AN ASSESSMENT OF MULTI-SKILLING IN ADDRESSING SKILLS SHORTAGE IN NIGERIAN CONSTRUCTION FIRMS

BY

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Declaration

I declare that the work in this dissertation entitled “An assessment of multi-skilling in addressing skills shortage in Nigerian construction firms” has been carried out by me in the Department of Building. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma in this or any other institution.

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Certification

This dissertation entitled" An assessment of multi-skilling in addressing skills shortage in Nigerian construction firms" by Etubi, Ukwumonun meets the regulations governing the award of the degree of Master of Science of construction management of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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Dedication

This dissertation is dedicated to my wife, Etubi Ajuma Josephine and children Ojonugwa, Omaojo and Ojima for their support for this study.

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Abstract

The construction industry in Nigeria is largely driven by activities of skilled labour or craftsmen as most of the construction activities are carried out manually. However, the Nigerian building construction firms are challenged by shortage of skilled manpower. This study assessed multi-skilling practice in building construction with a view to bridge skills shortage in the building construction firms. This study identified specific skills shortage and responsible factors, assessed the practice of multi-skilling, identified the impact of multi-skilling, identified impediments and ways of enhancing multi-skilling in the building construction firms. The study utilized a population of 170 building construction firms registered in Abuja with updated remittance to the Industrial Training Fund (ITF). Simple random sampling was used in selecting 140 sampled firms. Two sets of questionnaires were administered to the most senior professional and craftsman in each of the 140 firms sampled. Data obtained was analysed with statistical tools: Mean, Percentage, and standard deviation and results were presented in charts and tables. The major findings in this study revealed that respondents (professionals and craftsmen) admitted shortage of Masonry/Bricklaying, Plumbing, and Painting skills. Poor Apprenticeship Schemes was unanimously agreed by respondents to be the most important factor responsible for skills shortage in building construction firms. The study also revealed that multi-skilling is not well practiced among the professionals while most of the craftsmen possess and practice skills other than their traditional area of competence. The study showed that professionals and craftsmen admitted that Work Force Saving is the most important impact of multi-skilling. Findings on impediments to multi-skilling revealed that High cost of training and Complexity of management are the major impediments. Training and Retraining of workers and Management's decision to multi-skill were ranked highest as ways of

enhancing the practice of multi-skilling. The research therefore concludes that Workforce Saving attribute of the concept of multi-skilling can reduce skills shortage in building construction firms. Therefore, the study recommends that construction firms should adopt multi-skilling with sustainable implementation strategies in order to bridge skills shortage.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

The Building and construction sector and construction activities are considered to be the major sources of economic growth, development and economic activities of a nation (Raza, 2008). According to Oseghale, Abiola and Oseghale (2015), the building and construction sector is an essential contribution to the process of development. The role of the sector is very important because of its output due to achievement of socio-economic objectives such as shelter, infrastructure and employment opportunities (Usman, Inuwa, Iro&Dantong. 2012). The building and construction sector has been closely linked to the economy of a country and is often a good indicator of the state of an economy (James, Rust &Kingma, 2012). According to Isa, Jimoh and Achuenu (2013), the sector's size, nature of its operation, its job creation potentials and its presence in every developmental activity have made construction an attractive area for experimentation in enhancing the effectiveness of governance and cooperative works towards sustainable economic development. According to Yunusa (2015) there are no developed countries of the world that had not invested fortunes to strengthen the construction industry both for the process of the nation's development and maintenance of development. Yunusa (2015) also asserted that in the developing and underdeveloped countries, great awareness and interest is shown in boosting the capacity of their construction sectors in order to seamlessly drive development.

The building and construction industry in Nigeria, according to Idoro (2011), occupies a significant position and plays a major role in economic development. The building

construction firms in Nigeria have over the years maintained their place as the engines that drive the construction industry. They do this through the use of the available skilled manpower for the execution of infrastructural projects within the economy (Duben, Stephen, Oluwaseyi&Onuwa 2012).

The Building construction firms in Nigeria are mainly driven by activities of skilled labour or craftsmen because most of the construction activities are carried out manually (Ayegba& Edwin, 2014). According to Odunsami, Oyediran and Oseni, (2007) 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 personnel. This is also supported by Yakubu (2003) that the building construction firms in Nigeria is built on the foundation of skilled craft workers who are primarily supplied through various sources such as craft training institutions, vocational or technical colleges, on job training and apprenticeship. The place of the skilled worker in the construction industry cannot be over emphasized (Areh, 2003). This is evident in the efforts shown by government and industry stake holders at all levels in trying to boost construction skills supply. The government of Nigeria, amongst other numerous efforts, through the Federal executive council, on April, 10th 2013, approved the National Vocational Qualification for skilled artisans to also include those of the construction industry in their bid to encourage people to enrol for skill training (Fred, 2015). This is to assure craftsmen and intended craftsmen of a good career path thereby eliminating uncertainties surrounding the future of the Nigerian craftsmen.

However, one of the major hindrances to global and local construction process has been the inadequate supply of labour or craft to drive the industry task. Bruce and Dulipovici

(2001) defined skills shortage as the difficulty in finding the right people to fill the available job. Darren, Mark and Christopher (2012), considered skill shortage to occur when the demands for workers for a particular occupation is greater than the supply of personnel who are qualified, available and willing to work under existing market conditions, and if the supply is greater than demand then there is a surplus. The Chartered Institute of Building (2008) observes that every sector of the construction industry is experiencing some labour shortage. About 40 percent of respondents to various surveys indicated that they have experienced some labour shortage in the recent past (Construction Owners Association of Alberta, 2005; McCausland 2006), cited in Awe, Stephenson and Griffith, (2009).

According to Ibrahim (2010) skills shortage had hampered the industry's capacity to deliver maximally for the benefit of the Nigerian economy. According to Medugu, Majid, Bustani, Bala, Abdulahi&Mbamali (2011), skilled labour shortage impact different areas of construction activities and impact on time, cost and quality of work and that this may also endanger the achievement of financial prosperity for which such projects are conceived.

One of the ways to address the situation might be to strategically deploy the multi-skilling approach (Ejohwomu, 2007. A multi-skilled construction trade worker is an individual who possesses or acquires a range of skills and knowledge and applies them to work tasks that may fall outside the traditional boundaries of his or her original trade (Dada & Ekpe, 2006). This implies that multi-skilling might reduce the quantity of skilled workers needed as a multi-skilled worker can work outside his traditional competence. The potential for multi-skilling in the construction industry is an aspect of cost reduction benefit that has been poorly utilized (Ejohwomu, 2007.

1.2 Statement of Research Problem

According to Bustani (2011), the quality and availability of skilled workforce is considered an important factor towards the effectiveness of the construction sector. Medugu, Majid, Bustani, Bala, Abdullahi &Mbamali, (2011) opined that where highly capable personnel is utilized, the impact of skilled craftsmen in the industry is very visible in its ends products

In Nigeria, past Studies have shown shortage of skills in every part of the country. Sanni& Alabi (2008) asserted that availability of adequate skilled workforce in the construction industry has for long been identified as being in short supply. According to Ibrahim (2010), one of the major problems facing the Nigerian construction industry is the lack of qualified craftsmen. Sanni& Alabi (2008) documented that shortages of craftsmen have already been experienced in many urban areas in Nigeria where massive unemployment or underemployment is accompanied by scarcity of brick or block layers, carpenters, plasterers, plumbers and other trades in the building industry. Sanni& Alabi (2008) also said this is evident in the fact that most skilled workers in the country are migrants from neighboring West African countries like Ghana, Benin republic and Togo. Odunsami&Unoma (2011) opined that over time, the stock of competent skilled construction workers has dwindled and the industry which is expected to be the highest employer of labour after agriculture is populated with largely unskilled, inefficient and dissatisfied workers who see work in the industry as a stop-gap till "better things in the future." Few see their crafts as careers worth investing in.

It is obvious from the above that shortage of skills in the construction industry is a

serious challenge stampeding the quality of projects delivered by the industry. According to Oseghale, Abiola-Falemu and Oseghale (2015), skills shortages are a complex labour market Phenomenon, and are related to business performance. Oseghale, *et al*, (2015) went further to state that skills shortages are often portrayed as a major problem for the economies of many countries. This in turn leads to poor workmanship, low productivity, late completion, cost over overruns and high accident rates (Dantong, 2006). Generally, the effect of the imbalance in skills demand and supply is poor project delivery, loss of client's confidence in building contractors and certainly, dis-investment in the construction industry (Ify, Onome& Terry 2016).

More worrisome is the poor outcome of several strategies from construction industry operators in addressing the problem. Industry managers are daunted with efforts at trying to find compromise between this staggering skills shortage and the increasing construction process.(Ejohwomu, 2007). Past researches such as Odunsami&Unoma (2011) and Oseghale*et al.* (2015) tend to focus on identifying causes of skills shortages and proffering solutions such as those that would improve and encourage skills acquisition, better pay and security for craftsmen, creation of career path and training for craftsmen, without consideration for maximal utilization of existing skills. Unfortunately, the menace of skills shortages still stares the construction industry on the face. (Ejohwomu, 2007).

This persistent shortage of skills in the industry suggests that most of the skills supply and maintenance strategies adopted are either poor or not sustainable. Most studies in this area have focused on increasing the population of the existing pool of skills rather than harnessing existing ones (Ejohwomu, 2007).

This study therefore is an assessment of multi-skilling practice in building construction with a view to ameliorate skill shortage in building construction firms. This study considers the need to explore the impact of multi-skilling or harnessing the maximum potentials of existing workforce as a panacea to skills shortage in the construction industry.

1.3 Justification of the Study

According to Ejohwomu, (2007), several past efforts in research directed at tackling skills shortage in the building construction industry had failed. (Ejohwomu, 2007). A study like this that aims at assessing the practice of multi-skilling with the view to ameliorating gap between skills supply and demand is of significance. Most strategies are targeted at improving skills training, motivation for skilled workers, and improving governmental policies on skills supply, while little has been done in developing strategies for efficient management and utilization of existing skills by way of multi-skilling workforce in the building construction. According to Brown (2011), the declining number of entrants into construction crafts presents critical challenges for our industry today. One solution which may positively affect many labour issues is to better utilize the skilled workers currently in the industry through the development and use of multi-skilling. The concept of multi-skilling would allow for maximum utilization of competencies of exiting stock of skilled workers and ultimately reduce skills demanded and save cost of skills (Ejohwomu, 2007). According to Keiber, Riley & Jones (2000) there could be a 5-20% labour cost saving, a 35% reduction in required workforce, a 47% increase in average employment duration and

an increase in earning potential for the multi-skilled construction worker if the concept of multi-skilling is applied to the construction industry.

Unfortunately, not much research has been done with the view to addressing skills shortage through multi-skilling. In Dada &Epke (2006), attention was given to identifying the benefits of multi-skilling for the construction workers. While in Ify, *et al*. (2016), study was basically to know the problems associated with the utilization of skilled workers sub craft. It is justifiable here, to assess multi-skilling in the construction firms with particular interest in identifying its effect in addressing skills shortage in the construction firms. Hence, An assessment of multi-skilling in addressing skills shortage in Nigerian construction firms.

It is expected that the study will contribute to strategies aimed at reducing skills shortage by maximally utilizing available pool of workers. The study will enlighten construction managers on the benefits and ways of implementing a multi-skilled workforce.

1.4 Aim and Objectives

1.4.1 Aim

The aim of the study is to assess the practice of multi-skilling in building construction with a view to ameliorate skills shortage in the Nigerian building construction firms.

1.4.2 Objectives

The aim of the study was achieved through the following objectives, to;

i. Identify the specific skills shortage in building construction firms.
ii. Assess the level of practice of multi-skilling in building construction firms.
iii. Assess the effect of multi-skilling in the building construction firms.

iv. Identify impediments to multi-skilling in the building construction firms.

v. Identify ways of enhancing practice of multi-skilling in building construction firms.

1.5 Scope and Limitations

1.5.1 Scope

This research focused on the building construction firms in Abuja. This is because of the high volume of building construction activities in Abuja.

The research focused on the survey of masonry/bricklaying, carpentry, plumbing, iron fixing and painting skills. These trades were considered for survey because Umar (2014) asserted that they are most common and available in every building construction activity in Nigeria. Similarly, Oseghale *et al*. (2015) described them as most dominant and popular in the building construction firms. The response was limited to that of professionals and craftsmen in building contruction firms in Abuja.

1.5.2 Limitations

There may be some possible limitations in this study which could be as a result of the following:

i. Rejection of questionnaires by management of some sampled firms. Some firms do not allow their workers to respond to questionnaires. They assumed company's personal information might be divulged while some could not simply allow time for that.

ii. This study acknowledges limitations that could be imposed as a result of low level of literacy of some craftsmen.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Construction Industry Skills

A skill is an ability to perform a productive task at certain level of competence (Ade, Musibau, Habila& Anthony, 2015). Construction skills are one of the major resource inputs into construction activity Medugu, Majid, Bustani, Bala, Abdullahi and Mbamali, (2011) opined that where highly capable personnel is utilized, the impact of skilled craftsmen in the industry is very visible in its ends products. This is because they are directly involved in speedy realization of construction projects delivery since they are involved in the technical aspect of such contract (Medugu et al, 2011) However, where qualified skilled craftsmen are involved, it tends to eliminate the concern of poor quality, low productivity, late project completion which often result to conflicts, cost and time overruns (Darren, Mark & Christopher,2012) The availability of skilled labour is considered as one of the most critical factors for the effectiveness of the construction industry (Bustani, 2000).

The construction industry, despite the rapid technological innovations in construction, still remains a hub of skills. The complex nature of its activities can only be achieved by ready, willing, competent skilled force (Darren et al., 2012). The skills and competencies considered in this study include the mason nary/bricklaying, carpentry, plumbing, iron fixing and the painting skills.

2.1.1 Masonry/Bricklaying

Masonry/bricklaying is a principal craftsmanship in the building construction industry. The person who does masonry/bricklaying is known as a mason/bricklayer. Masons/ Bricklayers are engaged in building and renovating houses, offices, and industrial complexes using bricks, blocks, and mortar (Lawal & Kolawole, 2004).

According to Areh (2003), the mason makes use of bricks, concrete blocks, stone, tiles and other materials to construct or repair walls, foundations and other structures. Areh (2003), also said that the mason is also responsible for preparing surfaces to be covered and mixing materials like mortar or cement. Preparatory work such as caulking and cleaning and placing damp proofing and masonry flashing is also done by a Mason.

2.1.2 Carpentry

Carpentry is about wood work. A craftsperson killed in carpentry is called a carpenter and the person might be adept at only one or several types of woodworking skills (Zakari, 2012). There are several categories of carpentry, each involving a different skill set. A rough carpenter performs work that does not require a finishing touch. Framing and roofing are two of the most common examples, so roofers and framers are rough

carpenters. They are skilled in quickly erecting skeletal structure any kitchen, galley or office.

2.1.3 Plumbing

Plumbing entails installing and maintaining systems used for potable (drinking) water, sewage, and drainage systems (Zakari, 2012). A craftsman with plumbing skills is a plumber. Plumbers also work on infrastructure projects with higher gauge pipes for public water mains and sewer lines. In developed nations, some craftsmen work as gas plumber (Zakari, 2012). A gas plumber specializes in the installation and repair of gas plumbing and fittings, ranging from regulator valves to gas appliances like water heaters and stoves (Attah, 2013). However, due to concerns about the safety of gas, the practice of gas plumbing is regulated by law in many regions of the world, and gas plumbers must complete an apprenticeship and demonstrate competency skills on an exam before they will be allowed to practice independently (Attah, 2013).

2.1.4 Iron fixing/Iron Bending

Iron fixing/iron bending refers to the assembly of the structural framework in accordance with engineered drawings and the craftsman who does this is an iron fixer/iron bender (Illingworth, 2000). The steel fixer is one who specializes in the cutting, bending and fixing of steel reinforcement into forms and in accordance to specification. Reinforcement fixing is highly labour intensive and time consuming (Illingworth, 2000), Ironworkers also unload, place and tie to shape and sizes reinforcing steel bars (rebar) as well as install post-tensioning systems, both of which give strength to the concrete used in buildings, piers,

footings, slabs, and bridges (Zakari, 2012). The ironworker in Nigeria is popularly known as iron bender (Zakeri, 2012).

2.1.5 Construction Painting

Construction painting is the application of paint, stain, and coatings to walls, buildings, bridges, and other structures. The work is majorly in finishing and aesthetics (Illingworth, 2000). Construction painters do the following: (Jarkas, Kadir & Younes, 2012).

i. Cover floors and furniture with drop-cloths and tarps to protect surfaces
ii. Remove fixtures such as pictures, door knobs, or electric switch covers
iii. Put up scaffolding and set up ladders
iv. Fill holes and cracks with caulk, putty, plaster, or other compounds
v. Prepare surfaces by scraping, wire brushing, or sanding to a smooth finish
vi. Calculate the area to be painted and the amount of paint needed
vii. Apply primers or sealers so the paint will adhere
viii. Choose and mix paints and stains to reach desired colour and appearance
ix. Apply paint or other finishes using hand brushes, rollers, or sprayers

2.2 Construction Industry Skills Shortage

In the National Implementation Plan for the Nigerian Vision 20: 2020 covering 2011-2103 investment in construction activity is conservatively estimated at about N 4.4 trillion (Odunsami&Unoma, 2011). This will definitely boost construction activity and will constitute a major challenge for the Nigerian construction sector to provide the resources

required to achieve the stated goals (Odunsami&Unoma, 2011). Construction skills are one of the major resource inputs into construction activity. According to Bustani (2011), the quality and availability of skilled workforce is considered an important factor towards the effectiveness of the construction sector. However, various reports have indicated the existence of shortages and poor quality of craftsmen in the Nigerian construction industry (Dantong, Lekjeb&Dessah, 2011). The demand for construction of more buildings and modern infrastructures is rapidly increasing in response to increase in population, taste and modernization. This is supported by Ade, Musibau and Habila (2015) that states that in Nigeria, the demand from clients for higher quality building has also raised some concern amongst contractors about inadequacy of skilled and qualified manpower Inadequate skills and competencies coupled with poor management approach to skills crisis had provided the building construction industry with enormous challenge of satisfying skill demand. According to Odunsami and Unoma (2011), the stock of competent skilled construction workers has dwindled and the industry which is expected to be the highest employer of labour after agriculture is populated with largely unskilled, inefficient and dissatisfied workers who see work in the industry as a stopgap till "better things in the future. Odunsami and Unoma (2011) also said that Construction output productivity depends significantly on skills of craftsmen but cases of skills supply not satisfying skills demand is becoming a big challenge to the construction industry According to Royal Institution of Quantity Surveyors (2015) the alarming skills shortages in the construction industry could threaten 27,000 projects a year by 2019 in the U.K. A CIOB (2008) Skills survey clearly pointed to a shortage of skills in the UK construction industry and the situation was expected to become worse. Craftsmen were viewed as the most difficult people to recruit,

the industry's image and lack of suitable vocational courses and apprenticeship was quoted as the main reasons for this shortage.

In the construction industry, employment is characterized by relatively high rates of attrition among subcontractors as well as waged workers, and this is manifested in periodic labour shortages (Oseghale, Abiola-Falemu&Oseghale, 2015). The finding of CIOB (2008) indicates that a shortage of skills Labor continues to be a challenge for the construction industry. The CIOB (2008) predicted that this issue is likely to worsen as the demand for construction increases. People possessing crafts/trades skills are highly sought after. From time to time employers in a number of countries refer to the difficulties they have in recruiting labour of the requisite quality, even on occasion when the labour market is relatively slack (CIOB, 2008) Skilled craft shortage is not a shortage of workers rather it is a shortage of adequately trained skilled and productive workers available for certain jobs (Dantong et al. 2011) With the construction industry requiring some of the most highly skilled workforce to do some of the risky jobs, replacement and recruitment proves to be difficult. Reasons that have been given for the skilled labour shortage include lack of training, an aging workforce, poor image of the workers, and an industry that does not appeal to many youths. (Attar, Gupta & Desai, 2012)

The Nigeria construction industry currently operates under a shortage of qualified skilled workers with its attendant consequences (Odunsami&Unoma, 2011). The demand for construction skills in Nigeria currently outstrips the available supply. The situation is expected to get worse if nothing is effectively done to tame this tide of skills shortage (Odunsami&Unoma, 2011).

Skills shortage has over the years brought about low productivity, starting from poor workmanship, delays, reworks in the building industry (Sanni& Alabi, 2008) The Nigerian construction industry is challenged by a widening gap or shortages of skills. According to Sanni and Alabi (2008), this is evident in the fact that most skilled workers in the country

are migrants from neighbouring West African countries like Ghana, Benin Republic and Togo. In this era of increased global competitiveness where 'survival' depends largely on labour optimization, it is imperative that construction industry stakeholders understand fully the phenomenon of 'skills shortage Buchanan (2005) defined skills crisis, as a failure of the skill formation system – failing to meet the current and future needs Darren et al. (2012) consider skill shortage to occur when the demands for workers for a particular occupation is greater than the supply of personnel who are qualified, available and willing to work under existing market conditions, and if the supply is greater than demand then there is a surplus.

2.2.1 Construction industry skills demand

Demand for construction skills refers to the quantity and quality of skills required to produce a required level of construction output. This therefore means that the demand for construction skills is dependent on demand for construction works which is cyclical, seasonal, and dependent on the state of the economy and on government fiscal policy (Odunsami&Unoma, 2011).

In Nigeria, the determination to own homes, the necessity to improve existing structures, emerging need for new infrastructures, changes in taste of clients, technological improvements, population growth, changing climatic and atmospheric conditions and a

host of other factors imposed on the building construction industry an active continuous demand for skills (David, 2008). According to Edoghogho (2011), the changing taste of clients has made it imperative for organisations to embark upon training and re-training of operatives. David (2008) also collaborates that construction industry stakeholders are faced with challenges such as higher clients' requirements which translates to increased complexity of modern construction projects, impact of computerization and; competition within the industry. Oranu (2010) also observed that there are many factors that have contributed to the ever rising demand for skills in the labour market which include the following; technological and organizational change, trade, deregulation of key industries and the decline of unions. These developments have increased construction skills demanded by quantity and quality. This expertise is in the form of masonry, Iron bending, Painting, plumbing, electrical works, roofing, carpentry, tilling etc.

2.2.2 Construction industry skills supply

Skills supply represents the provision or availability of competencies and capabilities in the building construction industry. According to Odunsami and Unoma, (2011), Supply of construction skills refers to the various means for providing the skills demanded by the construction industry. These include: Providing full training for new entrants into the industry, providing top up training for partly skilled persons in the industry, employment of appropriately trained persons from other geographical locations and re-skilling persons already in the industry to cope with changes in skills requirements due to changes in technology. availability of man power in qualitative and quantitative terms, is very crucial in housing construction and constitutes the second largest single component of resources

input required by the building construction industry (Jinadu, 2004). The production or supply of skills in the construction industry is the duty of government, private sector and industry players. This is done through the provision of skills acquisition and vocational centres, technical colleges, traditional apprenticeship, trainings, seminars etc (Dantong et al. 2011). The construction industry needs the skills supply to be equal or in surplus to skills demand for it to be above board (James, Rust &Kingma, 2012)

2.3 Factors Responsible for Skills shortage

Although, the task of identifying the main factors responsible for skill shortage is so daunting, various reports have indicated the existence of shortages and poor quality of craftsmen in the Nigerian construction industry (Dantong, Lekjeb&Dessah, 2011) ; Ade, Musibau and Habila (2015), These past studies attributed skills shortages to such factors as; aging of skilled craft workers in the industry, decline in the number of new entrants into skilled trades, poor finding and ineffective state of vocational education and training / retraining system in the country. Others include: poor image associated with construction labour as work done by less intelligent people, lack of commitment by government and the construction industry towards skills training. Some other factors are outlined below;

i. The inability of the industry to create a good management strategy for optimal utilization of existing workforce that will ultimately reduce skills recruits, recruitment time and work flexibility (Ejohwomu, 2007).
ii. Lack of sustained training and retraining programs for skilled workers either by government agencies or other employers of labour. The implication is a skilled force that is not abreast of new trends in the industry (Ade et al. 2015).

Surprisingly, most construction firms in Nigeria seem to focus on the financial gains forgetting the people that make the job and money (Ade et al. 2015). According to Onuka (2006), the absence of craftsmen training and retraining programme in an organization often manifests tripartite problems if incompetence, inefficiencies and ineffectiveness. Therefore, without a training policy provided by an organization the tripartite problems earlier mentioned will be imminent. It was also suggested that training and development should be viewed as veritable tools that help to improve the outdated nature of the construction industry in to a modern construction industry through updating of staff and manpower development to (Onuka, 2006),

iii. Casualization of skilled workers and poor retention of skills by industry operators. Most construction firms in Nigeria do not have craftsmen in permanent employment. They are employed and laid off as soon as the project is completed. Fagbenle, Ogunde& Owolabi (2011). This practice is a source of discouragement to the younger ones who might want to take up career in the industry.

iv. Low wages paid to skilled workers by their employers. This translates to poor motivation for the craftsmen. Fagbenle et al, (2011) discussed that motivation of skilled workforce can be achieved in many ways, but whatever method is adopted, it must be realized that economic rewards must be among the chief consideration. It is therefore necessary that a sound wage policy is laid down with well-structured incentive and bonus plan. Another study by Ugheru (2006), opined that other considerations to aid motivation include: financial incentives, promotion, job security, welfare package, and participation in decision making and among others.

v. Absence of a clear career path which impedes career progression among skilled workers. Poor image and career paths over the last couple of years has discouraged young people from seeing the construction industry as a viable career path. Darren et al. (2012).

vi. Technical colleges and vocational training schools have become glorified secondary schools where focus is on cognitive or theoretical knowledge and instruction in skills is de-emphasised (Odunsami&Unoma, 2011) Students in technical colleges see themselves as being trained to perform supervisory roles rather than to do actual physical work.

vii. Poor funding of the practical aspects of the vocational education resulting in poorly equipped training workshops and inadequate and poorly trained staff (Odunsami&Unoma, 2011)

viii. Lack of organised apprentice schemes. It suffices to note here that apprenticeship is a major way of skills training in Nigeria. Awe, Stephenson & Griffith, (2010) notes that if this trend is left unchecked, the Nigerian construction industry faces a situation where it will have many graduates of construction related fields but an insufficient number of craftsmen who can efficiently and effectively do actual work. This they insist will be catastrophic for the industry and the economy as a whole.

ix. The introduction of new technologies which have reconstituted the skills required. Innovations in the construction industry had brought about demand for unconventional skills which are not readily available. According to Okuntade (2014), the construction industry all over the world have been adapting to the

sporadic change in technology with skills acquisition programme to meet demands. Most times there is need for overseas training, and this might be very expensive. For the construction industry to be able service the economy, it has to parade competent hands in its operation, which includes credible consultants and contractors with qualified and competent craftsmen (Dantong et al., 2011).

x. The growth in self-employment amongst craftsmen who no longer want to be answerable to anyone. The quest for people to become their own boss had lured many craftsmen from the industry (Awe et al, 2010).

xi. The use of labour only sub-contractors which have reduced the commitment and investment in training within the industry. Most construction industry operators are in the practice of subcontracting labour, this had reduced their commitment to training activities (Awe et al, 2010).

xii. Self-employed craftsmen in turn are not able to handle their qualification improvement issues and there is a direct correlation between the fall of trainee members and the numbers of self-employed (Ade et al, 2015).

xiii. The poor image of the industry which unfavourably affects the popularity as a career choice. The image is low among workers themselves as the majority of construction crafts workers of various ages and experience would never recommend their trade to their children. This had resulted in poor interest from the younger ones. According to Awe (2006) Nigerian youth no longer show interest in skill acquisition unlike the case in developed countries such as the UK where reports indicate that demand from young people for apprenticeships is outstripping the number of training places available in the industry.

xiv. Aging workforce being experienced in the construction industry is another serious problem. Awe et al. (2010) said that Nigeria's youth no longer show interest in skill acquisition unlike the case in developed countries such as the UK where reports indicate that the demand from young people for apprenticeships is outstripping the number of training places available in the industry. This is one of the greatest challenges currently facing the construction industry, as the current average age in trained craftsmen and artisans in the sector is between 45-50 years and fewer skilled workers are available to replace the aging workforce (Ade et. al. 2015) According to Dantong et al. (2011), if this trend is not checked, in the nearest future craftsmen and artisans that really worth their onion would have gone into extinction.

xv. The dissatisfaction with labour organization. The compromising nature of construction labour unions has brought about unstable workload for craftsmen who soon get dissatisfied with the industry (Dantong et al. 2011),

xvi. The site safety and quality of work environment are always the least and last to be attended to. Many construction industries neglect the safety of workers, while the toil in a very unsafe work environment (Ade et al. 2015).

xvii. Gender imbalance. Lack of female participations in skills acquisition in the industry is a serious challenge that must not be left to persist (Awe et al, 2010) the physical nature of work in the industry had scared women from almost every part of craftsmanship. The combination of these factors had led to a labour market depleted of skilled workers with demands outstripping supply in all facets (Awe et al, 2010).

2.4 Addressing Skills Shortage

The success of any construction project is largely dependent on the availability of continuous skilled labour at all levels. Although the sector is reputed for generating a lot of employments, it still suffers from insufficient skills (Chris, 2015). Over the last two decades, the gaps between the skills available and skills required among construction work force has widened considerably and there is an urgent requirement to bridge this skill gap (Chris, 2015).

The problem of the industry according to Dantong (2007) is how to reconcile the need for a supply of manpower capable of high productivity in carrying out simplified sequential operations and retains a substantial number of craftsmen capable of high skilled work. Although it would be unsafe to argue that the construction labour market can one-day- be at equilibrium at the wage for which the quality demanded is equal to quantity supplied because all other factors cannot be held constant in reality (Ejohwonu, 2007). However, with a good working knowledge of the factors that hinder the sufficient supply and demand for construction skills acceding a labour market, which tends towards equilibrium is not unrealistic Vigorous studies in the past had suggested many ways of managing skills crises. Such ways as improvements on the side of government in terms of policies, improvements of training methods like apprenticeship (Sanni& Alabi, 2008), on the job training, creating career part for skills, improving the image of the industry to encourage new entrants, upward review of wages for skilled workers, and a host of other strategies. Unfortunately, not much has been achieved in creating an equilibrium or a-near-equilibrium stance in the demand and supply of skills. In view of the above, and as a

strategy, efforts must be made to improve the present stock of skills as a way of managing skills crisis. According to Ejohwonu, (2007), such methods are multi-skilling present pool of skills, retraining of existing skills to take up new challenges in the industry and retaining of existing skills to allow for sustainable utilization of existing work force to forestall skills turnover and encourage new entrants.

2.4.1 Multi-skilling the workforce

The poor image of the construction industry makes it difficult to attract new workers. According to Ade et al. (2015), the construction industry lacks appeal to young, potentially skilled workers which increasingly give poor image associated with construction labour as work done by less intelligent craftsmen (incompetent craftsmen). Similarly, Darren et al. (2012) opined that this is due to the inefficiencies which lead to poor workmanship that result to rework that brings about cost and time overrun. Poor image and career paths over the last couple of years has discouraged young people from seeing the construction industry as a viable career path These and other factors have led to difficulties in recruiting skills among the construction companies. To be competitive in the construction industry, it is necessary to consider other crisis management strategies to mitigate this trend. One potential strategy is called multi-skilling (Ejohwonu, 2007), Research results indicate that multi-skilling can reduce number of skills required, increase the productivity, quality, and continuity of work, while providing for a safer site and providing managers more flexibility in assigning tasks (Li-Cheng (2010)). Field studies have also indicated that multi-skilling may benefit workers. Such benefits include longer employment duration,

better qualifications resulting in increased employability, and increased job satisfaction (Li-Cheng, (2010)).

Multi-skilling has been viewed from different perspectives. Ejohwomu (2007) defined multiskilling as a labour utilization strategy that is motive driven, factor influenced-regardless of any limitations and benefits inclined. A multi-skilled construction trade worker is an individual who possesses or acquires a range of skills and knowledge and applies them to work tasks that may fall outside the traditional boundaries of his or her original trade (Dada & Ekpe, 2006). The author also affirmed that with multiskilling, workers possess a set of skills that are appropriate for more than one work process and that can be deployed and used flexibly on a project or within an organization. In a construction context, this does not necessarily mean that a worker obtains or possesses mastery level skills in multiple trade areas. However, based on the flexible application of skills the worker already possesses or is willing to acquire, the worker can be an effective and productive contributor to the work output of several traditional trade disciplines. Fundamentally multi-skilling can be considered as increasing people's skills and competencies, enabling them to carry out tasks previously or traditionally carried out by other persons (Caroline & Wright, 2001). According to Caroline & Wright, (2001), organisations typically multi-skill with the intent of removing functional barriers and increasing the flexibility of the workforce, it is rarely about the ideals of job enrichment and empowerment. Multi-skilling in the UK can be considered to be essentially job enlargement and skill broadening, using people to cover a larger proportion of production activities, with the intention being to reduce labour (Cockrill & Scott, 1998). In practice, multi-skilling could be incidental or planned. Incidental refers to multi-skilling that takes

place without the management or the craftsman planning or taking note of it. While planned multi-skilling refers to a strategy driven type of multi-skilling (Caroline & Wright, 2001). The management had done an evaluation of the skills strength and had assembled a well-planned strategy to multi-skill the workforce. Whether as incidental or planned, for the purposes of this review we consider multi-skilling to fall into the following categories as defined by (Li-Cheng, (2010).

2.4.1.1 Vertical multi-skilling

This process is the extent to which supervisory or administrative support tasks are learned by craftsmen (Li-Cheng, (2010). For example, a mason/bricklayer becoming a foreman and takes some elements of management, e.g. work planning, quality control, work supervision etc. This could be a team leader or a member of a self-managed team (Li-Cheng, (2010). Basically, this type of multi-skilling takes place along the same career path either upwards or downwards.

2.4.1.2 Horizontal multi-skilling

This is learning skills from another discipline or function within an organisation. For example, an electrician is learning some plumbing tasks or a mason/bricklayer learning some carpentry skills (Li-Cheng, (2010). According to (Li-Cheng, (2010) horizontal Multi-skilling can be considered as two main types:

Skill broadening – where minor elements and tasks are learned on top of the predominant skills or task. So expertise is maintained in the major task with elements added to increase

efficiency. For example, a mason/bricklayer may learn how to dismantle or remove formwork from the concrete to allow for further works to avoid the use of a carpenter.

Cross skilling/dual skilling – where another major activity is learned in addition to the main craft and a person is considered competent to carry out any activity in these two main disciplines. For example, multi-skilled craftsmen considered competent to carry out both iron work (iron bending) and carpentry tasks. An electrician can equally carry out the task of a painter.

2.4.1.3 Depth Multi-skilling

This is the acquisition and application of more complex, specific skills within the same trade or discipline, for example a building electrician acquiring specific skills, such as expertise in power systems, telecommunication, and security systems like installation of CCTV cameras (Li-Cheng, (2010).

2.4.2 Typical examples of multi-skilling

Typical activities that craftsmen are trained to carry out are briefly listed out here as given by Caroline & Wright (2001). Multi-skilling operators or project managers, for example, can involve equipping a mason with the skills to:

i. Traditionally build with the sancrete block;
ii. Build with the bricks (most masons do not know how to build with bricks)
iii. Plan and lead construction work process;
iv. Do plastering work;
v. Do wall screeding work.

Traditionally craftsmen learnt just one trade, for example being a plumber, an iron worker, a painter or a carpenter (Li-Cheng, (2010). Multi-skilled craftsmen can take a number of forms, for example, an individual is trained in the other main discipline, and would be competent in both carpentry and plumbing skills. So a carpenter would learn plumbing skills such as:

i. Wall chasing skills;

ii. Basic pipe joinery and handling;

Iii. Leakage monitoring;

Iv. Water pressure analysis;

Some organizations also multi-skill to ensure that incident management is adequate and appropriate. In these situations, individuals are equipped with adequate skills and knowledge to competently handle an abnormal or emergency situation (Matias-Reche& Fuentes-Fuentes, 2006) Multi-skilling is used in incident management scenarios, where it is imperative that there are appropriate skills to manage an incident or event at all times. This means that there has to be flexibility within the team to ensure competent cover for lunch and other breaks, as well as for training and holidays (Keiber, Riley &Jones 2000)

Multi-skilling staff in emergency management shares elements of vertical and horizontal Multi-skilling, where staff may have to assume a more senior role than their status traditionally allows because of the incident scenario (Keiber et al. 2000)

2.5 The Impact of Multi-skilling

Multi-skilling plays an important role in reducing workforce demand, fulfilling job flexibility for the purpose of better management. This is believed to be the most cost-effective way to improve labour productivity, and to create a more flexible workforce within construction firms (Matias-Reche& Fuentes-Fuentes, 2006). This is because multi-skilled workers are capable of working across traditionally distinct occupational boundaries because of the increasing pool of skills and concomitant loss of emphasis on job demarcation (Matias-Reche& Fuentes-Fuentes, 2006).

In Caroline & Wright (2001) benefits of multi-skilled labor utilization were observed with regard to total project labor cost, employment opportunities for construction workers, and other industry labor issues. These benefits included conservative estimates of 5% or more total labor cost savings, a potential 35% reduction in required project workforce, a potential 47% increase in average employment duration, and an increase in wage/annual earning potential for multi-skilled construction workers (Keiber et al. 2000). In addition, multi-skilling involves the creation and promotion of dynamic capabilities. These capabilities allow rapid response to a variety of unpredictable contingencies and demand changes (Ittner&Kogut, 1995).

Multi-skilling has provided benefits for both organisations and individuals, as it enables organisations to cope with rapidly changing environments, and on the other hand, sustains the employability of individuals (Keiber, Riley &Jones 2000). Generally, multi-skilling has many advantages, and the adoption for strategic skills crisis management and human resource development in the construction industry is encouraged (Caroline & Wright,

2001) According to a study undertaken at Charles Sturt University (2009) the notion of multi-skilling has been evidently proved to have many advantages.

2.5.1 Workforce savings

The main aim of multi-skilling is to develop a workforce that work across traditional duty boundaries and ultimately reduce skills demand and recruitment while the job is done with fewer skills (Kelliher et al., 2000). Research studies reveal that the benefits of multiskilling are labour cost savings and fewer workers needed; it also enables an increase in average employment duration and of earning potential for multi-skilled construction workers (Irene, 2009). Multi-skilled workers have contributed significantly to the substantial workforce savings so that the cross-training depth of 50% is sufficient to provide 80% of the available savings from cross-utilisation (Keiher et al., 2000).

2.5.2 Time saving

The success of any construction project is also measured by the degree of compliance with stipulated time of completion (Ayegba& Edwin, 2014). But shortages of skills with the attendant time spent on recruitment are a menace staring contractors in the face (Medugu, Majid, Bustani, Bala, Abdulahi&Mbamali, 2011), But multi-skilling process is known to have reduced number of skills demanded and also saves idle times among craftsmen onsite. (Keiher et al., 2000).

2.5.3 Flexible Workforce

According to Irene (2009), multi-skilling makes workers more competitive as they stay longer on a project; they can be utilized more flexibly including unforeseen maintenance activities and since multi-skilled workers and crews have a broader variety of skills. It enables workers to perform a large number of tasks, allowing them to fill in for other workers and increase workforce flexibility (Irene, 2009). Multi-skilled workers have improved the quality of service by reducing departmental boundaries, as there is teamwork and inter-departmental cooperation (Keiher et al., 2000). Thus, multi-skilling is beneficial to firms only if labour flexibility can be mobilized (Huang & Cullen, 2001)

2.5.4 Communication of skills

Multi-skilling practice had proved to enable workers to increase the understanding of other tasks and improve coordination within their knowledge of various tasks (Keiher et al., 2000).

2.5.5 Employment security

It enables workers to freely upgrade themselves and sustain themselves if skills become obsolete because of new technology. Higher retention results from the provision of a greater variety of jobs with further skills training and development (Keiher et al. 2000).

2.5.6 Efficiency

Multi-skilling practice enables workers to satisfy customers through the decrease of labour cost due to reduction of turnaround time and number of workers involved (Charles Sturt University, 2009).

2.5.7 Job satisfaction

Multi-skilled workers are more satisfied with their jobs because of more variety and interesting work (Lockyer, 2007).

2.5.8 Better pay and promotion

Multi-skilled workers receive higher rates of pay (Clark, 1989). This is because they are engaged in different work activities on the same site. Multi-skilled workers have gained more opportunities to be promoted within the organization (Clark, 1989).

2.5.9 Management effectiveness

It enables managers to reduce the product completion time, to decrease project planning time, and to cut back on administration costs (Charles Sturt University, 2009). In summary, there are six benefits regarding the results of multi-skilling in the construction industry that have been identified (Keiher et al., 2000). The first three attributes are related to organisational benefits, whereas the last three attributes are related to individual benefits. Although multi-skilling promotes such benefits, the consequences of increasing job complexities and work intensity stresses have been raised, which require attention when implementing such training (Keiher et al., 2000).

2.6 Impediments to Multi-skilling

One of the known criticisms of the concept of multi-skilling has been associated with the consequences of 'change' implementation and a barrier to specialisation (Burleson, 2002). Carmichael and Macleod (1993) argued that although training workers in several jobs is a successful redress for labour market shortfalls there have been retrospective periods when a singly skilled workforce has resisted adopting labour saving changes for fear of losing their jobs. Other impediments include limits on skills retention, complexity of maintaining a multi skilled workforce from management and human capital investment perspectives and high cost of training (Burleson, 2002)

2.7 Enhancing Multi-skilling

The introduction of multiskilling within organisations is typically carried out with the aim of managing crisis generated by inadequacies of required skills, improving efficiency, reducing costs, improving quality and increasing production (Caroline & Wright 2001). Multi-skilling is a technique that can be used by companies or firms as part of their process of reorganisation (Burleson, 2002) Companies from a range of sectors including the construction industry can adopt multi-skilling. In order to escape the impediments to multi-skilling or enhance the practice of multi-skilling, a detailed outline of the issues to consider in the implementation of multiskilling must be considered. The multi-skilling process is comprised of the following elements (Caroline & Wright, 2001)

i. Decision to multi-skill and Starting out
ii. Planning and assessment

iii. Implementation

iv. Implementation Check

v. On-going review and Maintenance/retention.

2.7.1 Decision to multi-skill and Starting out

This is the point in time when the prospect of organisational change has just been recognized and the form of such changes is being conceived. When a decision to manage organizational skills crisis by multi-skilling is made (Caroline & Wright, 2001). The management objectives are to:

i. Recognise instances of multi-skilling, the necessity judging from the level of skills crisis;

ii. Identify key risks and assess the criticality of these;

iii. Specify as a matter of policy / principle to ensure due account is taken of complexities of construction requirements during the multiskilling process.

2.7.2 Planning and assessment

The next step following initial outline planning involves considering in detail the steps required to carry out prior to implementation (Caroline & Wright, 2001). This is when decisions are being made on details of multi-skilling such as: (Caroline & Wright, 2001)

i. Which individuals will be multi-skilled;

ii. Which tasks will be included in the remit of multi-skilling;

iii. How will people be trained and supervised;

iv. How procedures and working practices are to be changed;

v. Staff headcount reductions.

The objectives of this stage in the multi-skilling process is given by Caroline & Wright (2001) as follows;

i. Ensure that due account is taken of workload, competence, supervision and other factors when making specific decisions about multi-skilling,
ii. Ensure that suitable and sufficient risk assessments are completed, and;
iii. Ensure changes are developed in a planned and systematic manner, including identification of all actions necessary to enable change to be made successfully.

2.7.3 Implementation

This is where changes are implemented, and the detailed planning turned into operational reality (Burleson, 2002). Possible steps include staff being made redundant, retrained, new ways of working are introduced, and so on (Caroline & Wright, 2001). The management objective is to:

i. Ensure implementation is properly resourced, scheduled and organised so that planned changes are carried out effectively;
ii. Flexibility is built in, so that unplanned changes training takes longer than originally anticipated

2.7.4 Implementation check

According Caroline and Wright, (2001), it is essential to understand the differences between project inputs, outputs, outcomes, and impact, since the indicators to be measured under the implementation check will most likely reflect this hierarchy. This is the point

following the implementation process, where changes have been completed, or are well underway (Burleson, 2002). The objectives are to ensure planned training, supervision, etc. has been carried out as intended and has achieved its required performance objectives (Caroline & Wright, 2001). This stage provides an opportunity to modify implementation, and to take into consideration feedback and issues arising.

2.7.5 Ongoing skills maintenance/retention & review

In the period following implementation it is important (Caroline & Wright, 2001).

i. Ensure that skills are maintained/retained at both an organisational and individual level;
ii. Detect any latent skills problems, and;
iii. Seek opportunities to improve craftsmen performance amongst multi-skilled staff.
iv. Industry skills, skills demand and supply, skills crisis and multiskilling as a skills crisis management strategy in the building construction industry.

2.8 Conclusion

According to Bustani (2011), the quality and availability of skilled workforce is considered an important factor towards the effectiveness of the construction sector. However, various reports have indicated the existence of shortages and poor quality of craftsmen in the Nigerian construction industry (Dantong, Lekjeb&Dessah, 2011). According to Odunsami and Unoma (2011), the stock of competent skilled construction workers has dwindled and the industry which is expected to be the highest employer of labour after agriculture is

populated with largely unskilled, inefficient and dissatisfied workers who see work in the industry as a stopgap till “better things in the future. Dantong, Lekjeb and Dessah, (2011) ; Ade, Musibau and Habila (2015), attributed skills shortages to such factors as; aging of skilled craft workers in the industry, decline in the number of new entrants into skilled trades, poor finding and ineffective state of vocational education and training / retraining system in the country. Others include: poor image associated with construction labour as work done by less intelligent people, lack of commitment by government and the construction industry towards skills training. According to Sanni and Alabi, (2008), such measures as : on the job training, creating career part for skills, improving the image of the industry to encourage new entrants, upward review of wages for skilled workers, and a host of other strategies have failed in reducing skills shortage. One potential strategy to tackle skills shortage might be multi-skilling multi-skilling. (Ejohwonu, 2007).

Although these past studies indicate shortage of skills, identified responsible factors and suggest that multi-skilling might reduce skills shortage, this study (Assessment of Multi-skilling in Nigerian Construction Firms) seek to identify the specific skills that are lacking, identify the most important factor responsible for skills shortage, assess the level of multi-skilling practice among professionals and craftsmen, identify the most important impediment to multi-skilling practice and identify the most important way of enhancing multi-skilling in building construction firms.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Research Design

A research design is viewed as the functional plan in which certain research methods and procedures are linked together to acquire a reliable and valid body of data for empirically grounded analyses, conclusions and theory formulation (Vosloo, 2014). The research design thus provides the researcher with a clear research framework; it guides the methods, decisions and sets the basis for interpretation (Vosloo, 2014). It refers to entire process or approach adopted in obtaining information and data for a successful study (Bhojanna, 2007). The research design therefore, should be seen as a mixed-bag approach that implies choosing from different alternatives and options to ensure that the research purpose and perspective are clarified and achieved (Vosloo, 2014).

This study chose a survey research approach. This approach studies a population by collecting and analysing data from items believed to be a representative of the entire group. In other words, only a part of the population is studied, and findings from this are expected to be generalised to the entire population (Bryman & Bell, 2003).

3.1.1 Research method adopted for the Study

The study adopted the quantitative research method. Quantitative research method generates numerical data or information that can be converted into numbers. It focuses more in counting and classifying features and constructing statistical models and figures to explain what is observed (Bryman & Bell, 2003). This dwells principally on obtaining responses from respondents with the use of questionnaires. Questionnaire survey was adopted for this research in agreement with the assertion of Kasimu& Usman (2013) which

states that the beliefs, perception, ideas, views and thought of respondents about area under study can be acquired very easily due to the flexible nature of questionnaire survey which can also be in a structured format and can cover a large number of sample of individuals from a population. Similarly, Ayegba and Edwin (2014) in Assessment of Craftsmen Turnover in the Construction Industry, adopted the use of questionnaires to obtain opinions of respondents (craftsmen) in the study

3.2 Population, Sample Size and Sampling Technique

3.2.1 Population and sample size

A research population consists of the totality of the observation with which the researcher is concerned. Cavana, Delahaye& Sekaran (2001) stressed that target population refers to an entire group of people or things of interest that researchers wish to investigate. The population for this research is the total number of Abuja based building construction firms with updated remittance or contribution to the Industrial Training Fund (ITF). The study considered ITF because it is a body saddled with responsibility for skills training in Nigeria. According to ITF (2015), the entire construction industry is cartegorised to help record management. These are the civil construction firms, building construction firms, the construction services consulting and the construction allied services firms. There are 170 building construction firms with updated contributions as at October, 2015.The industrial training fund (ITF) was set up under the Act No 47 of 1971 to promote and encourage the acquisition of skills with a view to generating a pool of indigenous trained manpower sufficient to meet the need of the economy. The Act provides that the scheme is to be

financed through contribution from employers and subvention front the federal government (ITF, 2015).

3.2.1.1 Sample size

The sample size is very important in any study that aims to make conclusions or inference on the population because it always not possible to study the entire population. Sample size determination is the technique of determining the number of observation to include in a sample (Singh & Masuku, 2014). The sample size in this research was calculated using Cochran's formula for determining sample size cited in Bartlett, Kotrlik& Higgins (2001). The sample size for this study is obtained as shown;

Cochran's (1977) formula for determining sample size

$\underline{n}_0 = \frac{t^2 \; X \; (p)(q)}{d^2}$……(3.1)

$\underline{n} = \frac{n0}{(1+\frac{n0}{\underset{ation}{popul}})}$ (correction formula for final sample size)……(3.2)

Where t = 1.96 obtained for alpha level of 0.05 (which is usually between 0.05 and 0.01 for most educational research).

Where $\underline{n}_0$ = Sample size

Where $\underline{n}$ = Corrected sample size

Where $(p)(q)$ = Estimate of variance = 0.25

Where "d" = acceptable margin of error for proportion being estimated = 0.050.

According to Bartlett *et al.* (2001) a margin of error between 3% and 5% is acceptable for educational and social research.

Population (N) = 170 (representing number of construction firms that remit to ITF in Abuja)

$\underline{n}_0 = \frac{t^2 \ X \ (p)(q)}{d^2} = \frac{(1.96)^2 \ X \ (0.5 \ X \ 0.5)}{(0.050)^2} = \frac{3.842 X \ 0.25}{0.0025}$

$\underline{n}_0 = \frac{0.9604}{0.0025} = 384$. Therefore, $\underline{n}_0 = 384$ the value for $\underline{n}$ can be obtained as presented

$\underline{n} = \frac{n0}{(1 + \frac{n0}{population})}$ (correction formula for final sample size)

$\underline{n} = \frac{384}{(1 + \frac{384}{170})}$, $\underline{n} = \frac{384}{1 + 2.26} = \frac{384}{3.26} = 117$ (actual sample size). Fred, (2015) opined that sample should be increased by 15-25% in studies that require response from craftsmen/artisans because of their known reluctance to respond to questionnaires. This study added 20% of 117. $= \frac{20}{100} \text{x} \frac{117}{1} = 23.4$. no= 140 construction firms.

3.2.2 Sampling Technique

A probability (simple random sampling) sampling procedurewas adopted for the selection of building construction firms from the population for this study. Probability sampling (or representative sampling) is most commonly associated with survey-based research strategies where you need to make inferences from your sample about a population to meet your objectives (Saunders, Lewis & Thornhill, 2009). The use of random number table was employed. Each case within the sample frame was assigned a number on the random number table. These numbers were picked at random to select the samples. The study used simple random technique because it helps to reduce potential bias in selection of cases to be included in the sample, it presents the study with a sample that is highly representative

of the population and this method allows for generalisation by way of statistical inference (Welman, Kruger & Mitchell, 2009).

3.3 Data Collection

Data is defined as information obtained during the course of an investigation or study (Leedy& Ormrod 2013). This study made use of primary data.Primary data consists of a series of original data collected by the researcher (Siewe, 2016). Primary data collection was accomplished through the use of questionnaires.

3.3.1 Data collection instrument

Data collection instruments refer to devices used to collect data such as questionnaires, tests, structured interview schedules and checklists (Teddlie &Tashakkori 2009). The main primary data collection instrument in this study is the questionnaire survey. According to Creswell (2014) a questionnaire survey is a means of obtaining numerical data regarding attitudes, trends and possibly opinions from a sample that is representative of a larger population. This study decided to obtain data primarily using structured questionnaires. This is because similar studies by (Ayegba& Edwin 2014) and Oseghale*et al*., (2015) in their respective study of Assessment of Craftsmen Turnover in the Construction Industryandan evaluation of skilled labour shortage in selected construction firm in Edo state used questionnaires. Similarly,AbdulAzeez (2012) argued that questionnaire is considered to be the most popular data collection technique in social science.

3.3.1.1 Questionnaire design

This study realised that questionnaire design is an important process that can significantly impact on the quality and outcome of the research. According to Zikmund, Babin& Griffin (2003) accuracy of surveys is highly dependent on the appropriate wording of relevant questions. The questionnaires presented standardized questions with good choice of language as adopted from Ayegba and Edwin, (2014) in their study of 'Assessment of craftsmen turnover in the construction industry'. It was however modified to define the objectives of this study. Two forms (one to the professionals and the other to the craftsmen) of questionnaires were designed. Both questionnaires consist of six (A-F) sections, cutting across the entire study. The design is outlined below;

Section A - General Information about the company and respondent

This section made findings on the name of the respondents, the organisation's name and address, size of the organization, years of experience of respondents and their level of qualifications. This is to ensure that respondents are qualified with necessary experience to respond to the research questions.

Section B – Skills shortage and responsible factors in the construction Firm.

Section B is divided into two (B1 and B2). B1 found out the perceptions of the respondents on skills shortages in the building construction firms, while B2 found out perceptions on the causes of skills shortages in the construction firms. The crafts surveyed include the masonry/bricklaying, carpentry, plumbing, iron fixing and painters. A likert scale of 1 to 5 (1=strongly disagree, 2=disagree, 3= neutral, 4=agree and 5=strongly agree) to indicate the levels of perception of respondents was presented on B1 and B2.

Section C – Practice of multi-skilling in the construction Firm.

Section C found out the level of practice of multi-skilling from the respondents. A likert scale of 1 to 5 (1=extremely practiced, 2=highly practiced, 3= moderately practiced, 4=slightly practiced 5=do not practice) to indicate level of practice was presented in section C

Section D – Impact of the practice of multi-skilling in the construction Firm.

Section D found out the perceptions of the respondents on impact of multi-skilling in the building construction firms. A likert scale of 1 to 5 (1=strongly disagree, 2=disagree, 3= neutral, 4=agree and 5=strongly agree) to indicate the levels of perception of respondents was presented on section D.

Section E – Impediments to the practice of multi-skilling in the construction Firm.

Section E found out the perceptions of the respondents on the impediments to the practice of multi-skilling in the building construction firms. A likert scale of 1 to 5 (1=strongly disagree, 2=disagree, 3= neutral, 4=agree and 5=strongly agree) to indicate the levels of perception of respondents was presented on section E.

Section F – Enhancing the practice of multi-skilling in the construction Firm.

Section F found out the perceptions of the respondents on ways of enhancing the the practice of multi-skilling in the building construction firms. A likert scale of 1 to 5 (1=strongly disagree, 2=disagree, 3= neutral, 4=agree and 5=strongly agree) to indicate the levels of perception of respondents was presented in section F.

The design for craftsmen questionnaire is outlined below;

Section A - General Information about the company and respondent

This section made findings on the name of the respondent, the organisation's name and address, size of the organization, years of experience of respondents and employment qualification of respondent. This is to ensure that respondents are qualified with necessary experience to respond to the research questions.

Section B –Skill shortages and responsible factors in building construction Firms.

Section B is divided into two (B1 and B2). B1 found out the opinions of craftsmen on skills shortages existing in the building construction industry. Respondents were presented with options to tick 'YES' or 'NO' for shortages of masonry/bricklaying, carpentry, plumbing, iron fixing/bending and painting skills in the building construction industry. B2 found out the perception of artisans on the causes of skills shortages in the building construction firms. A likart scale of 1 to 5 (1=strongly disagree, 2=disagree, 3= neutral, 4=agree and 5=strongly agree) to indicate the levels of perception of respondents was presented B2.

Section C – Practice of multi-skilling in the construction Firm.

Section C found out from the respondents if they possess skills other than their principal skills. This was an attempt to know if they are multi-skilled. They were presented with

option to tick against one or more of masonry/bricklaying, carpentry, plumbing, iron fixing/bending and painting to indicate other skills they possess.

Section D – Impact of the practice of multi-skilling in the construction Firm.

Section D found out the opinions of the respondents on impact of multi-skilling in the building construction firms. A likert scale of 1 to 5 (1=strongly disagree, 2=disagree, 3= neutral, 4=agree and 5=strongly agree) to indicate the levels of perception of respondents was presented on section D.

Section E – Impediments to the practice of multi-skilling in the construction Firm. Section E found out the opinion of the respondents on the impediments to the practice of multi-skilling in the building construction firms. A likert scale of 1 to 5 (1=strongly disagree, 2=disagree, 3= neutral, 4=agree and 5=strongly agree) to indicate the levels of perception of respondents was presented in section E.

Section F – Enhancing the practice of multi-skilling in the construction industry

Section F found out the opinion of the respondents on ways of enhancing the practice of multi-skilling in the building construction firms. A likert scale of 1 to 5 (1=strongly disagree, 2=disagree, 3= neutral, 4=agree and 5=strongly agree) to indicate the levels of perception of respondents was presented in section F.

3.3.2 Data collection procedure

Two forms of well-structured questionnaires were designed to obtain response from targeted respondents. These questionnaires were accompanied by letters of introduction and plea to fulfil demands of some firms who were not very comfortable with their

employees responding to questionnaires. The opinions of the respondents formed the primary data used in this research. The first form of questionnaires which were self-administered and retrieved over a period of time on different construction sites and offices in Abuja the Federal Capital Territory, were administered to the most senior professionals in the 140 identified building construction firms. The second form of questionnaires targeted the most senior skilled craftsmen in the same construction firms. The study opted for the most senior professional and craftsmen because of their arguable experience and time spent in their respective firms. Where the most senior craftsman does not have skills that fall within the crafts surveyed, the next crafts person in cadre was considered. The craftsmen considered in this study included; masons, carpenters, iron fixers, plumbers and painters. The choice of these is born out of their visible dominance in the building construction industry. According to Abdullahi (2010), cited in Umar (2014), they are most common and available in every building construction activity in Nigeria. Similarly, Oseghale*et al* (2015) described them as most dominant and popular in the building construction firms. The services of well-trained multi-lingual research assistants who served as interpreters were utilized in some instances to curb the challenges of reading and understanding of English language due to general low educational background of craftsmen and their poor motivation to respond to questionnaires. The research assistants helped such craftsmen in filling the questionnaires on the sport. This approach was also employed in Abdullahi *et al*. (2015) where they studied "Artisans working conditions in Nigeria construction industry" and Umar (2014) in his study of 'Assessment of the Training Needs of craft skilled workers in North-West Nigeria.'

3.4 Data Analysis

This refers to analytical plan that helped this research to draw conclusions from the collected data. Data collected was coded and analyzed using Statistical Package for the Social Sciences (SPSS version 22.0) and Microsoft excel. According to Gallen (2010) SPSS is a wide-ranging system for data analysis. It can take data from almost any nature of file and use them to develop tabulated reports, charts, and descriptive statistics.

Descriptive statistical measures comprising the mean, standard deviation and ratios as well as frequencies were used to assemble and then compartmentalize all the data obtained from the questionnaires into meaningful summaries regarding the variables that are under investigation.

CHAPTER FOUR

4.0 DATA PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

4.1 Analysis of Questionnaires

A total 280 questionnaires were administered to the professionals and craftsmen. A total number of 244 questionnaires were returned valid by respondents. The professionals returned 125 questionnaires, while the craftsmen returned 119. The valid questionnaires returned constitute 87.15% of the total questionnaires distributed. This percentage of return is considered substantial for analysis. According to Moser and Kalton (1971) the end result of a survey could be considered substantial if the response rate is not lower than 30-40%.

This is presented in table 4.1 below

Table 4.1: Details of structured questionnaire administered and returned

Questionnaires Administration	Professional's	Craftsmen's	Total
Distributed.	140	140	280
Returned	125	119	244
Percentage of Returned	**89.30%**	**85.00%**	**87.15%**

Source*: Field Survey* (2017)

4.2 Demography of Company and Respondents

Table 4.2 shows the characteristics of firms and respondents. The frequencies and percentages of responses from the professionals and the craftsmen are shown in this table.

The professionals who responded to questions in this study are the Architects (16.8%), Builders (30.4%), Quantity Surveyors (27.2%) and Engineers (25.6%). The highest ((30.4%) respondents are the Builders. It can be inferred that most of the senior professionals in building construction firms in Abuja are Builders. The craftsmen that were interviewed in this study constitute Masons, Carpenters, Plumbers, Iron fixers/Benders and Painters with response of 31.1%, 28.6%, 16.8%, 21% and 2.5%, respectively. It is revealed that, masons have the highest (31.1%) percentage of response followed by the carpenters (28.6%) in the study. It could be inferred in this study that most senior craftsmen in building construction firms in Abuja masons.

Furthermore, result showed that Professionals and Craftsmen with years of experience between 5-10 years have the highest response of 53% and 42.4% respectively. This is followed by Professionals (45%) and Craftsmen (36%) with years of experience between 10-15 years. The Professionals (25%) and Craftsmen (20%) with years of experience above 15 years followed, while professionals (2%) and craftsmen (1.6%) with years of experience between 0-5 years are least in this rating. This shows that most of the professionals and craftsmen interviewed in this study have good years of experience suitable for response to the study.

More so, the respondents that took part in the study have employment qualifications of Ordinary national diploma (OND), Higher national diploma (HND), Bachelors of Science and Technology (BSc and B. tech) and Master's Degree (MSC) with response percentage

of 6.4%, 41.6% and 52.0% respectively. It was observed in the study that no respondent has a qualification of PhD. However, those with qualification of MSC constitute largest percentage of response. The study is confident that the professional respondents are well qualified. The craftsmen interviewed have qualifications of apprenticeship, vocational studies technical school and other qualifications. The craftsmen provided responses of 22.7%, 26.1%, 33.6% and 17.6 % respectively. This study inferred that the technical school is a major supplier of craftsmanship in the construction industry.

Table 4.2: Characteristics of respondents and firms

Respondent's Data		**Professional's**			**Craftsmen's**	
		Frequency (No)	**Percentage (%)**		**Frequency (No)**	**Percentage (%)**
Profession	Architect	21	16.8	Mason	37	31.1
	Builder	38	30.4	Carpenter	34	28.6
	Q/ Surveyor	34	27.2	Plumber	20	16.8
	Engineer	32	25.6	Iron fixer/bender	25	21.0
				Painter	3	2.5
Total		125			119	
Years of experience	0-5 years	2	1.6	15		12.6
	5-10years	53	42.4	51		42.9
	10-15 years	45	36.0	38		31.9
	Above 15years	25	20.0	15		11.6
Total		**125**		**119**		
Employment Qualification	OND	8	6.4	Apprenticeship	27	22.7
	HND/BSC	52	41.6	Vocational studies	31	26.1

	MSC	65	52.0	Technical school	40	33.6
Total	**PhD**	**-**		**Others**	**21**	**17.6**
		125			**119**	

Source*: Field Survey* (2017)

4.3 Skills Shortage in the Building Construction Firms

Respondents were asked to assess the skills they viewed to be lacking in their respective building construction firms. The results of the response obtained from the professionals and craftsmen are presented in Table 4.3 and Figure 4.1 respectively. The data in Table 4.3 presented response from professionals. It shows that 30.4% of the respondents agree on the shortage of masons in the building construction firms. However, 26.4% disagree to the fact that there is shortage of masons. Some (25.6%) of the professional respondents were neutral about shortage of masons in their building construction firms. It was also observed that, 9.6% strongly agreed and 8% disagreed to the shortage of Masonry skills in the industry. Furthermore, most of the professionals remained neutral on the shortage of carpenters in the industry with 41.6% response, 22.4% disagreed, 20% agreed, 11.2% strongly agreed, while 4.8% strongly disagree on shortage of carpenters in building construction firms. Although 41.6% of respondents remained neutral on this subject, 22.4% disagreed. It is inferred in this study that there is no shortage of carpenters in the building construction firms. The professionals' response shows shortage of plumbers in the construction industry as 41.6% agreed, 18.4% remains neutral, 17.6% disagreed, 12.8% strongly agreed and 9.6% strongly disagreed. Professionals' response on possible shortage of Iron workers/Bender shows that 35.2% disagreed that there is shortage of Iron workers,

32% strongly agreed, 18.4% agreed and 14.4% strongly disagreed. Finally, 32% strongly agreed that there is shortage of painters in the construction industry, 23.2% agreed, 20% disagreed, 15.2 strongly disagreed and 9.6% remains neutral. Although some professional respondents gave neutral opinions in some part of this section, indicating that they lack assurance or do not have ideas on the subject matter. It is inferred from the result presented that professionals specifically agreed that masons, plumbers and painters are lacking in the construction industry.

4.3.1 Identification of skill shortage by professionals and craftsmen

Table 4.3: Professionals' response on skills shortage in the construction Firms

	Professionals' Percentage Response				
Skills	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Masonry	8	26.4	25.6	30.4	9.6
Carpentry	4.8	22.4	41.6	20	11.2
Plumbing	9.6	17.6	18.4	41.6	12.8
Iron Fixing/ Bending	14.4	35.2	0	18.4	32
Painting	15.2	20	9.6	23.2	32

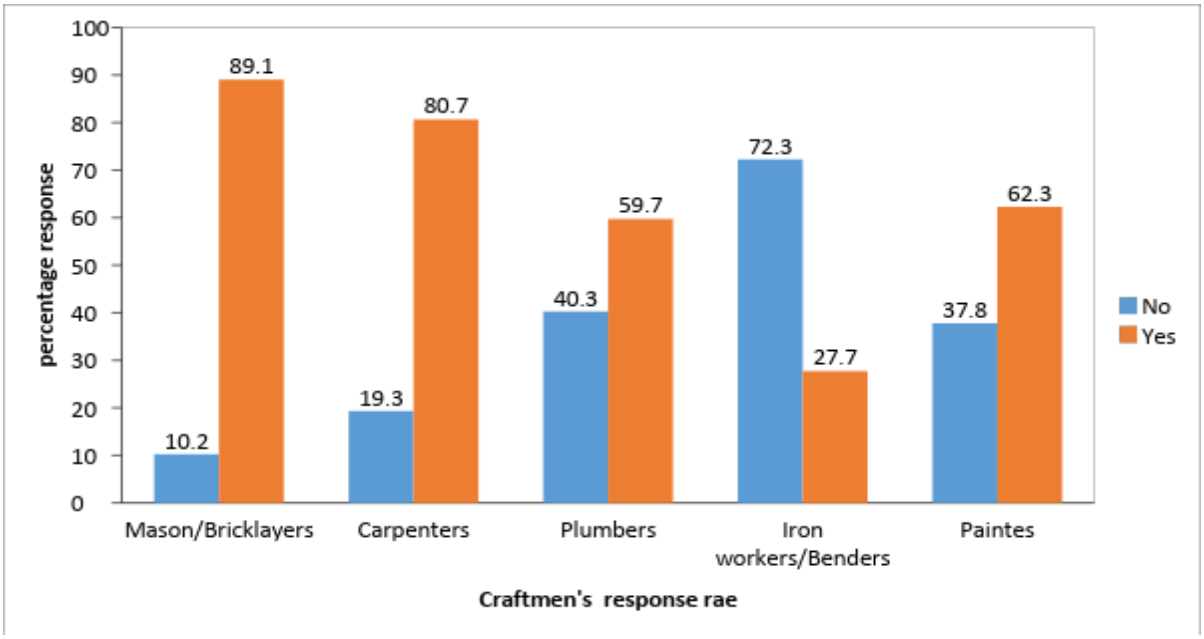

Figure 4.1: Craftsmen's response on skill shortage in the construction industry

The result presented in Figure 4.1 shows that, craftsmen agreed that Masonry/Bricklaying skill is lacking in the construction industry as 89.1% indicated Yes and 10.2% indicated No. Craftsmen also opined that carpentry skills are in shortage as 80.7% indicated Yes and 19.3% indicated No. Furthermore, 59.7% and 62.3% indicated Yes showing that they agree that plumbers and painters are lacking in the construction industry. Iron workers/benders are observed not to be lacking as 61.3% and 72.3% indicated No respectively. It can be inferred from the data showed that; there are skills shortage of Masons, Carpenters, Plumbers and Painters in the construction industry.

4.3.2 Factors responsible for skills in the Building Construction Firms.

Tables 4.4 and 4.5 present response details of professionals and craftsmen on the factors responsible for shortage of skills in the building construction industry. The mean scores of their responses are indicated and ranked accordingly from the highest to the lowest. The

result in Table 4.4 shows various factors responsible for skills shortage. These include Poor Training and Retraining, Casualization of Workers, Poor Skills Management Strategies, Poor Image of the Industry, Absence of Clear Career Path, Poor apprenticeship Schemes, Few Female Entrants, Quest for self-employment among craftsmen, Poor Funding of Vocational Centres, Dissatisfaction with Labour Union, Use of Labour Contractors, Low Wages in the Industry, Poor Work Place Safety Measures, High Skills Turnover/Mobility, Introduction of New Technologies, Very Physical Nature of Works. However, Poor Apprenticeship Schemes was ranked first by professionals in this study with mean score of 3.94 showing its significance. Furthermore, Poor Training and Retraining (Mean =3.88) and Poor Funding of Vocational Centres (Mean =3.85) were ranked second and third respectively. The least ranked were High Skills Turnover/Mobility (Mean score = 3.42), Dissatisfaction with Labour Union (Mean score = 3.24) and Introduction of New Technologies (Mean score = 3.22) which were ranked fifteenth, sixteenth and seventeenth, respectively.

In Table 4.5, craftsmen also ranked Poor Apprenticeship schemes (Mean = 3.74) and Poor Training and Retraining (Mean = 3.73) first and second respectively. The least ranked factor is Introduction of New Technologies (Mean = 2.65). Poor Apprenticeship Schemes and Poor Training and Retraining are unanimously ranked first and second important factors by professionals and craftsmen, respectively. This study realised that a lot of craftsmen gave neutral opinions. This study deduced that this could be as a result of their low literacy levels and lack of ideas on the subject matter. It can be inferred however, from the result presented in Tables 4.4 and 4.5 that Poor Apprenticeship Schemes is the most

important factor responsible for skill shortage with Mean of 3.94 and 3.74 as ranked by professionals and craftsmen, respectively.

Table 4.4: Professionals assessment of factors responsible for skills shortage

S/No	Factors responsible for skills shortage	Frequency of responses					∑f	∑fx	Mean	SD	Rank
		1	2	3	4	5					
1	Poor apprenticeship schemes	14	4	8	48	51	125	493	3.94	1.272	1st
2	Poor training and retraining	8	20	4	40	53	125	485	3.88	1.293	2nd
3	Poor funding of vocational centres	6	10	14	62	33	125	481	3.85	1.055	3rd
4	Aging Work Force	15	4	24	28	15	125	282	3.82	1.346	4th
5	Absence of clear career path	12	8	24	33	48	125	472	3.78	1.288	5th
6	Poor skills management strategies	14	8	4	69	30	125	468	3.74	1.218	6th
7	Casualisation of workers	10	10	16	57	32	125	466	3.73	1.167	7th
8	Use of labour contractors	10	8	33	29	45	125	466	3.73	1.240	8th
9	Quest for self-employment	10	18	13	49	35	125	456	3.65	1.252	9th

	among craftsmen										
10	Low wages in the industry	10	22	12	42	39	125	453	3.62	1.305	10th
11	Poor work place safety measures	12	13	14	61	25	125	449	3.59	1.199	11th
12	Few female entrants	14	14	32	15	50	125	448	3.58	1.398	12th
13	Poor Image of the Industry	12	19	24	35	35	125	437	3.50	1.305	13th
14	Physical Nature of Works	19	12	23	33	38	125	434	3.47	1.406	14th
15	High skills turnover/mobility	20	9	20	50	26	125	428	3.42	1.334	15th
16	Dissatisfaction with Labour Union	10	8	62	32	13	125	405	3.24	1.003	16th
17	Introduction of New Technologies	21	15	34	26	29	125	402	3.22	1.377	17th

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, SD = Standard deviation.

Source: Field Survey, (2017)

Table 4.5: Craftsmen's assessment of factors responsible for skills shortage.

S/No	Factors responsible for skills shortage	Frequency of responses					∑f	∑fx	Mean	SD	Rank
		1	2	3	4	5					
1	Poor apprenticeship schemes	5	3	46	29	36	119	445	3.74	1.053	1st
2	Poor training and retraining	4	11	38	26	40	119	444	3.73	1.125	2nd
3	poor Skills management strategies	1	4	58	24	32	119	439	3.69	0.937	3rd
4	Poor funding of vocational centres	4	2	52	42	19	119	427	3.59	0.896	4th
5	Low wages in the industry	2	6	56	31	24	119	426	3.58	0.925	5th
6	Poor image of the industry	7	3	68	12	29	119	410	3.45	1.071	6th
7	High skills turnover/mobility	1	0	76	30	12	119	409	3.44	0.709	7th
8	Use of labour only	0	8	71	28	12	119	401	3.37	0.758	8th

	contractor										
9	Casualization of workers	11	4	57	32	11	119	373	3.30	1.046	9th
10	Absence of clear career path	9	10	51	40	9	119	387	3.25	0.985	10th
11	Poor work place safety measures	4	22	51	28	14	119	383	3.22	0.993	11th
12	Quest for self-employment among craftsmen	2	21	58	27	11	119	381	3.20	0.898	12th
13	Physical nature of work	11	1	70	31	6	119	377	3.17	0.905	13th
14	Aging work force	5	24	58	17	15	119	370	3.11	1.007	14th
15	Dissatisfaction with labour union	3	14	74	25	3	119	368	3.09	0.725	15th
16	Few female entrants	26	16	44	10	23	119	345	2.90	1.368	16th
17	Introduction of technologies	20	25	57	11	6	119	315	2.65	1.030	17th

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, SD = Standard deviation.

Source: Field Survey (2017)

4.3 Practice of multi-skilling in the building construction Firms

Figure 4.2 and Table 4.6 show the level of practice/adoption of multi-skilling in building construction firms by professionals and craftsmen. It is observed in Figure 4.2 that 48% of professionals adopt/practice multi-skilling slightly, 8.8% do not practice/adopt multi-skilling, while 8.8% of professionals practice or adopt multi-skilling properly. This study infers that majority (48%) practice/adopt multi-skilling passively or incidentally. That is, multi-skilling is not properly deployed or implemented. Few (8.8%) of professionals in the building construction firms practice/adopt multi-skilling properly.

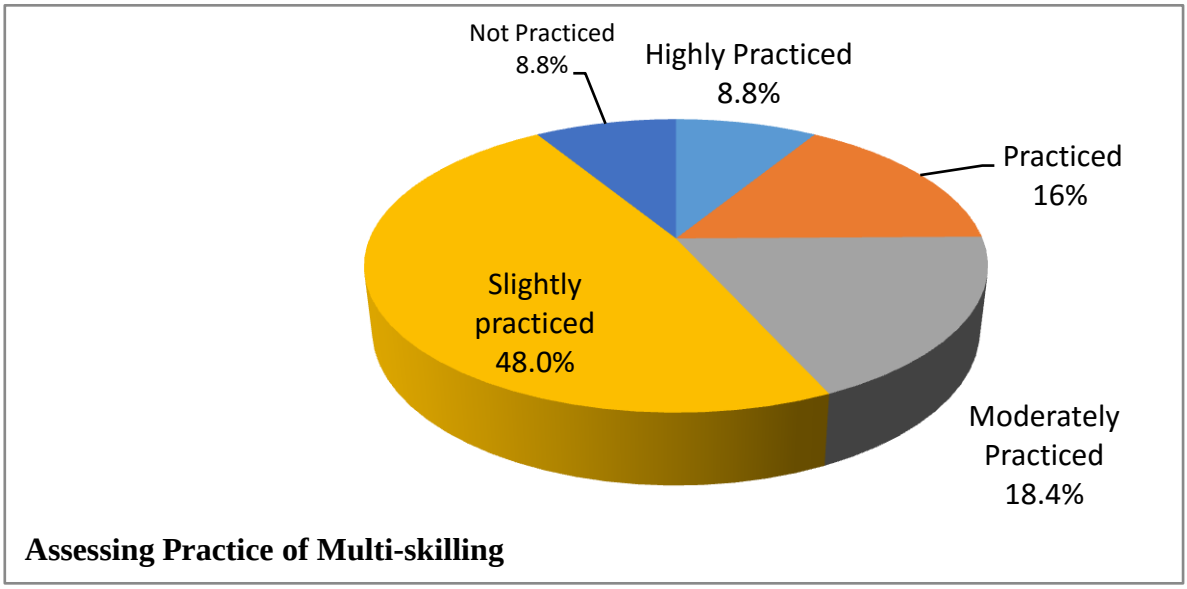

Figure 4.2: Professionals' practice of multi-skilling

Table 4.6 shows skill(s) possessed by craftsmen other than their primary competence. Skills such as masonry/bricklaying, Carpentry, plumbing, Iron fixing/bending and painting are considered in this study. Craftsmen were asked to indicate other skill(s) they possess and practice. This is to find out if they are multi-skilled. The results are presented in Table 4.6.

Table 4.6: Craftsmen's practice of multi-skilling

	Craftsmen and Number of other Skills				
Additional Skills	**Masons**	**Carpenters**	**Plumbers**	**Iron Benders**	**Painters**
Masonry	4	1	16	2	3
Carpentry	2	6	6	6	6
Plumbing	6	0	4	8	0
Iron Bending	7	0	5	1	3

Painting	1	1	1	1	1

The result of the assessment of masons shows that they possess additional skills. Plumbing skill is possessed by 16 of the masons, 4 of the masons do not possess other skills, 2 possess Iron fixing/ bending skill and 1 possess Carpentry skill. Similarly, the result of the assessment of carpenters as showed in Table 4.6, revealed that 6 of the carpenters possess do not possess other skills, 6 possess plumbing skill, 6 possess Iron fixing/bending skill and 6 carpenters also possess painting skill, while 2 possess Masonry skill. More so, 8 of the 20 Plumbers assessed additional skill of Iron fixing/bending, 6 possess additional skill of Masonry/ bricklaying and 4 do not other skills. The 25 Iron fixers/benders assessed showed that 7 possess masonry/bricklaying skill, 5 possess plumbing skill, 1 iron fixer/bender do not possess other skill and 3 possess painting skill. Finally, the result of assessment of 4 painters shows that each of them possesses Masonry/ bricklaying skill, carpentry skill, plumbing skill, Iron fixing/bending skill and 1 painter do not possess any other skill. The result presented indicates that most craftsmen possess and practice skills other than their traditional skill of competence. This study hereby infers that most of the craftsmen are multi-skilled.

4.4 Impact of the Practice of Multi-Skilling in Building Construction Firms

Tables 4.7 and 4.8 show professionals' and craftsmen' assessment of the impact of the practice of multi-skilling in the Nigeria building construction firms.

Table 4.7: Professionals' assessment of impact of the practice of multi-skilling

S/No	Impact of multi-skilling	Frequency of responses	∑f	∑fx	Mean	SD	Rank

		1	2	3	4	5					
1	Work Force Savings	12	12	10	42	49	125	479	3.83	1.306	1st
2	Time Savings	12	7	16	46	44	125	478	3.82	1.245	2nd
3	Work force development	13	4	22	40	46	125	477	3.82	1.260	3rd
4	Better Pay and Promotion	12	10	19	34	50	125	475	3.80	1.308	4th
5	Work Force Flexibility	15	6	17	40	47	125	463	3.78	1.323	5th
6	Work Force Optimisation	15	4	26	29	51	125	472	3.78	1.337	6th
7	Easy employment for craftsmen	14	11	9	54	37	125	464	3.71	1.288	7th
8	Work Force efficiency	15	7	22	37	44	125	473	3.70	1.326	8th
9	Skills Communication/Transfer	15	10	13	50	37	125	459	3.67	1.306	9th
10	Job Satisfaction	18	6	21	44	36	125	449	3.59	1.339	10th
11	Hindrance to Specialisation	20	5	24	36	40	125	446	3.57	1.393	11th

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, SD = Standard deviation

Source: Field Survey (2017)

The result presented shows that professionals ranked Work Force Saving (Mean = 3.83) first as the impact of multi-skilling on the construction industry.Time Saving (Mean = 3.82, SD=1.245) and Work force development (Mean = 3.82, SD=1.260) second and third respectively. The least ranked is Hindrance to Specialization (Mean = 3.57. Similarly, in Table 4.8, Craftsmen ranked Work Force saving (Mean = 4.13) first ahead of Better Pay and Promotion (Mean = 3.56) and Skills Communication Transfers (Mean = 3.56) which were ranked second and third respectively as the impact of multi-skilling in the building construction industry. The standard deviation values provided helps in proper rating of the

second and third impact with the same mean scores. The factor of impact with a lower value of standard deviation is rated ahead of the one with a higher value. The least ranked was Hindrance to Specialisation with mean score of 2.85. Therefore, it is inferred in this study that Work Force Saving is most important impact on multi-skilling in the building construction industry as unanimously opined by the professionals and craftsmen.

Table 4.8: Craftsmen's assessment of impact of the practice of multi-skilling

S/No	Impact of multi-skilling	Frequency of responses					∑f	∑fx	Mean	SD	Rank
		1	2	3	4	5					
1	Work Force saving	1	0	36	27	55	119	492	4.13	0.911	1st

2	Better pay and promotion	1	9	48	44	17	119	424	3.56	0.860	2nd
3	Skills communication /transfers	1	15	49	24	30	119	424	3.56	1.030	3rd
4	work force flexibility	3	10	58	21	27	119	416	3.50	1.016	4th
5	Time saving	13	13	33	26	34	119	412	3.46	1.307	5th
6	Work Force Efficiency	7	6	61	18	27	119	409	3.44	1.079	6th
7	Work force Development	1	25	34	40	19	119	408	3.43	1.022	7th
8	Work force Optimisation	1	23	58	8	29	119	398	3.34	1.077	8th
9	Job satisfaction	1	19	60	17	22	119	397	3.34	0.985	9th
10	Easy employment for craftsmen	8	21	48	9	33	119	395	3.32	1.241	10th
11	Hindrance to specialization	21	15	58	11	14	119	339	2.85	1.176	11th

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, SD = Standard deviation.

Source: Field Survey (2017)

4.5 Impediments to the practice of multi-skilling in building construction Firms

The Tables 4.9 and 4.10 show Professionals' and Craftsmen assessment of impediments to the practice of multi-skilling.

Table 4.9: Professionals' assessment of impediments to the practice of multi-skilling

S/No	Impediments to multi-skilling	Frequency of responses					∑f	∑fx	Mean	SD	Rank
		1	2	3	4	5					

1.	High Cost of Training and Retraining	17	4	22	28	54	125	473	3.78	1.389	1st
2.	Limits on Skills Retention by Workers	14	14	6	48	43	125	467	3.74	1.339	2nd
3.	Resistance to Change	16	11	6	51	41	125	465	3.72	1.348	3rd
4.	Complexity of Management	14	9	21	37	21	125	348	3.70	1.320	4th
5.	Lack of Awareness of Multi-skilling	19	14	10	44	38	125	443	3.54	1.417	5th

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, SD = Standard deviation.

Source: Field Survey (2017).

Table 4.10: Craftsmen's assessment of impediments to the practice of multi-skilling

S/No	Impediments to multi-skilling	Frequency of responses	∑f	∑fx	Mean	SD	Rank

		1	2	3	4	5					
1.	Complexity of management	1	4	71	19	24	119	418	3.51	0.882	1st
2.	Lack of awareness of multi-skilling	1	7	71	20	20	119	408	3.43	0.869	2nd
3.	High cost of training and retraining	4	10	56	30	19	119	407	3.42	0.970	3rd
	Limits on skills retention by workers	1	20	65	23	10	119	378	3.18	0.840	4th
4.	Resistance to change by workers	19	16	64	10	10	119	333	2.80	1.078	5th

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, SD = Standard deviation.

Source: Field Survey (2017)

The Tables 4.9 and 4.10 show that professionals ranked High Cost of Training and Retraining (Mean = 3.78) first while Complexity of management (Mean =3.51) was equally ranked first by the craftsmen. The least ranked by professionals and craftsmen are Lack of Awareness of Multi-skilling (Mean = 3.54) and Resistance to Change (Mean = 2.80) respectively. It can be inferred from the result that, High Cost of Training and Retraining and Complexity of management are impediments in multi-skilling.

4.6 Ways of enhancing multi-skilling in building construction Firms

Table 4.11: Professionals' assessment of ways of enhancing the practice of multi-skilling

S/No	Ways of Enhancing Multi-skilling	Frequency of responses					∑f	∑fx	Mean	SD	Rank
		1	2	3	4	5					
1	Training and Retraining of Workers	15	2	1	39	68	125	518	4.14	1.300	1st
2	Ensure Implementation Checks and Review	13	3	5	39	65	125	515	4.12	1.261	2nd
3	Educate Craftsmen on Benefits of Multi-skilling	11	8	2	39	65	125	514	4.11	1.259	3rd
4	Good Implementation Strategies	16	5	0	41	63	125	505	4.04	1.352	4th
5	Good Pay and Promotion for Craftsmen	17	3	0	45	60	125	503	4.02	1.347	5th
6	Managements' Decision to Multi-skill	15	10	5	27	68	125	498	3.98	1.414	6th
7	Craftsmen Retention	16	2	2	54	51	125	497	3.98	1.286	7th
8	Create Career Path for Multi-skilled Workers	14	6	5	44	56	125	497	3.98	1.304	8th
9	Adequate Training for Managers	19	6	1	34	65	125	495	3.96	1.450	9th
10	Workers Should Acquire Few Skills they can Retain	11	17	6	50	41	125	468	3.74	1.288	10th

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, SD = Standard deviation.

Source: Field Survey, (2017)

Table 4.12: Craftsmen's assessment of ways of the enhancing multi-skilling

S/No	ways of the enhancing	Frequency of responses	∑f	∑fx	Mean	SD	Rank

	multi-skilling	**1**	**2**	**3**	**4**	**5**					
1	Management's decision to multi-skill	1	0	49	29	40	119	464	3.90	0.906	1st
2	Adequate training for managers	1	0	46	37	35	119	462	3.88	0.865	2nd
3	Good implementation checks and review	1	0	55	33	30	119	448	3.76	0.861	3rd
4	Good pay and promotion for Craftsmen	1	6	53	27	32	119	440	3.70	0.953	4th
5	Training and re-training of Craftsmen	1	4	62	22	30	119	433	3.64	0.927	5th
6	Educate Craftsmen on benefits of multi-skilling	1	0	71	26	21	119	423	3.55	0.810	6th
7	Good Implementation strategy	10	8	35	40	26	119	421	3.54	1.156	7th
8	Craftsmen retention	1	8	63	23	24	119	418	3.51	0.919	8th
9	Workers should acquire few skills they can retain	1	12	57	29	20	119	412	3.46	0.919	9th
10	Create career path for multi-skilled workers	1	19	59	24	16	119	392	3.29	0.924	10th

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, SD = Standard deviation.

Source: Field Survey (2017)

Table 4.11 shows rankings, means, SD and frequencies of response by professionals on ways of enhancing multi-skilling. The professionals ranked Training and Retraining of Workers as the most significant way of enhancing multi-skilling with a mean of 4.14. Ensure Implementation Checks and Review and Educate Craftsmen on Benefits of Multi-skilling were ranked second and third with mean of 4.12 and mean of 4.11 respectively. The least ranked is Workers Should Acquire Few Skills they can Retain (Mean =3.74). In

Table 4.12. The Craftsmen ranked Management's Decision to Multi-skill (Mean = 3.90) as the most significant way of enhancing multi-skilling. Adequate Training for Managers (Mean = 3.88) and Good implementation checks and review (Mean = 3.76) were ranked second and third respectively. The least ranked was Create Career Path for Multi-Skilled Workers with mean of 3.29. It can be inferred from the result that, Training and Retraining of Workers and Management's decision to multi-skill contribute largely to enhancing multi-skilling in the building construction industry.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Major Findings

Major findings from the study are highlighted below.

i. In the identification of skills shortage and the factors responsible for skills shortage in the building construction firms, crafts like Masonry/bricklaying, Carpentry, Plumbing, Iron fixing/bending and painting were assessed. The result shows that 30.4% of the professionals affirmed the shortage of Masons/Bricklayers, 41.6% have neutral opinion on the shortage of carpenters that is they were not decided, 41.6% also agreed to shortage of plumbers, 35.2% disagreed on the shortage of iron benders, and while 32% agreed there is shortage of painters. Similarly, the Craftsmen interviewed admitted shortage of Masons/Bricklayers (89.1%), Carpenters (80.7%), Plumbers (59.7), painters (62.3%), while they disagreed on the shortage of Iron Benders (72.3%) in the building construction firms.

ii. In identifying the factors responsible for skill shortage in the building construction firms, the study identified several factors, such as Poor Training and Retraining, Casualization of Workers, Poor Skill Management Strategies, Poor Apprenticeship Schemes, Poor Image of the Industry etc. However, the professionals identified Poor Apprenticeship Schemes (Mean = 3.94) as the most important factor responsible for skills shortage in building construction firms while Introduction of New Technologies (Mean =3.22) was ranked the least. Similarly, the craftsmen ranked Poor Apprenticeship Scheme (Mean=3.74) first and the least ranked was Introduction of New Technologies (Mean =2.65) as factors responsible for skill shortage in building construction firms.

iii. In assessing the practice of multi-skilling, the study revealed that 48% of the professionals slightly practice (adopt) the concept. Response from craftsmen

revealed that most of them possess and practice skills other than their traditional competence.

iv. The study identified several impacts of the practice of multi-skilling in building construction firms. These included; Workforce Saving, Time Saving, Workforce Flexibility, Skills Communication/Transfer and Workforce Flexibility. The professionals and craftsmen however unanimously ranked Workforce Saving (Mean = 3.83 and Mean = 4.13) first. The least ranked by Professionals and craftsmen are Hindrance to Specialization with Mean of 3.57 and 2.85, respectively.

v. The study identified some impediments to the practice of multi-skilling in building construction firms. The professionals ranked High Cost of Training and Retraining (Mean = 3.78) first amongst all identified impediments and the craftsmen ranked Complexity of management (Mean =3.51) first. The least ranked by professionals and craftsmen are Lack of Awareness of Multi-skilling (Mean = 3.54) and Resistance to Change (Mean = 2.80), respectively.

vi. The research identified some ways of enhancing multi-skilling in building construction firms. These included; Management's Decision to Multi-skill, Adequate Training for Managers, Good Implementation Strategies etc. However, professionals ranked Training and Retraining of Workers (Mean = 4.14) first and craftsmen ranked Management's Decision to Multi-skill (Mean = 3.90) first. The least ranked by professionals and craftsmen were Workers Should Acquire Few Skills they can Retain (Mean =3.74) and Create Career Path for Multi-Skilled Workers (Mean = 3.29), respectively.

5.2 Conclusion

The following conclusions were drawn based on the findings of the study as stated earlier.

i. It is concluded that there is shortage of Masonry/bricklaying, plumbing and painting skills in the building construction firms.

ii. It is concluded that poor apprenticeship schemes is the most important (1st ranked) factor responsible for shortage of skills in building construction firms.

iii. Multi-skilling is well practiced (adopted) by few (8.8%) professionals. It is concluded in this study that multi-skilling is not properly practiced (adopted) among professionals in building construction firms.

iv. Most of the craftsmen possess and practice skills other than their traditional area of competence. It is concluded that most of them are multi-skilled.

v. Workforce Saving is the most (1st ranked) important impact of the practice of multi-skilling. It is concluded that multi-skilling can reduce number of workers required thereby ameliorating skills shortage in building construction firms.

vi. The study concluded that High Cost of Training and Retraining and Complexity of management are the major impediments to multi-skilling in the construction industry as opined by professionals and craftsmen, respectively.

vii. The study concluded that Training and Retraining of Workers, and management's decision to multi-skill are the most important ways of enhancing multi-skilling in the building construction firms

5.3 Recommendations

Based on the conclusions in this study, this research recommends as follows:

i. Building construction firms should invest more in strengthening training and skills development mechanisms, specifically good apprenticeship schemes in order to boost skills supply to the industry.

ii. Building construction firms should practice/adopt multi-skilling and take advantage of its Workforce Saving in addressing skills shortage.

iii. Building construction firms should develop sustainable multi-skilling process in order to reduce the High cost of training and retraining and Complexity of Management that is associated with the practice of multi-skilling.

5.4 Contributions to Existing Body of Knowledge

The following are the contributions to the existing body of knowledge;

i. The study identified specific skills shortage. The study had established that bricklaying, plumbing and painting skills are lacking in the building construction firms.

ii. The study identified several factors responsible for skills shortage. Based on the research findings, the research had established Poor Apprenticeship Schemes (Mean=3.94-professionals, M=3.74-craftsmen) as the main factor responsible for shortage of skills in the building construction firms.

iii. Based on the research findings, Workforce Saving is a major (M=3.83-professionals, M=4.13-craftsmen) impact of multi-skilling. The study established that multi-skilling practice can reduce number of workforce required in the building construction firms.

iv. The research has also established that High Cost of Training and Retraining (Mean-3.78-professionals) and Complexity of management (Mean=3.51-craftsmen) are impediments to the practice of multi-skilling in building construction firms.

5.5 Area for Further Study

i. This study recommends that further study should be carried out to assess crafts other than the ones considered in this study.

ii. Finally, this study recommends further study should be carried out to measure the Workforce saving benefits of multi-skilling.