289). The lowest training areas are management of unskilled labour and use of grinders and saws. Craftsmen ranked multi skilling 1<sup>st</sup> with a mean of 3.560, followed by understanding drawings with a mean of 3.505. This is followed by basic safety with a ranked of 3<sup>rd</sup> and

mean of 3.830. The lowest training areas are human relations and quality control respectively.

The overall mean of the respondents shows that understanding drawing was ranked 1<sup>st</sup> with a mean of 3.304. This suggest that training is more useful when its design to addressed a specific problem. Basic safety was ranked 2<sup>nd</sup> with a mean of 3.284. This found that majority of accidents are not caused by careless workers but by failure in control, which ultimately is the responsibility of management to conduct safety training for employees. Therefore, clearly shows that safety should be considered being equally as important as production. Multi skilling was ranked 3<sup>rd</sup> with a mean of 3.170. This agrees with the assertion of Dada and Ekpe, (2006) that lack of training hampers the utilization of multi skilling. Also with the assertion of CII, (1998) that workers are trained to perform multiple tasks which guarantees steady employment through many phases of a projects thus resulting in less time spent unemployed. This suggests that specialized workers will have deeper knowledge of a given task and will be more productive in accomplishing a complex task than will multi skilled workers.

The lowest ranked training areas area mechanical drawings and management of unskilled labour. This concludes that craftsmen prefer instruction in areas of understanding drawings, basic safety and multi skilling.

Table 4.10: Training Methods

S/ N	Training methods	Professionals group (N=23)			Craftsmen group (N=91)			Average mean score	
		Mean	Std. Dev	Rank	Mean	Std. dev	Ran k	Mean	Overall Rank
1	Induction training	2.478	0.450	6	2.901	0.525	5	2.689	5
2	Apprenticeship training	3.086	0.108	2	3.010	0.377	4	3.048	1
3	Formal education and training	2.608	0.151	5	3.010	0.753	3	2.809	4
4	Practical demonstrations	2.652	0.130	4	3.340	0.170	2	2.996	3
5	On the job training	2.652	0.255	3	3.384	0.330	1	3.018	2
6	Conference/ workshops/	3.173	0.282	1	1.362	0.434	6	2.267	6

Table 4.22 presents the analysis of the training methods for the selected craftsmen as shown by the group (professionals and craftsmen). Professionals ranked conference/workshops/ seminars 1<sup>st</sup> with a mean of 3.173 as the most effective training methods for craftsmen on the job. Apprenticeship training was ranked 2<sup>nd</sup> with a mean of 3.086. On the job training was ranked 3<sup>rd</sup> with a mean of 2.652 and (SD, 0.265). The lowest training areas based on the opinion of professionals are formal education and induction training.

The response of the craftsmen shows that on the job training, practical demonstrations and formal education were ranked 1<sup>st</sup> 2<sup>nd</sup> and 3<sup>rd</sup> respectively. The mean for the training methods are 3.348, 3.340 and 3.010 accordingly. The lowest rank training methods are conference and seminars.

Then, the average mean of the respondents shows that apprenticeship training was ranked 1<sup>st</sup> with a mean 3.304. Followed by practical demonstration was ranked 2<sup>nd</sup> with a mean of 3.018. This may be due to the fact that most of the construction materials manufacturers introducing their new products to the industry through practical demonstration. The third rank factor is on the job training with a mean of 2.996 and ranked 3<sup>rd</sup>. Thus, this finding gave credence to that of Abdullah, (2010) that contractor's employees prefer on-the-job training among the suitable craftsmen training methods. The lowest training methods are formal training, induction training and conferences.

It is worth nothing that for any two groups to have different opinions on the importance given to each of craft skill training needs. This is expected since they have different professional background or trade, attended different training institutions, belongs to different training generations, have different working experience and different classes of

companies. For instance, item 25 in table 8 (factors militating against craft skill training) poor pay/ wages is ranked 16<sup>th</sup> by the professionals (which may mean fairly important), but the same item is ranked 7<sup>th</sup> by the craftsmen which may mean (important) this shows that craftsmen place more important on matters that will increase their wages. Again item 1 in table 8 high cost of training craftsmen is rank 6<sup>th</sup> by the professionals and 1<sup>st</sup> by the craftsmen. This is not surprising because high training cost implies more expenses for the organization. Therefore management will be more interested in matters that have financial implication like training than the artisans. This concludes that respondents (professionals and craft skill) experience, nature of the job handle, age of the craftsmen were among the factors that affect the craft skill training needs in the north western Nigeria.

## **CHAPTER FIVE**

### **5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Summary**

A review of literature revealed that the purpose of a training needs assessment is to identify performance requirements within an organization in order to help direct resources to the areas of greatest need, improved training programs and providing quality craftsmen. The study assesses professionals and craft skills perception on craft skill informal training needs in the Nigerian construction industry from highlights of the major findings are as follows:

- i. frequency of training is low among craftsmen.

- ii. That there was lack of training department in the small and medium construction companies as indicated by craftsmen (30%) and Professionals (70%) describing the non existence of training units or departments.
- iii. Majority of the respondents (80%) indicates the level of training of an average craftsman was inadequate. No agencies was found regulating the activities of construction craftsmen on site.
- iv. Both professionals and craftsmen indicated areas in which training is needed generally are understanding drawings and construction site safety among the general craft skill training needs to which training is required generally.
- v. There is consensus of opinion among both professionals' and craftsmen specific craft skill training areas which include understanding drawings, basic safety on site and multi skilling.
- vi. Respondents indicate that masons, iron benders and painters were among the craftsmen that are highly required training in the north western Nigeria.
- vii. Both the respondents consider lack of assessing worker's training needs prior to training program, lack of adequate training facilitators and high cost of training craftsmen among the major factors militating against craft skill training.
- viii. Respondent's perceived traditional apprenticeship training and on the job training among the effective training methods for training craftsmen.
- ix. Craft skill training need can be assesses from professionals that are directly involved in building production and from the craftsmen who work on site regularly.

## 5.2

## Conclusion

It is clear from the survey findings that the small and medium construction companies engaged some of their staff for training on the job and there was lack of training unit or department in the companies. Assessment of craft skill training need is an important strategy through which construction companies identified and respond to craft skill training areas in their respective companies. It can therefore, be conclude that Understanding drawings, basic safety on site and multi skilling were among the specific craft skills training areas. The research also concluded that lack of assessing worker's training needs prior to training program and lack of adequate training facilitators were among the factors militating against craft skill training. The research further concluded that apprenticeship and on the job training was among the effective craft skill training methods. This suggest that providing training for craftsmen will improve employees morale, skills, ability and hence their training programs.

### **5.3**

### **Recommendations**

- i. Government which is a major client to the Nigeria construction industry and construction companies (small and medium) should invest more on the training of craftsmen. Master craftsman (foreman) should be encouraged and supported to train craftsmen on site in order to improve their training programmes and decrease their injuries rates and also to put an end to the problem of skill shortages.
- ii. In order to cope with the complex nature of construction site works, construction companies small and medium craft skills' training areas should address understanding drawings (buildings, civil, mechanical

plumbing and electrical), basic safety onsite and multi skilling in order to solve the problem of skill shortage.

- iii. Frequent training of craftsmen should be seen as important strategy. Government in collaboration with professional Regulatory bodies such as The Council of Registered Builders of Nigeria (CORBON) and (NIOB) should make policies that will regulate craft skill training in the construction industry.
- iv. Construction companies should encourage the use of traditional apprenticeship and on-the-job training among the effective training methods for craftsmen in the north western Nigeria.
- v. Due to wide-spread acceptance of traditional apprenticeship and on the job training in the construction industry, it is recommended that a construction industry certification scheme be introduced to provide a unified basis for standardizing training and certifying the competencies of all craftsmen irrespective of their initial training background.
- vi. In the absence of a strong national training system for craftsmen a sector training fund should be introduced, contractors should be allowed to include training fees in their tender sum for training craftsmen in the construction industry.

### **5.3.1 Research Contributions**

This research contributes to the construction research in the following regards

1. This research identified craft skill training areas in the construction industry.
2. This research identified effective craft skill training methods in the construction industry.

3. This research documented the sources of information in assessing craft skill training needs in order to avoid miss-match between training offered and workforce training need.

### **5.2.1 Recommendations for Further Research**

This research made the following recommendation for the future research efforts to focus on:

1. Further research should be carried out to assess craftsmen training needs from other geo-political zones in the country.
2. More research should be used to measure the effect of training on productivity of craftsmen.

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**Appendix 1 sample of questionnaire**  
 DEPARTMENT OF BUILDING  
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**Section One**

**RESPONDENT’S INFORMATION**

1. Indicate your activity in the construction industry  
 (a) Professional [ ] (b) craftsman [ ]
2. If professional, indicate the size of your firm /company based on category of registration with Federal Ministry of Works  
 (a) Small (Number of employees: 1- 49) [ ]  
 (b) Medium (Number of employees: 50 – 99) [ ]  
 (c) Large (Number of employees: >100) [ ]
3. What is your Profession or discipline in the construction industry?  
 (a) Building [ ] (b) Civil engineering [ ] (c) Architecture [ ] (d) Project management [ ]

4. If professional, indicate the craft skill you supervise in the construction company  
 (a) Mason [ ] (b) Carpenter [ ] (c) Painter [ ] (d) Plumber [ ] (e) Iron bender [ ] Tiler [ ]

Others (specify).....

5. If craftsman, indicate your craft skill

- (a) Mason [ ] (b) Carpenter [ ] (c) Painter [ ] (d) Iron bender [ ] Plumber (e) Tiler [ ]

Others (specify).....

6. How long have you been in the construction industry?

- (a) 0 – 4 years [ ] (b) 5 – 9 years [ ] (c) 10 – 14 years [ ] (d) 15 years and above [ ]

### Section two

#### GENERAL CRAFT SKILL TRAINING NEEDS IN THE NIGERIAN CONSTRUCTION INDUSTRY1.

1. Do you have training unit or department in your company? Yes [ ] No [ ]  
 2. Have you ever been engaged in any training program? Yes [ ] No [ ]  
 3. The following have been identified as the general crafts skill training needs in the Nigerian construction industry. Indicate extent to which training is needed on scale 1- 4 where: **1= Not important, 2 = fairly important, 3 = important, 4 = very important.**

SN	GENERAL TRAINING NEEDS	DEGREE OF IMPORTANCE			
		1	2	3	4
1	Using equipment safely and effectively				
2	Understanding drawings and other written orders				
3	Construction site safety				
4	Selecting and using materials and tools				
5	Quality control				
6	Waste control				
7	Communication training				
8	Supervision				
9	Selecting and recruiting new intake				
10	Computer operation				
11	Leadership and motivation				
12	Operation of heavy equipment such as Cranes, bulldozers				

### Section three

#### EXTENT OF TRAINING NEEDS

#### OF CRAFTSMEN IN THE NIGERIAN CONSTRUCTION INDUSTRY.

1. The following are some of the widely used craftsmen in building construction. Rank each in your own opinion on scale 1-4 based on degree of their training needs.

Where, 1= Not severe, 2= fairly

Severe, 3= Severe, 4= Very severe.

S/N	CRAFTSMEN	Degree of severity

		1	2	3	4
1	Mason /bricklayer				
2	Carpenter				
3	Painter				
4	Plumber				
5	Iron bender				

#### Section four

### FACTORS MILITATING AGAINST CRAFTS SKILL TRAINING IN THE NIGERIAN CONSTRUCTION INDUSTRY.

1. Below are some of the major factors militating against crafts skill training in the Nigerian construction industry? Please rank these factors on a scale 1- 4 according to their level of impact on the training where: **1= None, 2= Slight, 3= Moderate, 4=Severe.**

SN	MILITATING FACTORS	LEVEL OF THE IMPACT			
		1	2	3	4
1	High cost of training craftsmen				
2	Insufficient number of craftsmen to be trained				
3	Lack of adequate tools / equipment				
4	Lack of assessing worker's training needs prior to training program				
5	Lack of adequate training facilitators				
6	Size of the company				
7	Level of education of trainers				
8	Inexperience of craftsmen on the job				
9	Interest of Professionals bodies on training (e.g. N.I.O.B. and N.S.E)				
10	Adequacy of space to conduct the training				
11	Accessibility of training location				
12	Age of the craftsmen				
13	Apathy on training				
14	Training schedule conflicts with work schedule				
15	Government policy on craft training				
16	Poaching of craft workers by construction companies				
17	Adequacy of qualified training institutions				
18	Frequency / unstable level of construction activities				
19	Language barrier				
20	Mobility of craftsmen				
21	Effective regulatory body for craftsmen in the industry				
22	Lack of private sector investment in training				
23	Low satisfaction of training programs offered at craft schools				
24	Training levies				
25	Poor pay/ wages				
26	Unionism				
27	Employment of migrant workers in the construction companies				

**Section five**  
**SPECIFIC CRAFT SKILLS TRAINING NEEDS IN THE NIGERIAN**  
**CONSTRUCTION INDUSTRY.**

1. Have your training needs been assessed before engaging in training program. Yes [ ]  
 No [ ]
2. Below are some of the training areas (mentioned in section three) for craftsmen in the Nigerian construction industry. Rank the level of priority do you thing each of this training areas should be given of 1-4 where **1=Not urgent, 2= fairly urgent, 3= urgent, 4= very urgent.**

SN	AREAS OF TRAININ	LEVEL OF URGENCY			
		1	2	3	4
<b>1</b>	<b>Basic safety</b>				
<b>1.1</b>	Fall protection				
<b>1.2</b>	Scaffolding				
<b>1.3</b>	Working at elevation				
<b>1.4</b>	Confine space entry				
<b>1.5</b>	Protective equipment				
<b>1.6</b>	Common job site hazards				
<b>2</b>	<b>Hand tools utilization</b>				
<b>2.1</b>	Saws				
<b>2.2</b>	Hammers				
<b>2.3</b>	Levels				
<b>2.4</b>	Pulleys				
<b>2.5</b>	Clamps				
<b>3</b>	<b>Powered hand tools utilization</b>				
<b>3.1</b>	Drilling machines				
<b>3.2</b>	Electric saws				
<b>3.3</b>	Grinders				
<b>3.4</b>	Sanders				
<b>4</b>	<b>Understanding drawings</b>				
<b>4.1</b>	Building or architectural				
<b>4.2</b>	Civil or structural				
<b>4.3</b>	Mechanical				
<b>4.4</b>	Plumbing				
<b>4.5</b>	Electrical				
<b>5</b>	Multi skilling				
<b>6</b>	Waste control				
<b>7</b>	Quality control				
<b>8</b>	Communication skills				
<b>9</b>	Technical / on the job training				
<b>10</b>	New construction methods				
<b>11</b>	Management of unskilled labour				
<b>12</b>	Time management				
<b>13</b>	Human relations				

<b>14</b>	Managing change/ rework				
<b>15</b>	Creativity				

**Section six**

**CRAFT SKILL TRAINING METHODS.**

**1.** How would you describe the level of training of an average Nigerian craftsman?  
 (a). In adequate [ ] (b). Very adequate [ ] (c). Fairly adequate [ ] (d). Adequate [ ]

**2.** Rank these factors on their level of effectiveness to the training where: **1= Not effective, 2= fairly effective, 3= effective, 4= very effective**

SN	TRAINNG METHODS	LEVEL OF EFFECTIVENESS			
		1	2	3	4
<b>1</b>	On the job training				
<b>2</b>	Traditional Apprenticeship training				
<b>3</b>	Formal education and training				
<b>4</b>	Induction training				
<b>5</b>	Practical demonstrations				
<b>6</b>	Conference/ workshops/ seminars				