**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

# Strategies for Improving Practical Knowledge of Unskilled Artisans in the Ghanaian Construction Industry: The Case of Kumasi Metropolis

By

Emmanuel Boakye (BSc. Construction Technology and Management)

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MASTER OF SCIENCE IN CONSTRUCTION MANAGEMENT

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## DECLARATION

I hereby declare that the submission is my own work towards the Master of Science in Construction Management and that, to the best of my knowledge it contains no material previously published by another person, nor material which has been accepted for the award of any degree of the University, except where duly acknowledge has been in the text.

Emmanuel Boakye (PG 5053818)

**(Student)**

**……..……..**
**Signature**

**……..**
**Date**

Certified by:

Prof. Theophilus Adjei-Kumi

**(Supervisor)**

**…….**
**Signature**

**…….**
**Date**

Certified by:

Professor Bernard K. Baiden

**(Head of Department)**

**…….**
**Signature**

**……..**
**Date**

**ABSTRACT**

The number of skilled artisans in the construction industry has been on the dwindle since the second world war. Now, the growing world population propelling the need for more infrastructure is also creating an immature imbalance between the few skilled workers available and the jobs in the market. Hence, engendering the need for more workers to become skilled or obtain the practical knowledge required to perform on the job. This study was therefore formulated to devise strategies for improving the practical knowledge of unskilled artisans in the Ghanaian construction industry by using Kumasi as a case study. Adopting the positivist approach which informs the use of case studies and surveys, the purposive and convenience sampling techniques were used to reach the target population of this study. A total of fifty-nine questionnaires were retrieved from the survey, and adopting descriptive statistics, mean score ranking and relative importance index, the several parts of the questionnaires were strategically analysed. The reliability of the scale and internal consistency of the variables were checked by using the Cronbach Alpha Coefficient test. After analysis, it was identified that all the variables obtained from literature were all necessary and could be considered as important variables for knowing the level of practical knowledge of unskilled artisans, but the first highly ranked variables under this dimension are; understanding of workers rules and obligations; ability to take measurement and understand measuring instruments, and appreciation of site health and safety. The challenges of improving the practical knowledge of unskilled artisans identified from literature was also assessed by the respondents as important challenges with inappropriate instruction skills; personal behavioural factors, and lack of availability of the requisite facilities to improve practical knowledge ranking highest among the rest. The study also identified some of the strategies for improving practical knowledge of unskilled artisans, and among the variables identified, the following ranked highest; implementing on-the-job training; making skilled artisans' jobs lucrative through better remuneration and competence-based training of workers. The key findings of the study led to understanding of how best unskilled artisans can gain practical knowledge to help fill the gap between jobs availability and availability of skilled artisans. The study finally recommended that the government should set-up training avenues, make the educational curriculum more practical and increase the attractiveness of skilled artisans' jobs in the construction industry by incorporating pension schemes, good salary and end of service benefits.

**Keywords:** Artisans, Construction, Ghana, Knowledge, Productivity, Skills

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## DEDICATION

This Thesis is dedicated to my beloved Wife Hannah Boakye and my Lovely Three Daughters,

Marian, Immaculate and Emmanuella Boakye

# CHAPTER ONE

# GENERAL INTRODUCTION

## 1.1 INTRODUCTION

This chapter begins with an overview of the Ghanaian Construction Industry by looking at strategies which could be adopted in improving the practical knowledge of unskilled artisans. The chapter act as a synopsis of the entire study and it presents the background of the study, the problem statement (showing the gap in literature which the study intends to fill), the research aim and objectives, the research questions, the scope of the study, the summary of methodology, the significance of the study and organisation of the thesis.

## 1.2 BACKGROUND OF THE STUDY

The Construction Industry (CI) is one of the major contributors to the Gross Domestic Products (GDP) of countries (Ofori, 2012). The construction industry of most countries contributes as much as 5 to 10 percent to the national Gross Domestic Product (GDP), and employs more 10 percent of the working population (Kikwasi, 2012; Lopes, 2012). With the turn of the decade after the 21$^{st}$ century, the world has become more technological and urbanized (more than 50% of the world population lives in urbanized cities) (Dirks et al., 2010; UN, Department of Economic and Social Affairs, 2014). Urbanization of cities, and its incumbent need for sustainability and the advent of technology is pressurizing the construction industry now (Chourabi et al., 2012). The industry must be more innovative, adaptive and prepared to stand up to the test of time (Cartlidge, 2011; Ashworth et al., 2013; Owusu-Manu et al., 2018). Now, providing structures to meet customers' needs is not enough. The construction industry must ensure quality, customer satisfaction, while adapting to changes in its environment, incorporating technologies and ensuring sustainability of

its practices (WCED, 1987; Hillebrandt, 2000; Hussin et al., 2013). Achieving all these divergent, but analogous aspect of the construction industry calls for a change in attitude, behavior and knowledge management of the most important resources in construction – human resources.

Human resources in the construction industry is broadly grouped into skilled and unskilled resources or labours. Interestingly, the advent of technology and the changes hitting the construction industry (introduction of Artificial Intelligence, Sensing Technologies, Virtual Reality, Robotics etc.). requires a strategic consideration of the unskilled labour force of the construction industry, so that these technologies do not come in and act as a replacement, but rather a supplement to the output or activities of the unskilled labour force. Management of knowledge has therefore become a must in the construction industry if it intends to survive or stand up to these arrived changes in the industry (Drucker, 1968).

Knowledge management became evident in research communities in the mid-1990s as a solution to the challenge of managing the intellectual assets of the global economy. According to Nonaka (1987 and 1994) and Toffler (1990) institutions should adopt strategic measures to manage knowledge to optimize the use of their resources, ability to do that would give them a competitive advantage. Knowledge management is therefore being purported in literature as the tools, techniques and methodologies used in collecting, disseminating and integrating knowledge. Most unskilled artisans in the construction industry have little or no formal educational background. Hence, depicting that, obtaining such human resources on construction sites requires continuous training in the tutelages and procedures of the several construction processes (Asfaw et al., 2015). Training is quite different from education. Adu-Gyamfi et al. (2016) avowed that the act of transferring knowledge in the form of experiences, ideas, skills, customs and values from an individual to another from generation to generation is termed as education while Hamblin (1974)

and Armstrong (2009) asserted that training means imparting the requisite skills of a specific job to a person, improving their skills and abilities in the identified area, and harnessing it through continuous development consciously or unconsciously. Therefore, improving the practical knowledge (training) of unskilled artisan is an issue of high regards for any construction industry to cater; creating the aim for this study.

### 1.3 STATEMENT OF THE PROBLEM

Until the turn of the nineteen century, handicraft industry was the order of the day. The production of diverse goods and services such as clothes, carpentry, artworks and other crafts required people with hand-on skills (Arif et al., 2018). However, the influx of industrialization coupled with the catastrophic two world wars curtailed the handicraft industry to a near zilch (CIOB, 2009).

Notwithstanding, it is irrefutable that the quality of a firm depends on the human resources it has in working towards attaining the firms' desirable objectives (Offei-Nyako et al., 2014). Iteratively, Roy and Koehn (2006) puts it bluntly that it is the employment of poor construction management skills, unskilled artisans and lack of technical knowledge for supervising mega projects which leads to the unsurmountable blunder in the construction industry i.e. high cost overruns, delays and poor quality. Therefore, a firm which seeks to attain the requisite quality, and meet clients' unwavering demands must makes sure it attains human resources who are well-skilled in its operations (Offei-Nyako et al., 2014).

However, scarcity of skilled artisan in the construction industry happens to be an old problem of the industry whose ending is not within current boundaries (Carliner, 1998). Apart from the reduction of skilled artisans by world war and industrialization (CIOB, 2009), the growing population of the world which comes with an increase in demands for housing and infrastructure

is also making the available skilled artisans small in relation to the demands for their works on the market (Chourabi et al., 2012; Seow, 2016). Notwithstanding, the increase in technology and diverse taste of clients puts the skill level of artisans in a questionable position.

This positions the notion that artisans need to be trained and provided with avenues for continuous development if they must survive the hardy blow of change and unsteady environment in the construction industry (Offei-Nyako et al., 2014). Nevertheless, GIPC (2006) opined some insightful results from their studies that 60% of the total labour force in the construction industry is made up of unskilled labourers. International Labour Organisation (ILO) (1987) study on construction manpower houses and training facilities between the years of 1960 and 1987 shows that there was a drastic decline in the number of artisans by 47.2% percent as at 1987. Akplu and Amankrah (2008) also asserted that the number of students enrolling into vocational schools has also dropped drastically by almost 4000.

The untold truth is that artisans on the Ghanaian construction market are mostly the unskilled ones, and according to (Offei-Nyako et al., 2014) the shortage of skilled artisans is affecting construction quality, cost, scope definition and proper workmanship. Hence, perpetuating the needs for the increment in artisanal numbers in the Ghanaian construction industry to help in the provision of the proper workmanship and the needed skills for projects to complete on time, at cost and meets clients differing objectives and priorities.

Since, the unskilled labourers are the lot in the industry, this study deemed it appropriate to identify strategies for improving the practical knowledge of this sect in order to attain the end goal of quality construction and increasing the skill set in the Ghanaian Construction Industry.

## 1.4 RESEARCH QUESTIONS

1. What is the practical knowledge which unskilled artisans must possess to be effective in the Ghanaian Construction Industry?
2. What are the challenging factors to improving the practical knowledge of unskilled artisans in the Ghanaian Construction Industry?
3. What strategies can be adopted for improving the practical knowledge of unskilled artisans in the Ghanaian Construction Industry?

## 1.5 AIM AND OBJECTIVES OF THE RESEARCH

This section discusses the research aim and objectives of this study.

### 1.5.1 Aim of the Research

The aim of this study was to assess strategies for improving practical knowledge of unskilled artisans in the Ghanaian Construction Industry, the case study of Kumasi metropolis.

### 1.5.2 Objectives of the Research

In achieving the aim of the study, the following objectives were advanced:

- To identify the practical knowledge required of unskilled artisans in the Ghanaian Construction Industry;
- To determine the militating factors for improving the practical knowledge of unskilled artisans in the Ghanaian Construction Industry; and
- To identify strategies for improving the practical knowledge of unskilled artisans in the Ghanaian Construction Industry.

## 1.6 SIGNIFICANCE OF THE RESEARCH

Human resources are Africa's biggest asset, and this statement is ever true for upsurge developing countries in most African countries including Ghana (UN, Department of Economics and Social Affairs, 2014). The youth population in Africa is around 226 million according to the world bank report. Channelling it to Ghana, it could be envisaged that about 59% of Ghanaian population is below 24 years and a whopping 18.6% of this number are between the green working ages of 15 and 24 years (GSS, 2014).

Irrespective of this baffling youthful populace, Ghana so as other developing countries faces militating factors in the training and equipping their youths with the skills needed for unleashing and unearthing the 21st century jobs (Arthur-Mensah and Alagaraja, 2018). With most of the youth now failing to enter the vocational training centres or further their education beyond basic education (Akplu and Amankrah, 2008), it could be appreciated that the bulk of these dropout are left unemployed or obtained to do unskilled labour jobs in the construction industry (Offei-Nyako et al., 2014).

The current shortages of skilled artisans in the Ghanaian Construction Industry present itself as a wholesome opportunity to enable firms to train some of these unskilled and unemployed youth to gain the requisite knowledge in becoming skilled for the several important areas in construction like masonry, carpentry, steel-fixing, plumbing etc., so as to provide firms with the needed workmanship and power to attain clients objectives and meet the stipulated contract duration and work within budget with quality assured (Carliner, 1998; GIPC, 2006; Offei-Nyako et al., 2014).

The significance of this study is seen in its ability to identify strategic ways which could be used in improving the practical knowledge of these unskilled artisans in the Ghanaian Construction

Industry, who for most part is the majority labour force in the industry (Akplu and Amankrah, 2008).

## 1.7 SCOPE OF THE RESEARCH

Scope of researches are in two main forms: the contextual scope and the geographical scope. In context, the study would be limited to improvement of practical knowledge of unskilled artisans. There are several forms of knowledge, practical, theoretical, conceptual, factual, procedural, etc., but this study considered only the improvement of practical knowledge of unskilled artisans in the construction industry. Moreover, in the construction industry, the study was limited to only ten purposefully chosen D1K1 construction firms in Kumasi Metropolis.

For geographical scope of this study as stated earlier, the study limited its scope to only Kumasi Metropolis. Hence, construction firms in the Kumasi Metropolis were the only firms which were considered for this study. However, there were further restrictions like construction firm class that one belongs, active participation in institutional bodies and actively working which helped in defining specifically the scope of the research for this study.

## 1.8 SUMMARY OF METHODOLOGY

The research methodology section informs on the methods to adopt, which includes the philosophy to use and reasons for choosing a particular philosophy. After careful deliberations, this study adopted the positivist approach. Saunders et al. (2009) opined that the positivist epistemology is objective in nature, hence following some law-like generalization principles, gathering data, subjecting data to hypothesis testing, and forming knowledge through aggregation of facts (Bryman and Cramer, 2005; Christou et al., 2008; Saunders et al., 2009).

Intuitively, from the philosophical stand of the study, it could be seen that the deductive research approach is best for positivism. Also, it could be appreciated that adopting case studies and surveys as the research strategy would help in achieving the objectives of this study (Collis and Hussey, 2013). Therefore, the quantitative research method was used for this study, because quantitative research approach is also objective in nature, inquire into a social or human problem, based on hypothesis testing, and employs mathematical models, theories and tools in analysing data (Creswell, 1994; Hittleman and Simon, 1997; Sarantakos, 2005).

The population of this study encompassed working professionals and highly skilled artisans in the Ghanaian Construction Industry, mainly D1K1 construction firms in the Kumasi Metropolis, whose expertise, knowledge and skills in improving practical knowledge of unskilled artisans would be sought in answering the several facets of the survey questionnaires of this study. Therefore, data for study was obtained from primary and secondary sources. Secondary information was gathered from existing literature on knowledge improvement levels of artisans, militating factors to improving practical knowledge and strategies for improving practical knowledge. Google Scholar, Emerald, KnustSpace as well as Scopus among others were the scientific search engines which was used for the study. The obtained variables from the literature review were strategically compounded into close-ended questionnaires and served to the target population in person and electronically. Chen and Jin (2013) opined that questionnaire survey is the most broadly adopted approach in quantitative research. The sampling technique which was adopted for this study was convenience sampling, but the sample frame was refined with purposive sampling technique.

The primary data retrieved from the survey were analysed using descriptive statistics (means, frequencies, and standard deviations), mean score ranking and relative importance index. The

reliability of the scale was checked by using the Cronbach's Alpha coefficient test. Software for analysis were Statistical Packages for Social Sciences (SPSS) windows version 21, Microsoft Excel 2019 and Microsoft Word 2019.

## 1.9 ORGANISATION OF THE THESIS

This thesis was arranged chronologically, following the rules and guidelines of presenting master's thesis in KNUST. Holistically, the thesis consisted of five main chapter (General Introduction, Literature Review, Research Methodology, Data Analysis and Discussion of Results, and Conclusions and Recommendations of the study). Notwithstanding, there were several subheadings under each main chapter based on how best it fits in explicating that particular chapter for easy acculturation of the concept being presented. Nevertheless, clarity was sought, and care was taken not to create several subheadings under the various headings to confuse the logic in the document. Chapter one covered the general introduction of the study, and as a general introduction, it starts with a background to the study, then the problem statement (gap in literature which this particular study intends to fill), the research aim and objectives, the research questions, significance, methodology, scope and organisation of the research. Chapter two harnessed on the literature review of the study. In chapter two the conceptual, empirical and theoretical reviews of strategies for improving practical knowledge was presented. The chapter followed suit was the Chapter three – Research Methodology; this chapter presented on the several research methods which were adopted for the study. Informing on the philosophy to use, the approach to adopt and the strategies to use for the study. The next chapter was the Chapter four (Data Analysis and Discussion of Results); this chapter considers the data which were retrieved from the survey, the tools of analysis and the discussion of the results thereof. The last chapter for this thesis was the conclusions and recommendations (Chapter Five); this chapter drawn the curtains of the study to

a close by concluding and analysing whether all the objectives of the study have been attained, making recommendations, stating the limitations and showing directions for future research in this area of study.

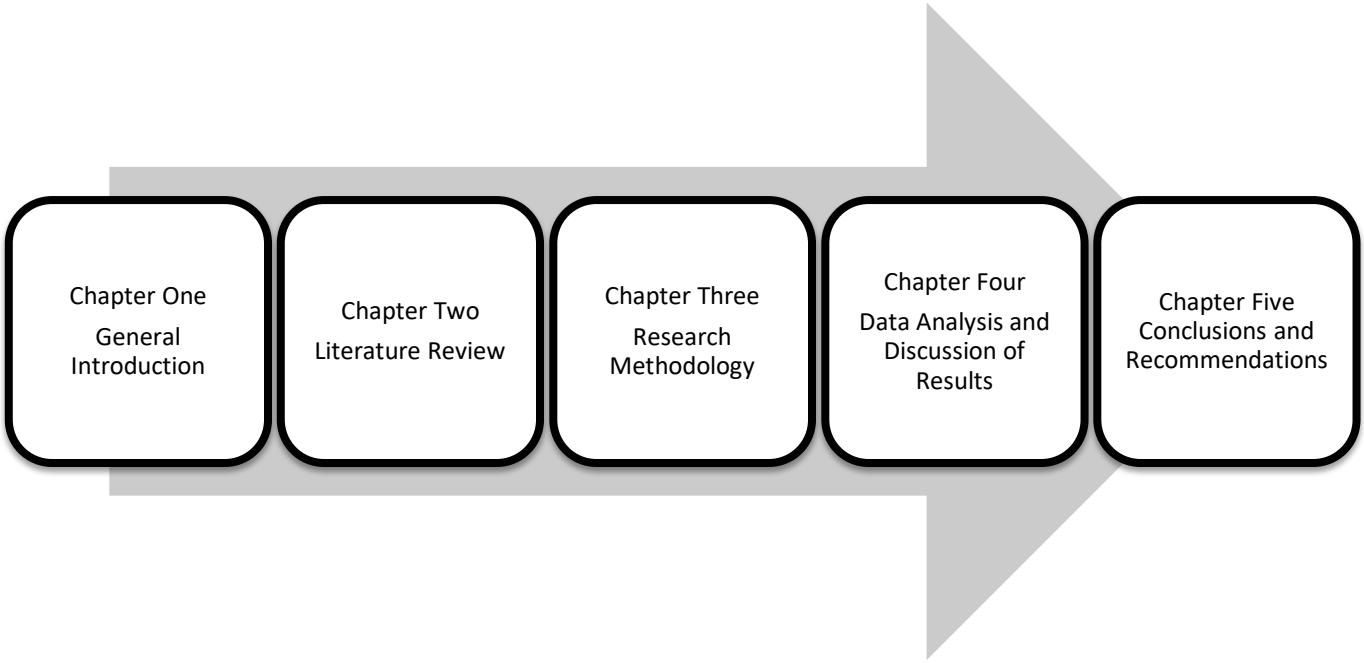


**Figure 1: Conceptual Diagram of Thesis Organisation**

Source: Author's Construct (2019)

## 1.10 SUMMARY OF CHAPTER ONE

This chapter presented a summary of the study conducted. Inferring from the organisation of thesis, the form to which the entire thesis would take is shown. Critically considering this chapter, it can be inferred that background of the study which is a summary of the literatures on the study is well presented. Also, the reasons for the study is shown, as well as the scope and methods which would

be adopted for this particular research. Moreover, the aim, objectives and research questions of the study is well-articulated in this chapter together with the statement of the problem.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 INTRODUCTION

This chapter presents on the review of literature on the core area of the study. The chapter generally hover around literature on achieving the aim and objectives of the study. In this chapter, an overview of the construction industry is presented, so as the types of knowledge and how researchers argue on the best way to improve the practical knowledge of unskilled artisans. This chapter is very important as it provides a basis for the study and makes clear how the whole study fits in a continuum of researches ongoing in this field.

## 2.2 OVERVIEW OF THE CONSTRUCTION INDUSTRY

Most industries in the world by their characteristics are very vibrant, and the construction industry is a perfect example of such industries (Chang and Chen, 2004). As a core importance to improving the gross domestic products of countries, the construction industry is a main pillar for boosting countries' economies especially developing countries like Ghana (Hussin et al., 2013). Sumanta and Enno (2006) opined that the construction industry improves development process of countries and act as a key industry which development depends on. The construction industry improves the socio-economic development of nations by providing buildings, used for production of goods and services, shelter, entertainment, and social living; as well as the provision of roads and bridges for the distribution of goods and services within and outside the country (Ofori, 2012).

Harris and McCaffer (2001) summarized the product of the construction industry as either the form of a building, civil engineering project, or engineering construction type of work. Ibrahim et al. (2010) were of the view that construction as an activity involves the use of human resources in

creating physical infrastructures and other facilities. Explicating the activities of the construction industry further, Ibrahim et al. (2010) expounded that the industry involves the erection and repair of immovable structures and components. As a global player to meeting individuals and corporate body's needs, the construction industry plays a vital role in ensuring the implementation of various development projects. Growth of countries are dependent on construction activities and its products. Ibrahim et al. (2010) stipulated some of the products of the construction industry as airports, buildings, railways, industries, commercial areas, social amenities among others.

It is of utmost important to appreciate that the construction industry seeks to meet the unending desires of its clients, and it does so by ensuring quality in its products and delivery on time and at cost. However, Offei-Nyarko et al. (2014) stated that meeting the quality needs of clients depends on the skills of its workforce. Roy and Koehn (2006) stipulated that poor quality of developing economies construction is mainly due to the use of poor construction management skills, unskilled artisans who have no practical training, and lack of proper supervision on construction sites.

The construction industry has suffered a major impact when it comes to availability of human resources after the two world wars (Offei-Nyarko et al., 2014). During the world war, normal construction activities were suspended, constrictions arose during the war, and workforce availability reduced drastically (CIOB, 2009). Carliner (1998) expounded on the issue that the skilled labour scarcity problems of the construction industry are even more profound than those of other industries. In the short-term concerns are about the availability of labour to meet market demands, but in the long term, the main problem has to do with the availability of human resources with the requisite skills and expertise to carryout construction activities of this new generation with diverse taste of priorities (Carliner, 1998).

## 2.3 THE GHANAIAN CONSTRUCTION INDUSTRY

According to Laryea (2010), Ghana is best known as an upcoming market in sub-Saharan Africa, which is mainly due to its vibrant construction industry. The construction industry of Ghana, analogous to those in other parts of the world is a key contributor to nations development and economic boosting. The Government of Ghana (GoG) is the major agent of the construction industry and it exercise its duties through the Ministry of Water Resources, Works and Housing and Ministry of Transportation (Ghana Highway Authority, 2004). In Ghana, the construction firms are classified based on their annual turnover, equipment and personnel entitled to the company amidst others. The various classifications available are D1K1, D2K2, D3K3, and D4K4.

As indicated by GOG (2012) Ghana's construction accomplished a high contribution of 15percent out of 2011 economic budget, however it could not be maintained in the consequent years. Notwithstanding, in comparison with other countries in the sub-Saharan shows that it is above average. In 2012 and 2013 Ghana`s construction GDP was 7.9 percent and 5.4 percent respectfully, demonstrating a decrease from the 2011 construction rate. As indicated by the 2014 Revised Gross Domestic Product by Ghana Statistical Service (2014), of all the industries, the Construction subsector recorded the most noteworthy contribution of 12.3 percent to the GDP, just second to the amount which the Agricultural sector gave, 15.2 percent.

Irrespective of the importance of the construction industry, it has been experiencing a trend of poor workmanship on most projects because of skills shortages (Kaoma and Muya, 2016). According to Shah and Burke (2003), there exist skill gaps when employers are hiring workers who are seen as individuals with low skills or under-skilled in relation to the needed skills. The Ghanaian

construction industry is seen to be exhibiting these skills gaps. Productivity levels are influenced by poor skills especially when under-skilled workers are used in carrying out projects instead of individuals with the requisite skills. Mojahed and Aghazadeh (2008) purported that the level of skills and experience of workers on construction site is the most important variable in ensuring productivity on construction sites.

## 2.4 HUMAN RESOURCES FOR THE CONSTRUCTION INDUSTRY

It can be argued that the main important resource in the construction industry is the human resources. The human resources are also the biggest asset of most countries especially those with a youthful population like Africa, and for that matter Ghana (Arthur-Mensah and Alagaraja, 2018). From the UN Department of Economics and Social Affairs (2014), Ghana is estimated to be about 29.5 million with more than half of her population below the ages of 24 whiles having 18.6% strategically between the ages of 18 and 24. With 71% literacy rate among the youth, and considering the demographics of the country, Ghana National Human Resource Development (NHRD) has capitalized on improving the socio-economic development of the country by prioritizing education, skills development, improving livelihood and sustaining competitiveness through training and development (NDPC, 2014).

The NHRD approach general seeks to help alleviate poverty by preparing workforce with the requisite skills and techniques for a better future. Just like other developing countries Darvas and Palmer (2014) noted that the workforce of Ghana is found within a mix dichotomy of skilled and unskilled labourers and hence, those who appreciate technological advancement on one end and

high illiteracy rate on the other end. Therefore, to attain a mix level or better workforce, Ghana must raise the level and standard of skills to ensure a sustained growth.

The issue of scarcity of skilled artisans is nothing new, as it dates back to the two world wars where normal construction activities were brought to a halt during the time of the war, and the issue of majority of the abled skilled men taken into wars cannot be overemphasized when talking about scarcity of skilled workers brought in place by the two world wars (CIOB, 2009; Offei-Nyarko et al., 2014). Skilled labour scarcity problems for contractors are more serious than those facing other employers (Carliner, 1998). The Ghana National Commission for UNESCO (GNCU) has documented that the government of Ghana is challenged to provide housing and infrastructure for the burgeoning Ghanaian population. Notwithstanding, the infrastructural needs put pressure on the output of the local construction industry which is also apparently facing insufficient skilled labour needs, equipment and lack of requisite expertise to meet the needs of clients (van Egmond and Erkelens, 2007). Moreover amidst the problems facing the Ghanaian construction industry which is resulting in lack of skilled artisans are low remuneration, the notion that these jobs should be taken up by those who cannot meet most rigorous academic requirement, poor government, lack of interest by the youth to take up trades, varying working conditions, advancement in technology and bad supervision/artisans etc. (Offei-Nyarko et al., 2014).

### 2.4.1 Skilled and Unskilled Labours in Construction Industry: the story so far

CIDB (2007) categorized the construction industry labour as skilled and unskilled based on their core duties and the expertise they bring to the work at hand. Agapiou et al. (1995) expounded that the labour-intensive nature of the construction industry, makes it to heavily rely on its workforce. Shah and Burke (2003) explained that there are some specific skills in several areas which the workforce in the construction industry must possess. Skill is defined as the ability to perform a

specific duty to a determined agreeable standard of competence (ibid). The expected standard of competency includes the ability to perform a set of tasks, the ability to understand and appreciate what others are doing and the reasons behind their actions, the cognizance to adapt to changes and unforeseen circumstances amidst others (Department of Labour, 1997).

Unskilled labour is quite informal and easy to grasp, consisting of individuals who have deficits in the needed qualifications and the requisite form of education and training (Shah and Burke, 2003). Developing countries mostly have a lot of unskilled labour as compared to skilled labour. This is as a result of several reasons such as lack of interest, low renumeration among others.

### 2.4.2 Skill Shortages and the Way Forward

Skill shortages can be viewed as the lack of continuous supply of suitable qualified workforce who are determined to work under any conditions on construction sites, irrespective of the wages available (Breier and Erasmus, 2009). Skills shortage is mostly prevalent in the construction industry, and several studies have grouped its causes into three major areas, which are contributing factors, impacts and consequential factors and methods and approaches of controlling skills shortages (Agapiou et al., 1995; Awe, 2004). The recurring nature of the construction industry is a main factor to skills shortage. The construction labour market is controlled by the abundance supply of unskilled labour and a low provision of skilled labour.

Kaoma and Muya (2016) demoed that skill shortages in the construction industry is also caused by the unavailability of trade schools in a region, low end of service benefits or payments of artisans, lack of employee benefits and poor working conditions. The effect of skill shortages leads to poor productivity on construction sites, reduced work effectiveness and efficiency. In the Ghanaian construction industry, unstable remuneration of artisans is seen as one of the major

causes of unskilled artisans (Offei-Nyarko et al., 2014). The construction industry workforce does not have well established trade unions and combined voices to establish their own basic wage (Kaoma and Muya, 2016). Basic wages of construction industry are largely dependent on the basic wage of the government to its general workforce. However, the kind of work and safety issues in the construction industry requires a new set of wages with all these variances implemented. Notwithstanding, artisans are mostly appreciative of the unfixed wages, giving them the opportunity to allure and bargain their ways through payments with clients, which in most circumstances leaves them on the low side even for the highest pay thereof considering the kind of work involved in the profession. Meanwhile, it has been stated in literature that good remuneration leads to low job turnover of highly skilled artisans (Offei-Nyarko et al., 2014). Oseghale et al. (2015) also purported that artisanal shortages occurs due to the lack of interest of young people taking up vocational training in these lots of construction artistic professions like masonry, carpentry, electricals, plumbing among others.

Wachira (2008) was of the view that one way of increasing skills in the construction industry is through training. Training equips new individuals with the requisite skills and also helps in improving the skills of already existing workforce in the effort of appreciating new technologies, ideas and innovation in a particular area of interest. Gann and Senker (1998) opined that training and development is very necessary so as to help in the reduction of unnecessary waste leading to cost overruns, unnecessary idleness leading to time overrun and unnecessary rework leading to a reduction in productivity and quality of end products. Loosemore et al. (2003) expatiated on the need for training that, whenever there are changes in job overview, availability of new roles, changes in technology and skills required on a job, need to reduce unproductive activities of workers, and ensure competitiveness, then training is required.

## 2.5 KNOWLEDGE MANAGEMENT IN CONSTRUCTION

The construction industry houses one of the most vibrant and youthful population of the world as its human resources. The United Nations Department of Economic and Social Affairs (2014) opined that the youth population of Africa is increasing exponentially. Mutamba (2014) was of the view that with the acclivitous increment in youthful population, there is the huge sense of urgency in developing the skills and knowledge required for socio-economic development.

Knowledge is defined as the amalgamation of values, information, experience, know-hows, know-whos, and know-whys or something which can help to generate revenues for the future which in itself is incorporeal (Davenport et al., 1998; Rennie, 1999). Therefore, knowledge management is being appreciated as the approach through which enhancement, development and maintenance of knowledge is possible (Kamara et al., 2002). Two main types of knowledge management exist in literature which are the process-centred knowledge management; seen as relational communication process, and product-centred knowledge management; seen as the artefacts of knowledge, thus documents, creation and reuse of knowledge in the corporate world (Mentzas, 2003).

Tserng and Lin (2004) opined that the best way to manage knowledge is to share among contemporaries in a firm or company. Experiences related to project success and failures do exist, and it is only those with knowledge in such approaches who can share it with the organisation so that the same mistakes are not repeated. To be successful in sharing knowledge, one must rely on the understanding among representative of the construction firm (Fong and Lung, 2007). Hanisch et al. (2009) expatiate knowledge management further that it involves construction representatives

adjusting past knowledge, encounters and lessons and using them to tackle new situations, difficulties and problems seen in current projects. Notwithstanding, what is mostly viewed to be the case is that experiences, know-how and know-whys of people are mostly not shared and kept in the brains of individuals during the construction period leading to repetition of similar mistakes or even adverse states of what was experienced previously. Hence, heightening the importance of knowledge management in the construction industry to help cumber the some of the effects of this approach in the industry (Gann, 2001).

## 2.6 TYPES OF KNOWLEDGE

There are several types of knowledge and its usage thereof. Polanyi (1966) framed the term tacit knowledge to mean the fact that scientist know more than they can explicate or say. The idea of knowing more forms what we mean by tacit knowledge (Sorensen and Levold, 1992). Another form of knowledge is explicit knowledge which deals with precisely and clearly making known what is known without any further additions or deliberations (Polanyi, 1966; Nonaka, 1994).

### 2.6.1 Tacit Knowledge

Tacit knowledge is sometimes referred to as the idiosyncratic knowledge, it is the type of knowledge which is in the minds of individuals (Nonaka, 2008). Tacit knowledge is difficult to define because it is based on individual's experience (Brown and Duguid, 1998), hence, for one to clearly understand tacit knowledge, one must be willing to get involved in the whole experience or processes, taking up the necessary action and becoming committed to the work at hand (Nonaka, 1994). Leonard and Sensiper (1998) opined that tacit knowledge is improved by a continuous experimentation amidst progress and several disappointments. Many organisations barely

appreciate tacit knowledge because of lack of tenacity to keep belligerence and improve knowledge (Gamble and Blackwell, 2001). Tools related to tacit knowledge includes; email, texts, groupware and other applications (Bhatt et al., 2005). Tacit knowledge has proven over the years to be the basic knowledge for use in any firm.

### 2.6.2 Explicit Knowledge

This knowledge is the direct opposite of tacit knowledge. Unlike tacit knowledge, explicit knowledge can be attained and shared through data innovation (Polanyi, 1966; Nonaka, 1994; Nonaka and Takeuchi, 1995). Botha et al. (2008) and Wellman (2009) was of the view that explicit knowledge is the type of knowledge that is easy to identify, store preferably in important structures, and recover. Examples of explicit sources where explicit knowledge can be moved to are books, databases, manual and outlines etc. This type of knowledge is very formalised and systematic (Brown and Duguid, 1998). Irrespective of the significance of explicit knowledge, researchers do not consider it to be very important on the notion that explicit knowledge cannot contain rich-field experienced and it is mostly based on know-hows which does not yield much benefits (Brown and Duguid, 1991; Williams, 1999).

### 2.6.3 Craft Knowledge

Craft knowledge can be said to be one of the oldest forms of knowledge. Since antediluvian times, the adoption of jigs, templates and other shape finding and its usage in improving the delivery of works at hands have been used to reduce risk on works and improve productivity. Through this approach risk and uncertainty has nearly become invisible but craft knowledge and experience is judge on the ability to produce a clean work without any errors (Pye, 1968). Gamble (2016) opined that craft literally means a type of work which the worker has control over from the beginning to the end. Hence, craft knowledge is mostly exhibited through the use of sketches and drawings

which shows the link between aspects of a work and how the whole work fit in a continuum of process or whole.

### 2.6.4 Formal Scientific Knowledge

Without doubt, scientific knowledge can be described in two main forms, pure and applied. Layton (1993) was of the view that the scientist goal is that knowledge is more general, and this is best shown through abstract ideas linked to experimental observation through complex logical and mathematical links. Knowledge in this state and at that level of abstraction do not mostly appear practical in real sense. Hence, for one to utilise this form of knowledge, or even if it is used at all, one must come down to the level of practicality where one can know exactly when to pause and use the knowledge acquired practically (Gamble, 2016). Though formal scientific knowledge is well-sought for in the workplace but its usage is seen as part of the general process and not explicitly seen.

### 2.6.5 How to Knowledge

This is the type of knowledge that is obtained through constantly doing a particular activity (routine). Workers who have this kind of knowledge are very experience and their work output in particular is better from years of constantly doing the same or analogous things. Regular work patterns give the foundation for this kind of knowledge with on-job training and mentoring as the approaches to learning. (Gamble, 2016). How to knowledge includes knowledge about the technical parts of job, ability to interact easily with clients, ability to work ahead of plans and under pressure as well as the characteristics of being able to manage your project very well (Mansfield and Mathews, 1985; Stewart and Sambrook, 1995).

### 2.6.6 Systems Knowledge

When how to knowledge is documented, then we have what is call system knowledge. While how to knowledge deals with specific task or work experiences, system knowledge works on a more general level, usually taking the form of general work rules or instructions documented as statements of purpose, which firms use to ensure that they attain customers' needs and provide the needed goods and services at the highest desirable quality (Stewart and Sambrook, 1995). At the international level, technical committees like the ISO create standards and quality assurance and management certification for firms at different levels who wants their clients to rest-assure that they would deliver on their quality specification. Mostly system knowledge comes in the form of manuals, or documented policies or formats requiring scientific understanding and use of theories to break them down (Gamble, 2016).

## 2.7 FORMS OF TRAINING OR RETAINING KNOWLEDGE

The basic theory underpinning this study is the Human Capacity Theory (HCT) which deals with ensuring that citizens obtain the required education and training necessary for them to be effective in their workplaces (Becker, 1975). This is because training of the youth of a country indirectly leads to training of its future which is seen in a boost of its socio-economic development. Hence, HCT produces a positive output on the workforce, firms and the community as a whole (Becker, 1975). Gray and Herr (1998) opined that there is a link between workforce and development, skilled workforce and the value it brings to improving socio-economic development, and a countries skillset depends on the knowledge of its workforce regarding occupational and intellectual reforms and skills. Blair (2011) was of the view that considering an economic perspective of training the workforce of a country, it becomes very imperative to do that since, the

constant changing working environment requires that workers are equipped with the requisite skills to enable them adopt to new modernised technologies and know-hows in their area of expertise to ensure improvement in productivity for economic development at all levels.

In the locus of things, skilled artisans in the construction industry were supposed to come from our Technical and Vocational Education and Training (TVET) institutes, where having gone through the necessary trainings, course modules and education, students should be equipped with the requisite skills needed for work on various construction sites and other industries. However, just as Oseghale et al. (2015) expressed, the rate at which the youth of the country are venturing into our training institutes is very low and unappreciable, hence diverting the onus of increasing skilled artisans to apprentice training on construction sites.

### 2.7.1 Apprenticeship

Apprenticeship is a well-known approach for training artisans in the construction industry. Gopaul (2013) opined that the word apprenticeship comes in diverse forms and used differently in different parts of the world to mean the same thing. In some countries, apprenticeship means mentoring, internship or traineeship, and mostly done between 2 to 3 years. However, proper apprenticeship in any country is regulated by law. Steedman (2012) expressed that apprentice are introduced the several aspects of the job, where skills are acquired, confidence built and ability to work in a team or independently developed. Apprentice are mostly paid wages as they go through these trainings. To ensure that artisans are able to execute project to international levels, one approach which has been proven to be very resourceful is the training of artisans through apprenticeship (Kaoma and Muya, 2016). The success in apprenticeship is quite sure because of the dual educational system which ensures that there is a collaboration between trade unions and private firms or government

(Aivazova, 2013). This approach enables the apprentice to gain exposure and deep-seated experience of what the job grounds offers (Muya et al., 2003).

### 2.7.2 Competence Based Training

This type of training cis based on well-defined sought-after standards which are expected of artisans. Anane (2013) puts it in a broader perspective as the kind of training that ensure that learners obtain the requisite knowledge, skills, attitudes and values to be effective and worthwhile in the working environment. Hence, this approach is based on the concept of skills transferability. Everhart (2014) studied into Competence Based Training (CBT) and identified similar results that most CBT programs are formulated after consultations with industry about the most needed standards and skills needed to ensure success at work. Norton (1987) postulated that CBT systems should strive to attain these five essential components; skills must be established, verified and made available in advance; the criteria for assessment should be formed and the conditions under which awards will be given should be made clear and public; instruction for the program or tutelages should be specified; assessment of competence level does not take off the learner's knowledge and attitude but the core skill being assessed here is the performance of the leaner; and learners progress through the training at reasonable pace by showing the attainment of specific competencies.

### 2.7.3 Informal Skill Training

Middleton (1991) opined that informal skill training is mostly an unplanned approach of training or learning which the individual receives on-the-job training within the context of day-to-day production activities. Loosemore et al. (2003) also stated that the informal acquisition of skills follows the approach where one imbibes the skills and knowledge needed to carry out activities without necessary following any documented instructions or approach, but merely giving the

assistance and instructions where necessary. This way of training mostly deals with initial employment training where there is limited avenue for continuing training and skill development (Middleton, 1991). Quality training is mostly appreciated in this sector if the trainee and the foreman or trainer do not have any external relationships or associations (Ogbeifun, 2011).

## 2.8 LEVEL OF PRACTICAL KNOWLEDGE REQUIRED OF UNSKILLED ARTISANS

Artisans are required to uphold some level of practical knowledge on the job at hand. Hence, in training unskilled artisans who most often have not passed through vocational training, there is a level of practical knowledge which are required of them to attain. Employers assign a high weight to the practical capabilities of artisans who are employed to perform specific tasks on the construction sites. Artisanal training should be able to lead to the development of the practical skills of artisans in ensuring consistency in standards of work executed (CIB, 1998).

Choudhry and Fang (2007) opined that an individual skill comprises of both intellects and physical skills. Wachira (2008) postulated that the requisite skills of artisans are dependent on their working conditions, the working environment, available equipment and technology, materials, methods of work and the relationship between management and workers. The changing working environment means that workers should be adaptable to change, and become more concerned horizontally about their work trades and vertically about the relationship that exist between them and management. Artisans must be competent in job organisation, occupational health and safety issues, understand and appreciate quality control and quality assurance of projects, and appreciate the principles and understand the properties of construction materials (Wall and Clarke, 1998).

Mojahed and Aghazadeh (2008) asserted that one of the most important factors for improving productivity on construction sites is the level of skills and experience of the artisans, hence, the skills exhibited by the artisanal workforce can either make or unmake projects desirable objectives. The expert skills of artisans improve both the intellectual and physical abilities on construction sites which leads to an increase in productivity (Kaoma and Muya, 2016). Artisans should be equipped with critical skills such as problem-solving ability, language expression, ability to read measurements, appreciation of the occupational skills and health and safety issues amidst others.

## 2.9 CHALLENGES FOR IMPROVING PRACTICAL KNOWLEDGE OF UNSKILLED ARTISANS

Artisanal shortages have been an issue ever since the two world wars (CIDB, 2007; Offei-Nyarko et al., 2014), despite several policies by governments to improve on the skill set in various countries, the construction industry still have a lot of its workforce unskilled and without the rudimentary knowledge in understanding the nexuses of construction activities (Almeid and Faria, 2014; Windapo, 2016). Artisanal shortages exist in the construction industry merely due to inability of the available workforce to meet the increment in construction activities, which is brought by an ever-acclivitous world population and needs of people for shelter and basic amenities (CIDB, 2007). However, the unskilled workforces of the construction industry are mostly individual who have little or no formal education, and finds it difficult to appreciate the basic sciences and knowledge in the construction craft.

Notwithstanding, to ensure increment in production and meeting the technological advance taste of current generation clients, it becomes expedient to ensure that the unskilled workforces are at

least given some training to enable them fit in the wad activities of the construction industry, work easily in teams and exhibit basic skills in appreciating and understanding current innovation and technologies in the construction industry.

Several training models or approaches have been developed to ensure that individuals with no or little formal education are able to equip themselves with basic understanding of things. For instance, Apprenticeship Skill Flow Chart Model (ASFM) However, irrespective of all these developed models and approaches, challenges to ensuring the improvement of practical knowledge of unskilled artisans persist. These challenges are broadly explored in two areas: the attitudinal barriers of the artisans and the haywire of developed policies, models and approaches. Randeree and Chaudhary (2007) expounded some of the challenges as workplace flexibility, team work, the agency to work with, job security, supervisory support, communication, working conditions, job importance among others.

Poor remuneration is one of the main challenges of the availability of skilled artisans in the Ghanaian Construction Industry (Offei-Nyarko et al., 2014), and it is still a challenge to improving the practical knowledge of unskilled artisans since the issue has not been resolved yet. Without any approved recognised remuneration, artisans would not stay on the job or one firm for a long time, and would chase one site to another in search of a place which would pay well for their hard-earned trained skills (Kaoma and Muya, 2016). Also, Oseghale et al. (2015) reduction in the training modules or time of craft persons is one of the main challenges causing artisanal shortages and lack of practical skills on construction sites.

Job satisfaction is seen as an approach to which a worker would develop either positive or negative attitudes towards a job (Odom et al., 1990). The skilled artisanal jobs do not mostly come with

social security and other important facets of white-collar jobs making it lose it flavour and attractiveness (Arthur-Mensah and Alagaraja, 2018). Most managers today are unable to keep their workforce motivated in order to draw the best performance from them (Anin et al., 2015).

## 2.10 STRATEGIES FOR IMPROVING PRACTICAL KNOWLEDGE

Improving the practical knowledge of unskilled artisans involves several important processes. This consists of hard and soft structures and getting the needed information readily available. Hard structures involve the availability of learning areas, environment and tools to ensure that effective training is done while soft structures involves the availability of experts and individuals with the requisite skills to transfer knowledge to the unskilled labour workforce. However, irrespective of how fully equipped hard structures are, or how well experienced and of high quality the soft structures are, the unskilled workforce would still need reasons to partake in ensuring that there is improvement in their skills. Hence, a well-thought strategy would be needed to be formulated to lure the unskilled artisans to avail themselves to learning and training to enable them acquire standard skills needed in on the job. These strategies together with measures to ensure the availability of soft and hard structures combines to make the strategies needed to improve the practical knowledge of unskilled artisans.

Considering the field of Human Resource Development (HRD), McGuire et al. (2007) postulated that one should not only focus on economic gains for improving knowledge, but rather consider societal development that could bring economic benefits. Therefore, government involvement is needed in ensuring that artisans are upgraded to obtain the requisite skills needed on the workplace as such approach leads to increment in socio-economic development (Wachira, 2010; Blair, 2011).

Baek and Kim (2014) assayed that improvement governmental policies that are comprehensive and could enable a macro-system approach to development is very important. In its natural sense, this include developing collaboration between international organisations, NGOs and other institutions outside organisation for easy transfer of knowledge or technology (Arthur-Mensah and Alagaraja, 2018). To improve practical knowledge of artisans on construction sites, training and good management practices are some of the innovative tools to adopt (Kaoma and Muya, 2016).

Motivation is not always in the form of giving gifts or awards, but it comes in several arrays. Bowen et al. (2008) opined that motivation in the form of been part of decision making, recognition for contribution to work objectives, undertaking challenging and worthwhile tasks, being creative on the job, as well as receiving recognition for work done over normal responsibilities are all forms which should be encouraged. The success in ensuring that workers stay glued to training and achieving the required practicality is affected by the environmental conditions and behaviour of managers on construction sites (Anin et al., 2015).

A gateway to ensuring that workers productivity improves is through the use of an improved toolkit. An improved toolkit makes available better technology for artisans. When artisans access a better technology, it enables them to improve their productivity, harness quality and increase their range of deliveries. In the long run, leading to an increase in human capital formation in the construction industry (Banik and Bhaumik, 2005). Artisans are to be provided with improved hand-tools or power-driven tools depending on their profession, which should be of highest quality with the latest technological software or design. Such approach would prepare artisans for the workplace and they would be ready for any changes in technology or eventualities during their work life phases (GoI, 2000). Kamaruddeen et al. (2013) postulated that good management and supervision are very essential for high level performance and increasing practicality of sites.

Ghana has been practicing free basic education for a long time now, with the recent implementation of free senior high school. The implementation of these free education follows in line with UNESCO objective of Education for All (Arthur-Mensah and Alagaraja, 2018). However, it is only recently that is was recorded that the number of enrolments in basic education among the Ghanaian youth reached 91% (UNESCO – UNEVOC, 2015). Notwithstanding, the basic education of the youth are ingrained with some technical skills in carpentry, masonry, and other basic training to provide basic skills as an intervention in case students are not able to continue after basic school, and approach formulated by the National Vocational Training Institute (NVTI). Curriculums in senior high schools should formulated to provide students with pre-vocational basis for vocational training with high integrated social and educational values (Osei, 2004). Moreover, several policies have been formulated to help improve the vocational and technical training of the youth of Ghana for instance, the creation of the Council for Technical and Vocational Education and Training (COTVET) to coordinate and direct all aspects of technical and vocational education in the country is a huge step toward improving practical knowledge from the government side (Arhtur-Mensah and Alagaraja, 2018).

## 2.11 CHAPTER SUMMARY

This chapter considered the literature surrounding the study. Thus, strategies for improving the practical knowledge of unskilled artisans in the Ghanaian Construction Industry. The empirical review, conceptual review and theoretical review surrounding how the literature of practical knowledge of expatiated in detail above. In the literature review also, review is made on the challenges of improving the practical knowledge of artisans as well as strategies to ensure that the

practical knowledge of artisans are improved. Also, the level of practical knowledge expected of unskilled artisans is also stipulated in this section of the study.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 INTRODUCTION

This section of the study basically discusses the research methods available and reasons for selecting a research approach for this study. The methods adopted for any study should be such that it would help the researcher answer the research questions with the aim of achieving the purpose of the research. In summary, this chapter presents on the research philosophy, thus, where the study cut across in the philosophical stand of either epistemology, ontology or axiology. The research approach which would be either deductive or inductive reasoning, the research strategies which could either be quantitative, qualitative or both, the research design, time horizons, unit of analysis and data collection methods i.e. interviews or questionnaires. This chapter also provides information on the sampling technique adopted, sampling frame, sample size and population of the study, and it concludes with the tools which would be adopted in analysing the responses from the survey.

## 3.3 RESEARCH APPROACHES

Research Approach deals with the stepwise way and plans used for a research from one stage to the other until the study aim is achieved (Creswell, 2013). The research philosophy chosen affects the research approach used for any study (Creswell, 2009). Kwofie (2015) asserted that the research approach provides an avenue to propose a general view of the research problem while providing answers to the research questions. There are two key areas in research approaches, which are the deductive and inductive research approach. Easterby-Smith et al. (2008) opined three main

reasons which influences a research approach. They are the research design, research strategy used and the knowledge in the several research methods available to conduct the study.

Deductive reasoning basically deals with existing theories that have been generally been used or ideas about a subject by identifying the theory and testing through observations to confirm the theory (Ofori-Kuragu, 2013). The deductive approach mostly consists of a top-down approach in the creation of the theory and testing of hypothesis while maintain the independence of the researcher (Antwi-Afari, 2019). Hence, the process starts from the identification of the relevant theories and the adoption of scientific study through observations to confirm these theories. Kwofie (2015) added on that, the deductive approach to research is more concerned with fining out patterns through observation to confirm the actual occurrence of the patterns from general to specific. This approach mostly adopts quantitative methods for data collection and analysis.

Inductive reasoning is used mainly in formulating theories, and it starts with the study of specific instances of societal issues through the identification and development of patterns from the analysis of data obtained (Ofori-Kuragu, 2013). In inductive, adopting the qualitative methods in its data collection and analysis means it is subjective in nature (Antwi-Afari, 2019). In developing theories using inductive approach, it can be said to be one that helps in gaining more understanding of the problem of society such that the researcher is part of the survey (Saunders et al., 2009). The research approach adopted for this study is that of deductive reasoning because the aim of this study and its strategic objectives can easily be attained find patterns through observation to confirm a reality (Kwofie, 2015). Hence, deductive approach is the best for this study.

## 3.4 RESEARCH STRATEGIES

The research strategy is very important part of all the research philosophy approach (Pathirage et al., 2005). Guba and Licoln (1994) asserted that the research strategy mainly involves two key areas (quantitative and qualitative). Baiden (2006) opined that research strategy consists of three diverse areas, thus, quantitative, qualitative and triangulation whose reasons for picking any depends on the purpose of the study, the research questions and the ease of obtaining data (Naoum, 2012).

Qualitative research mostly takes place in a naturalistic setting; thus, it tends to consider the quotidian activities of people and groups of communities (Antwi-Afari, 2019). Denzin and Lincoln (2003) assayed that the qualitative research involves a naturalistic approach, understanding the subject matter; looking at interpreting or making sense of issues, by considering the meaning which people attach to them. Creswell (2003) opined that this research consisst of different knowledge claims, several methods for collecting data and diverse enquiry initiatives could be employed. Sources of data for a qualitative research includes case studies, interviews, questionnaires, documents, researcher's impressions and responses (Bryman, 2004).

Quantitative research approach enables the investigation of quantitative properties and their relationship systematically (Wadsworth, 1997). Creswell (1994) opined that this approach considers past actions, words, or records with a statistical significance, and determines the findings of these observations. The objective of this approach is simple; how do we employ mathematical models, theories and hypothesis concerning a natural phenomenon (Sarantakos, 2005). Sources of data collection are mostly questionnaires, surveys and experiments using mathematical tools in analysing them (Hittleman and Simon, 1997). This study adopted the quantitative research strategy because it adopted variables on a subject and by adopting some tools like descriptive statistics

(mean, standard deviations, frequencies etc.) to determine the differences between the various variables.

### 3.5 RESEARCH DESIGN

The research design fall under the three main research strategies. Baiden (2006) opined that the research design could either be experiment or surveys (quantitative); case study, action research, grounded theory, ethnography etc (qualitative) or convergent, transformative, explanatory or exploratory sequential etc. (mixed method).

As a research style, most scientific or natural researches and some few of psychological social researches adopts the experiment research approach to determine casuality between two variables through exploratory and explanatory mode to answer the why and how questions (Saunders et al., 2009). In experiment research, we mostly look for treatment for a phenomenon which is expected to be one variable, by keeping the control factors for the other variables and measuring the outcome of both variables. While experiments undertaken in the natural sciences are mostly done in a controlled laboratory, those in the social sciences are done in open fields (Owusu-Manu et al., 2012).

Surveys are adopted as tools for collecting large number of quantitative data for exploratory and descriptive research through the use of standardised questionnaires (Saunders et al., 2009) and structured interviews with the aim of generalising from sample to population using statistical analysis (Creswell, 2009). Case studies are for empirical or exploratory investigations where the researcher has to do an in-depth analysis. It is mostly employed within a context of existence, and its purpose is for gaining rich understanding of such existence (Baiden, 2006; Saunders et al., 2009). Yin (2003) opinionated that case studies are forms of empirical enquiry in which one looks

into a contemporary phenomenon within its real-life context, especially where the boundaries between the phenomenon and context are not very clear. This study adopted the survey and case study research designs which helps in machinating and achieving the objectives of the study. Strategies for improving the practical knowledge of unskilled artisans could easily be achieved through the use of standardised questionnaires and taking out some few specialised construction firms as real-life experience case studies.

### 3.5.1 Unit of Analysis

To ensure that the study easily identifies or obtain the best result from the data collection method, the researcher must first identify the unit of analysis (Sekram, 2003). Unit of analysis are grouped into five main types; individual, dyads, groups, organisation and culture. Considering the purpose of this study, the organisation unit of analysis was chosen. Notwithstanding, it must be appreciated that primary data was obtained individuals in these organisations who are experts and representative of the organisations understudy. Speer (2002) opined that the unit of analysis is chosen by the research is also affected by the environment where the researcher operates. This study adopted the field survey or it is influenced by the natural environment.

### 3.5.2 Time Horizons

In research there are two main time horizons, the longitudinal and cross-sectional time frame (Saunders et al., 2007; Bryman, 2012). Saunders et al. (2007) stated emphatically that the research approach or methodology adopted for a particular study does not influence or determines the time horizon which the study must adopt. The longitudinal time frame considers obtaining data repeatedly over a period of time. This is mostly adopted when one needs to study a particular changing variable to enable the researcher to get the actual results and changing patterns and how that could influence the study (Goddard and Melville, 2004). This study adopted the cross-

sectional time horizon, the cross-sectional time horizon is also known as the snapshot time framework. Mostly employed when the study is already established and what is left is for the research to collect data at a particular point in time (Flick, 2015). Hence, it is usually adopted when one needs to provide data to easily prove or debunk an already existing theory identified or formed from literature. It is one time (not recurring at several points in time) and done and completed within a specific timeframe (Antwi-Afari, 2019).

### 3.6 DATA COLLECTION METHODS

Tongoco (2007) was of the view that a good data should be collected from the onset, because no amount of calculation can atone for the collection of a poor data for analysis. This is because the data collection methods adopted for a study influences the attainment of the research objectives and purpose of the study.

Sources of data are mostly either primary or secondary. This study adopted only primary sources of data which mostly employs the use of survey questionnaires as the tool for data collection. Secondary information for the study was obtained from doing in-depth desk literature review and identifying important variable which could help in determining strategies for improving the practical knowledge of unskilled artisans in the Ghanaian Construction Industry. The variables obtained from literature were strategically compounded into close-ended questionnaires which were distributed to the target population of the study to help in meeting the objectives of the research. For quantitative research there are two main types of data; categorical and numerical data (Saunders et al., 2009). This study adopted both forms of data in its analysis.

Survey questionnaires were used as the tool for data collection because of the quantitative research approach which this study adopted (Sarantakos, 2005). Questionnaire are mostly in two forms,

open-ended and close-ended questionnaires. Questionnaires are formed in such a way so as to answer the objectives of the study (Oppenheim, 1996). A good questionnaire would be unique and contribute to generating several kinds of information from the respondents (Gall et al., 2003). Questionnaires should be clear, concise and precise without the use of jargons or field abbreviations for easy understanding and answering by your target population.

Piloting of the questionnaires were done before the main survey. Yin (2009) opined that pre-testing of questionnaires could go a long way of enabling the researcher to understand how the variables identified generally answer and enables in obtaining the research objective and how the target population understands the questions being asked. Lietz (2010) said that pre-testing of questionnaires is very important in obtaining reliable and valid data, it also creates room for correction of any ambiguity in the questions asked.

### 3.7 POPULATION AND SAMPLE FRAME

Naoum (2012) opined that the population of a study consists of all the possible prospects who falls under the study who are supposed to give or required to be assessed to help in obtaining the purpose of the study. The population of this study consists of professionals, and highly skilled artisans of D1K1 registered construction firms who are in good standing. Kothari (2004) defined a sample frame to consist of a list of items from which the study sample is to be taken. Ritchie et al. (2013) was of the view that for any study the researcher can identify the sample frame specifically to the study or it could be obtained from secondary information. Henry (1990) was of the view that surveying the whole population mostly becomes difficult financially and technically, hence obtaining a subset of the general population under investigation and using it to acquire information on the entire population should be adopted.

## 3.8 SAMPLING TECHNIQUE AND SAMPLE SIZE

After identifying the population of the study, the next step is to use a sampling technique to choose some sample out of the population of the study. Sampling techniques are usually grouped into two main categories, thus, probability sampling and non-probability sampling techniques (Saunders et al., 2009). Probability sampling techniques are those cases whereby each individual in the population has an equal chance of being selected. It is mostly used the population of the study is known. Bryman (2004) postulated that the probability sampling technique helps in easily calculating the confidence interval and margin of errors on the study. Examples of such techniques are stratified random sampling, multi-stage random sampling, simple random sampling, cluster sampling and systematic sampling.

Non-probability sampling techniques are those cases whereby it is impossible for each individual in the population to have an equal chance to be selected. Non-probability sampling technique does not give the opportunity to calculate for confidence interval and margin of errors, but approach appears very easy and cost-effective (Bryman, 2004). Examples are: quota sampling, convenience sampling, purposive sampling, self-selection sampling and snowball sampling (Saunders et al., 2009). This study therefore adopted the purposive and convenience sampling techniques.

### 3.8.1 Purposive and Convenience Sampling Techniques

Purposive sampling techniques relies on the judgement of the researcher in selecting the group, class or organisation which is to be studied. Hence, it can be called the selective, subjective or judgemental sampling technique (Saunders et al., 2009). In purposive sampling technique, based on the specific goal of the researcher and the purpose in mind, there are several examples to choose from like the expert sampling, case sampling, total population sampling and homogenous sampling among others (Saunders et al., 2009). This study adopted the case sampling type of purposive

sampling technique to select ten D1K1 construction firms in Kumasi metropolis as case studies. These ten firms were chosen based on the following criteria; that they should have experts who understand how knowledge is transferred; they should have highly skilled artisans (those who have normally graduated from training institutions and have worked on field more than ten years); they should have knowledge in how practical knowledge should be improved. As a caveat also, convenience sampling was attached to limit the locus of assessment to those who appears by within the researcher's area of study (to cut down cost and time of travelling and collecting data) by sheer coincidence or a mere happenstance.

### 3.8.2 Determination of Sample Size

After determining the sampling technique for the study, the next focus is to try and find out the sample size for the study. It must be reiterated that the study adopted a non-probability sampling technique in determining the sample from the population. Cochran (1977) opined that in determining the sample size for an unknown population, some few important things must be considered such as; the level of precision and desired level of confidence. However, these determinants are mostly for probability sampling techniques. For purposive sampling technique, sample size is determined from the field survey. From our identified selected ten D1K1 construction firms, it can be proposed than the study can obtain at least ten respondents from each firm. Therefore, by calculation, the sampling size for this study can be considered to be100. However, it must be noted that after obtaining our sample size from the field survey, the researcher can now determine the confidence level and margin of error with reasons for further analysis.

## 3.9 DATA PROCESSING AND ANALYSIS

To answer the research questions which will lead to answering and achieving the aim of the study, the data obtained from the survey is analysed (Saunders et al., 2009). Kwofie (2015) was of the

view that this approach generally leads to how the obtained data would be organised, examined, categorized, tabulated, interpreted and tested. Mostly normally distributed data uses parametric tests while the non-normally distributed data adopts the non-parametric tests (Saunders et al., 2009).

In order to get quality data which would show a generalisation of the entire population, Yin (2003) was of the view that data obtained from surveys should be sorted and organised first, by so doing making sure no incomplete questionnaire is finally added and taking note of all missing values. Afterwards, the obtained data which is good for further analysis is being coded into Statistical Package for Social Science (SPSS) windows version 21. The results from the SPSS is meaningfully presented to audience as findings of the study in forms of tables and figures (Kapadia-Kundu and Dyalchand, 2007; Carpiro et al., 2007). Tables and figures have been tagged as a useful way of presenting large quantity text in simplified forms for easy understanding. UN (2009) was of the view that all tables should contain at least these five main criteria in presenting their findings to the respondents; the table title, column headers, row stubs, footnotes and source line.

The Relative Importance Index (RII) was used as the tool of analysis. RII was proposed by Soofi et al. (2000) as a tool for determining the relative significance of quantities through the formulation of indexes from which the various characteristics are ranked (hence, understanding the contribution of each variable to a response variable). Kapadia-Kundu and Dyalchand (2007) opined that using a five-point Likert scale is very good in measuring statement which would be solved using the RII tool. Hence, this study adopted a similar approach in the questionnaire formation. RII has been used in several scientific research (see for example Johnson, 2000; Jeyamathan and Rameezdeen, 2006l Antwi-Afari et al., 2018; Owusu-Manu et al., 2018; Antwi-Afari, 2019 etc.). One major reason for using RII is the avowal of Capiro et al. (2007) who opined

that RII is best for group of variables, and the questionnaires of this study was formulated as such (see Appendix). RII is calculated as RII = $\frac{\sum W}{A*N}$ where $W$ is the weight given to each factor by respondent ranging from 1 – 5, N is the total number of respondents, and A is the highest response integer (5 in this case).

### 3.10 CHAPTER SUMMARY

This chapter presented on the research methodology for this study. In this chapter effort was made to position the study along a particular line of research approach. The deductive research approach was chosen which informs the use of quantitative research strategy. The population of the study was considered as senior artisans, construction mangers and experts in D1K1 construction firms in Ghana. The tool for data collection was questionnaires. Relative Importance Index, Mean Score Ranking and One-Sample t-test were considered as the tools for analysis. The software adopted for the study are Microsoft Excel, Word, and Statistical Package for Social Sciences windows version 21.

# CHAPTER FOUR

# DATA ANALYSIS AND DISCUSSION OF RESULTS

## 4.1 INTRODUCTION

This chapter talks about the data obtained from the field survey, and the discussions of the analysis of the findings from the tools used for the analysis. Thus, supporting findings from the survey with literature and showing how it fits into the continuum of researches in the area of improving practical knowledge. After contacting ten D1K1 construction firms in the Kumasi Metropolis by using the purposive and convenience sampling techniques and obtaining an average of at least five responses from each firm, 59 research questionnaires were retrieved from an expected total of 100. Hence, representing a response rate of 59%. This response rate was considered as appropriate because according to the avowal of Moser and Kalton (1979), the results of a survey could be considered as insufficient and biased if the return rate is lower than 30 – 40% of the expected amount or sample size. The reliability of the scale was checked by using Cronbach's Alpha Coefficient test. Howland and Wedman (2004) asserted that the Cronbach's Alpha Coefficient value of 0.700 or more should be considered to depict a high reliability of the scale used for the study. After checking the reliability of the scale, several tools like tables and figures; descriptive statistics (mean, frequencies, standard deviation and standard error mean) were used to analysed the study. Relative importance Index and Mean Score Ranking were adopted for analysing the section B of the research questionnaires of this study.

## 4.2 DESCRIPTIVE ANALYSIS OF RESPONDENTS BACKGROUND INFORMATION

This section was mainly provided as part of the questionnaire to help validate the responses and acts as a check on the respondents of the survey. The data obtained for this study were primary data which was principally obtained from the questionnaires distributed to the target population of the study. The demographic analysis or background information of the respondents are analysed in the sections following.

### 4.2.1 Profession

In order to validate the respondents of the survey, this question was provided in the demographic for the respondents to show their current profession in the Ghanaian Construction Industry. The importance of this variable is that it could help in understanding the several professions which the core of this study considered and their opinion relating to improving practical knowledge, challenges to improving practical knowledge and strategies for improving practical knowledge of unskilled artisans which would become a surety for further discussion based on the respondents' professional background.

From Figure 4.1, it can be deduced that out of the 59 questionnaires which were retrieved and tagged as sufficient enough for further analysis, six of these respondents were site supervisors or site engineers, nine of the respondents were service engineers, seventeen of the respondents reported to be quantity surveyors while a whooping number of twenty-seven of the respondents identify themselves as project managers. This analysis shows that the idea obtain from the survey is mainly the influence of project managers and quantity surveyors who took a large portion of the whole questionnaire analysed.

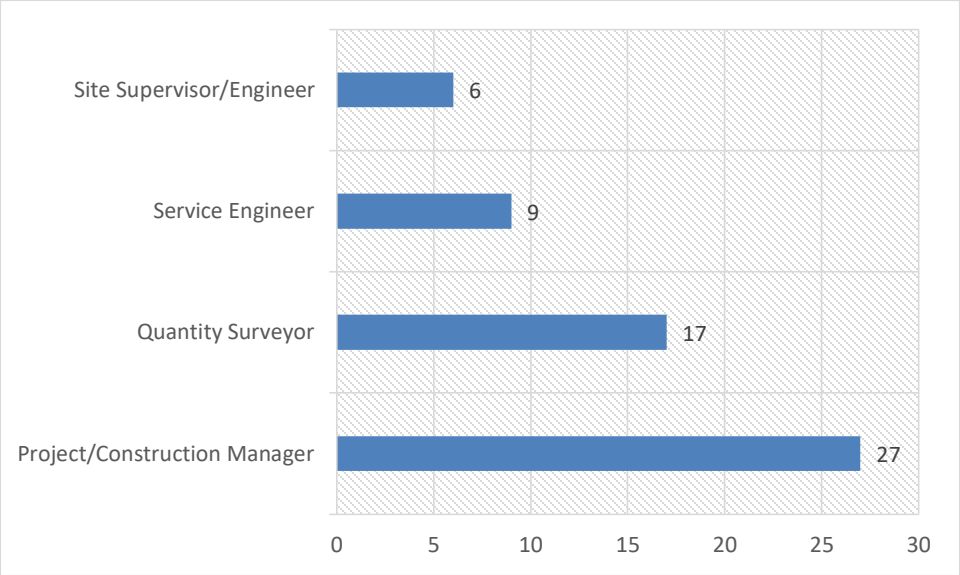


**Figure 4.1:** Current Profession in the Construction Industry

Source: Field Survey (2019)

### 4.2.2 Experience

Professional experience on a job is a must attribute which cannot be overrated. Hence, an individual with on the job experience could be seen to have appreciated several facets of the job and circumstances which would have sharpened the individual's thoughts and approach to problems. The respondents were asked to indicate their level of experience in their current position, thus, how long have they been working at the job position they identify themselves with. The important of this question would help in understanding the analysis of the data as one which is coming from a younger generation but full of a new perspective of approaching situations or one coming from experienced older generation who understand the system of things.

From Figure 4.2, it could be seen that majority of the respondents were within the 6 – 10 years' experience range, while 24% of such respondents were novice or just entered the industry (1 – 5 years of experience). A much of 20% of the respondents were also between the experience range of 11 – 15 years, while only 9% of the respondent were between the range of 16 – 20 years of

experience. It can further be deduced by summation that the percentage of respondent having more than 5 years' experience is 76%. Hence, this study was answered by highly experienced project managers, quantity surveyors, site supervisors and service engineers.

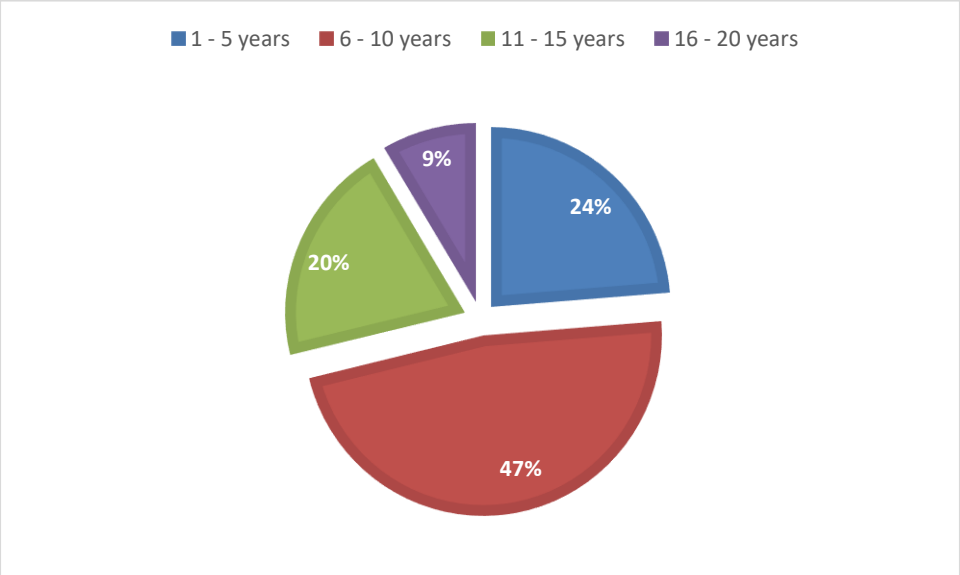


**Figure 4.2:** Experience of Respondents at Current Job Position
Source: Field Survey (2019)

### 4.2.3 Educational Qualification

In as much as we are confident of the experience of the respondents as been very satisfactorily, it still becomes very expedient and interesting if the study is able to also identify the level of education or qualification of the respondents. Hence, this variable was added to demographic to find out what kind of educational background do these experienced respondents have. Hence, also validating the responses which would be obtained from literature as coming from educated experienced professional which would go a long way in validating the responses for scholarship and policy implementation.

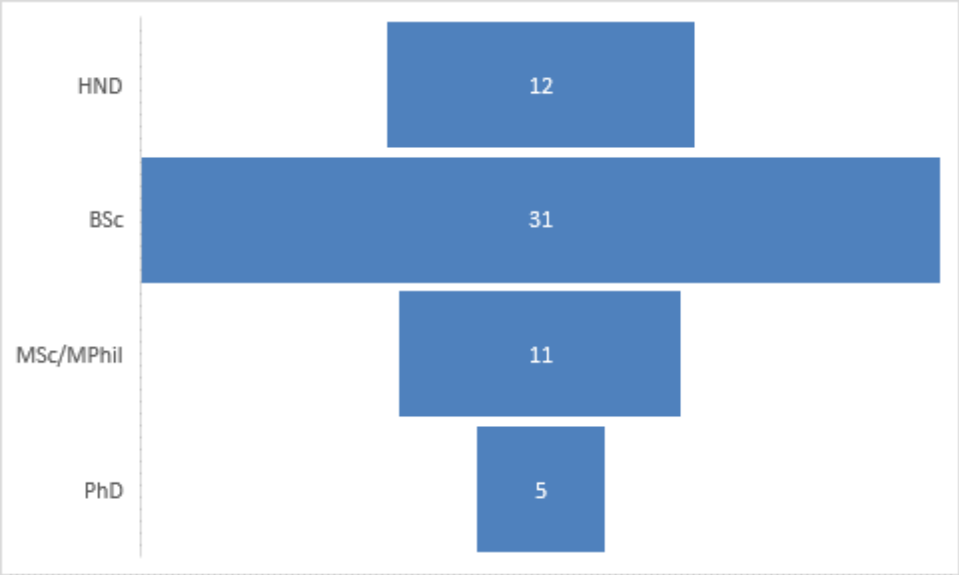


**Figure 4.3:** Level of Education or Qualification
Source: Field Survey (2019)

Deducing from Figure 4.3, it could be appreciated that twelve of the respondents have at least an HND degree, while a majority of the respondents (thirty-one) have a first degree (BSc.). Eleven of the respondents had second degrees (MSc or MPhil) while only five have their PhDs. This shows that the study was basically obtained from well-educated elites and experienced professionals in the Ghanaian Construction Industry.

### 4.2.4 Professional Body

One key criterion which is of utmost important is the ability to join professional associations of one's profession. Hence, it becomes imperative to know if the respondents are part of any of the professional associations in the Ghanaian Construction Industry (GCI).

**Table 4.1: Professional Bodies of the Respondents**

| | Responses | | Percent of Cases |
|---|---|---|---|
| | N | Percent | |
| GIOC | 43 | 31.2% | 72.9% |
| GhIS | 34 | 24.6% | 57.6% |
| PMI | 32 | 23.2% | 54.2% |
| IET | 23 | 16.7% | 39.0% |
| AGCA | 6 | 4.3% | 10.2% |
| | 138 | 100.0% | 233.9% |

Source: Field Survey (2019)

Deducing from table 4.1, it could be seen that majority of the respondents were part of the Ghana Institute of Construction while a major of the respondents were also part of Ghana Institution of Surveyors and Project Management Institute. Only 6 of the respondents were part of Association of Ghanaian Construction Artisans while 23 of the respondents were part of Institute of Engineering and Technology. A much of 72.9% of the whole responses obtained selected Ghana Institute of Construction as one of their professional bodies while only 10.2% selected Association of Ghanaian Construction Artisans as a professional body they join.

### 4.2.5 Improving Practical Knowledge

This question was asked to solicit from respondents whether they agree to the notion that this study would help improve the practical knowledge of unskilled artisans in the Ghanaian Construction Industry in relation to what NHRD has established for Ghana. Hence, in the long term the study is machinated into achieving a very important policy in the country by helping to improve practical knowledge of its citizens.

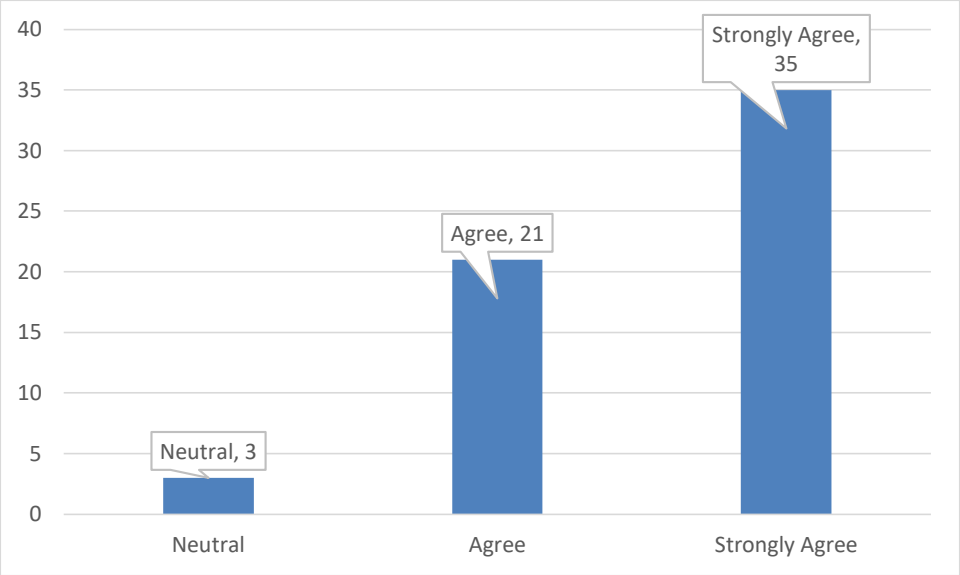


**Figure 4.4: Improving Practical Knowledge of Artisans**
Source: Field Survey (2019)

From Figure 4.4, It could be appreciated that thirty-five of the respondents strongly agree that the study is geared towards improving the skills and development of Ghanaian workers workforce. While twenty-one also agrees to this same notion. Only a much of three of the respondents agrees otherwise. This shows that the respondents of the survey are in consonance to the requirement or target of the study.

## 4.3 RELIABILITY ANALYSIS FOR ALL THE PARTS IN SECTION TWO

This section provides the reliability analysis of all the parts under section two of the survey questionnaire. Howland and Wedman (2004) postulated that before analysing data from a survey, one must check the internal consistency of the variables and the reliability of the scales used. The Cronbach Alpha's Co-efficient test is widely used in checking the reliability of scales (See for example Giffinger and Gudrun, 2010; Antwi-Afari et al., 2018). The Cronbach Alpha's Co-efficient of 0.700 or more is mostly considered to be very reliable.

**Table 4.2:** Reliability Analysis of all the Objectives

| | Cronbach's Alpha | N of Items |
|---|---|---|
| First Objective | 0.873 | 15 |
| Second Objective | 0.815 | 15 |
| Third Objective | 0.852 | 15 |

Source: Field Survey (2019)

In table 4.2, it can be seen that the Cronbach's Alpha value of all the objectives are above 0.700 which shows a high reliability of the scale used to measure each objectives of the study. Hence, we can conclude that there is a very good internal consistency among the variables which were used for the study. With all the alpha value above 0.800, one can confirm that the scale used was very reliable.

## 4.4 LEVEL OF PRACTICAL KNOWLEDGE REQUIRED OF UNSKILLED ARTISANS

The unskilled artisan is required to attain some level of practical knowledge at which the unskilled artisan can be tagged as having practical experience or being skilled in the work being done. Hence, this particular objective was formulated to help in determining the level of practical knowledge required of unskilled artisans in the GCI. Respondents were asked to rank the five-point Likert scale; in identifying the level of practical knowledge required of unskilled artisans. The Likert scale which ranges from 1 – 5 as follows; 1 – Not Important; 2 – Less Important; 3 – Moderately Important; 4 – Important and 5 – Very Important. Mean score ranking was preferred over other methods because it is easy to understand and provides a real-time information on each of the variables. The mean, standard deviation, standard error mean for each variable is calculated and shown in table 4.3.

**Table 4.3:** Level of Practical Knowledge Required of Unskilled Artisans in the GCI

| **Level of Practical Knowledge Required of Unskilled Artisans in the GCI** | **Mean** | | **Std. Deviation** | **Ranking** |
|---|---|---|---|---|
| | Statistic | Std. Error | Statistic | |
| Understanding of workers rules and obligations | 4.54 | .098 | .750 | 1st |
| Ability to take measurement and understand measuring instruments | 4.42 | .094 | .724 | 2nd |
| Appreciation of site health and safety | 4.37 | .113 | .740 | 3rd |
| Ability to appreciate the work being done | 4.37 | .096 | .869 | 4th |
| Ability to understand basics to appreciate any improvement in technology during their profession | 4.29 | .094 | .720 | 5th |
| Understanding of project timelines and increasing productivity on construction sites | 4.27 | .087 | .665 | 6th |
| Ability to appreciate people's rights and upheld their own human rights | 4.27 | .102 | .784 | 7th |
| Ability to understand figures and their meanings | 4.27 | .187 | .965 | 8th |
| The competencies to reduce cost on construction site through the use of requisite technology | 4.22 | .094 | .721 | 9th |
| Improving usability of resources and reduction in zero defects | 4.22 | .126 | .966 | 10th |
| Appreciation of quality assurance on construction projects | 4.20 | .102 | .783 | 11th |
| Cognisance with machines parts and their importance | 4.14 | .112 | .860 | 12th |
| Increased exhibited confidence and experience on work | 4.08 | .122 | .934 | 13th |
| Ensuring consistency in standards of work executed | 4.05 | .124 | .955 | 14th |
| Ability to forecast, plan and prepare ahead of schedule | 3.83 | .159 | 1.220 | 15th |

Source: Field Survey (2019)

From table 4.3, after analysis, it could be seen that one key practical knowledge required of unskilled artisans to attain is the ability to understand rules and obligations. This particular variable was ranked first by the respondents with a mean of 4.54, standard deviation of 0.750 and standard

error mean of 0.098. Ability to take measurement and understand measuring instruments was the second ranked variable with a mean of 4.42, standard deviation of 0.724 and standard error mean of 0.094. The third ranked variable is the appreciation of site health and safety. This variable came third with a mean of 4.37, standard deviation of 0.740 and standard error mean of 0.113. The fourth ranked variable also had a mean of 4.37 but it was ranked fourth because its standard deviation was higher than that of the third ranked variable. Just as Ahadzie (2007) had expressed, when two or more variables have the same mean, the one with the lowest standard deviation should be ranked first. Hence, making Ability to understand work being done to be ranked fourth. The last three ranked variables are; Increased exhibited confidence and experience on work; ensuring consistency in standards of work executed, and ability to forecast, plan and prepare ahead of schedule. Though these variables were ranked last, but their mean were higher than 3.5. Hence, attesting to the fact that they are still important variables to consider in identifying or appreciating the level of practical knowledge required of unskilled artisans in the GCI.

### 4.4.1 DISCUSSIONS

**Understanding of Workers Rules and Obligations**

One key issue that have been identified in literature is the ability of unskilled artisans to understand rules on the job and their responsibilities at the job sites (Bowen et al., 2008; Anin et al., 2015). Understanding of rules of workplace goes a long way to ensure that workers understand what is expected of them and the measure of importance which is placed on the work they do. Hence, an unskilled artisan who is conversant with his/her rules and obligations can generally perform well on construction sites and do not need motivations inform of money always to keep him/her glued to the company's objective. Bowen et al. (2008) asserted that to improve workers practice, recognition for work done over normal responsibilities is paramount.

### Ability to Take Measurement and Understand Measuring Instruments

Mojahed and Aghazadeh (2008) opined that one of the most important factors for improving productivity on construction sites is the level of skills and experience of artisans and hence, their ability to take measurement and understand the usage of measuring instruments. Kaoma and Muya (2016) also assayed that artisans should be equipped with the critical skills such as problem-solving ability, language expressions, ability to read measurement and understand measuring instruments. Hence, it is therefore not surprising that the respondents of this survey also agree to this notion that ability to take up measurement and understand measuring instruments is one of the practical skills required of unskilled artisans to obtain.

### Appreciation of Site Health and Safety

This variable was ranked third by the respondents of the survey as an important practical knowledge which unskilled artisans must possess. Hence, Wall and Clarke (1998) also assayed that artisans must be competent in the job organisation and occupational health and safety issues. Kaoma and Muya (2016) opined that artisans should be equipped with the sills of identifying solutions to problems and appreciating the occupational skills and health and safety issues amidst others. Thus, showing that unskilled artisans should be able to understand the site health and safety issues and protect their own lives and that of others in leading to improvement in company's productivity and reducing accidents on construction sites.

## 4.5 MILITATING FACTORS TO IMPROVING PRACTICAL KNOWLEDGE OF UNSKILLED ARTISANS

Irrespective of the desire to see that all unskilled artisans are able to obtain the requisite practical knowledge needed on the job, it has become evident in literature that there is still some militating factors or challenges which is preventing these unskilled artisans from obtaining the required level

of practical knowledge on construction sites. Hence, this objective was formulated to identify these critical or important challenges which is causing the failure of realisation of practical knowledge of unskilled artisans in the GCI. Respondents were asked to rank the variables under this dimension on a five-point Likert scale which ranged from 1 – 5 as follows; 1 – Strongly Disagree; 2 – Disagree; 3 – Neutral; 4 – Agree; 5 – Strongly Agree. Mean Score ranking was the tool which was adopted in analysing the responses of the survey. The mean, standard deviation, and standard error mean of each variable has been shown in table 4.4.

Deducing from table 4.4, after analysis, it could be seen that the most important challenge to improving practical knowledge of unskilled artisans in the GCI is the existence of Inappropriate instructional skills. This variable was ranked first with a mean of 4.54, standard deviation of 0.625, and standard error mean of 0.081. The second challenge ranked by the respondents is personal behavioural factors of the artisans. This variable came second with a mean of 4.42, standard error of 0.073 and standard deviation of 0.563; lack of availability of the requisite facilities to improve practical knowledge of unskilled artisans was the third ranked variable with a mean of 4.39, standard deviation of 0.558 and standard error mean of 0.073. Constant changes in technology was ranked fourth. The last three ranked variables in this paradigm are; varying working conditions; insufficient managerial practices on construction workforce, and lack of interest by the artisans to improve their knowledge. Surprisingly, all these last ranking variables also had a mean greater than 3.5, in fact, the last ranked variable had a mean of 4.08 which shows that all the identified variables in this dimension are all important militating factors which the respondents of the survey agrees to be a challenge to the realisation of improvement in the practical knowledge of unskilled artisans in the GCI.

**Table 4.4:** Challenges to Improving the Practical Knowledge of Unskilled Artisans in the GCI

| Challenges to Improving Practical Knowledge of Unskilled Artisans in the GCI | Mean | | Std. Deviation | Ranking |
|---|---|---|---|---|
| | Statistic | Std. Error | Statistic | |
| Inappropriate instructional skills | 4.54 | .081 | .625 | 1st |
| Personal behavioural factors | 4.42 | .073 | .563 | 2nd |
| Lack of availability of the requisites facilities to improve practical knowledge | 4.39 | .073 | .558 | 3rd |
| Constant changes in technology | 4.37 | .096 | .740 | 4th |
| Lack of clear conceptualisation and implementation of policies | 4.32 | .101 | .776 | 5th |
| Poor workplace conditions | 4.24 | .081 | .625 | 6th |
| Inadequate raw materials or resources for carrying out practical sessions | 4.22 | .091 | .696 | 7th |
| Non-practicality of training modules to improve practical knowledge | 4.20 | .090 | .689 | 8th |
| No strong regulation body | 4.20 | .110 | .846 | 9th |
| Lack of government support to trade unions | 4.20 | .127 | .979 | 10th |
| Low motivation in the form of what the end product would bring | 4.19 | .092 | .706 | 11th |
| Cost of training | 4.19 | .112 | .861 | 12th |
| Varying working conditions | 4.14 | .095 | .730 | 13th |
| Insufficient managerial practices on construction workforce | 4.08 | .106 | .816 | 14th |
| Lack of interest by the artisans to improve their knowledge | 4.08 | .126 | .970 | 15th |

Source: Field Survey (2019)

### 4.5.1 DISCUSSIONS

**Inappropriate Instructional Skills**

Stewart and Sambrook (1995) opined that the way of attaining knowledge through the use of systems (documented knowledge) shows that system knowledge takes on a generic standpoint, usually take general rules or instructions documented for the purpose at hand. The inability of senior artisans to give the requisite instructional skills or managers to create good trainee training modules or the government to link classroom with field experience has been expounded in

literature as one of the main barriers to the realisation of improving the practical knowledge of unskilled artisans in the GCI (Norton, 1987; Stewart and Sambrook, 1995; Loosemore et al., 2003).

### Personal Behavioural Factors

Artisans as they are human have their own behaviours, consent, and understanding of what is good for them and what they can appreciate. Anin et al. (2015) said that some artisans might not enjoy the need to improve their practical knowledge because of the behaviour of managers on construction sites towards them. Arthur-Mensah and Alagaraja (2018) opined that most unskilled artisans do not view the need to obtain any practical knowledge because most skilled artisanal jobs do not mostly come with any social security or other important factors lie the white-collar jobs, hence making it lose if flavour and attractiveness.

### Lack of Availability of Requisite Facilities to Improve Practical Knowledge

International Labour Organisation (ILO) (1987) shows that the availability of training facilities has decreased drastically. Akplu and Amankrah (2008) also asserted that the number of students enrolling into vocational schools has also dropped drastically by almost 4000. The training of large group of artisans requires the creation of the requisite facilities to ensure that such process becomes fruitful, but just as Ibrahim et al. (2010) has expressed the lack of availability of the requisite facilities for training of artisans in the construction industry is a hindrance to seeing the improvement in practical knowledge of unskilled artisans.

## 4.6 STRATEGIES FOR IMPROVING PRACTICAL KNOWLEDGE OF UNSKILLED ARTISANS

This objective was added to the study to provide ways of finding solutions to the some of the challenges of improving the practical knowledge of unskilled artisans in the Ghanaian

Construction Industry. Under this dimension are fifteen variables of strategies for improving practical knowledge of unskilled artisans in the GCI. Respondents were asked to ranked the various variables under this objective on a five-point Likert scale which ranged from 1 – 5 as follows; 1 – Not Significant; 2 – Less Significant; 3 – Moderately Significant; 4 – Significant 5 – Very Significant. Relative Importance Index was adopted as the tool of analysis for the respondents of the survey. The mean, standard deviation, and standard error mean of each variable has been shown in table 4.5.

Inferring from table 4.5 below, it could be seen that one of the strategies for improving the practical knowledge of unskilled artisans is implementing on-the-job training. This variable was ranked first with an RII of 0.936, mean of 4.68, standard deviation of 0.471 and standard error mean of 0.061.

**Table 4.5:** Strategies for Improving the Practical Knowledge of Unskilled Artisans in the GCI

| Strategies for Improving the Practical Knowledge of Unskilled Artisans in the GCI | Mean | | Std. Deviation | RII | Ranking |
|---|---|---|---|---|---|
| | Statistic | Std. Error | Statistic | | |
| Implementing on-the-job training | 4.68 | .061 | .471 | 0.936 | 1st |
| Making skilled artisans' jobs lucrative through better remuneration | 4.59 | .065 | .495 | 0.919 | 2nd |
| Competence based training of workers | 4.56 | .106 | .815 | 0.912 | 3rd |
| Improving government interventional policies | 4.54 | .074 | .567 | 0.908 | 4th |
| Implementing good management practices on construction sites | 4.54 | .112 | .857 | 0.908 | 5th |
| Developing initiatives to collaborate between local and foreign organisations for easy technology transfer | 4.51 | .074 | .569 | 0.902 | 6th |
| Government involvement in ensuring that there is the need for the training of unskilled artisans | 4.51 | .074 | .569 | 0.902 | 7th |
| Developing apprenticeship schemes or training | 4.47 | .081 | .626 | 0.895 | 8th |
| Improving working conditions | 4.47 | .088 | .679 | 0.895 | 9th |
| Reconceptualization of skills | 4.47 | .122 | .935 | 0.895 | 10th |
| Making available easy access to new technologies | 4.46 | .078 | .597 | 0.892 | 11th |
| Establishing artisans and craft examining bodies | 4.44 | .091 | .702 | 0.888 | 12th |
| Improving artisan's toolkit | 4.37 | .090 | .692 | 0.875 | 13th |
| Informal skill training | 4.34 | .086 | .659 | 0.868 | 14th |
| Training through apprenticeship | 4.29 | .077 | .589 | 0.858 | 15th |

Source: Field Survey (2019)

The second ranked variable as a strategy for improving the practical knowledge of unskilled artisans in the GCI is making skilled artisans' jobs lucrative through better remuneration. This variable was ranked second with an RII of 0.919, mean of 4.59, standard deviation of 0.495 and standard error mean of 0.065. Competence based training of workers was the third ranked variable

by the respondents of the survey as strategies required to improve the practical knowledge of unskilled artisans in the GCI. This variable came third with an RII of 0.912, mean of 4.56, standard deviation of 0.815 and standard error mean of 0.106. Improving government interventional policies; implementing good management practices on construction sites and the others were ranked chronologically as shown in table 4.5 above. The last three ranked variables are improving artisan's toolkit, informal skill training and training through apprenticeship. These variables though lastly ranked all have their means greater than 3.5 which shows that they are still important strategies to consider in improving the practical knowledge of unskilled artisans in the GCI.

### 4.6.1 DISCUSSIONS

#### Implementing on-the-job Training

Training is the act of transferring knowledge in the form of experiences, ideas, skills, customs and values from one individual to another from generation to generation (Asfaw et al., 2015). Hence implementing on-the-job training would help unskilled artisans to obtain first-hand experiences of the work being done, while combining it with the transfer of knowledge from their teachers, masters or instructors in the whole process. Wachira (2008) was of the view that on-the-job training helps to equip unskilled artisans with the requisite skills and also aid in the improvement of already existing skills of the workforce in the effort of appreciating changes in working environment, new technologies and innovations of particular interest. The importance of this strategy in improving the practical knowledge of unskilled artisans could be seen also in this study where the respondents ranked it highest among all the strategies identified in literature.

#### Making Skilled Artisan's Jobs Lucrative Through Better Remuneration

Offei-Nyarko et al. (2014) asserted that one main problem resulting in the lack of availability of unskilled artisans in the GCI is the low remuneration which skilled artisans enjoy irrespective of

the hard work they do. To ensure that unskilled artisans increase their propensity of improving their practical knowledge, better and stabilised remunerations should be made available for the various blue-collar jobs in the GCI (Kaoma and Muya, 2016). Offei-Nyarko et al. (2014) concluded that good remuneration leads to low job turnover of highly skilled artisans and encourages unskilled artisans to look for ways to improve their practical skills.

**Competence Based Training of Workers**

This is the kind of training that ensures that learners obtain the requisite knowledge, skills, attitudes and values to be effective and worthwhile in the working environment. Hence, this approach is based on concept of transferability (Norton, 1987; Anane, 2013; Everhart, 2014). In ensuring that unskilled artisans improve their practical knowledge, competence based training has been purported in literature to be of a very good approach as it also leads to the attainment of these five components; skills would be established, verified and made available in advance; the criteria for assessment should be formed and the conditions under which awards will be given to be made clear and public; instructions for the program or tutelages should be specified; assessment of competence level instructions for the program or tutelages should be identified, and assessment of competence level does not take off the learner's knowledge and attitude but the core skill being assessed here is the performance of the learner.

# CHAPTER FIVE

# CONCLUSIONS AND RECOMMENDATIONS

## 5.1 INTRODUCTION

This study was done to identify strategies for improving practical knowledge of unskilled artisans in the Ghanaian Construction Industry by using Kumasi metropolis as a case study. The aim of the study was to assess strategies for improving practical knowledge of unskilled artisans in the GCI by using Kumasi as a case study. The dissertation was divided into five main chapters. The first chapter discussed the general introduction of the study. Some key aspects of this chapter was the background to the study which provided a summary of literature on the topic under consideration; the problem statement which harnessed on the gap in literature which this study intended to fill; the research aim and objectives of the study which set out the vision and purpose for the study, and the research methods and scope which provided guides for attaining the aim of the study. Chapter two talked about the literature surrounding the study by considering important sources like thesis, books, journals and conferences, in all those discussing the strategies from improving the practical knowledge of unskilled artisans in the GCI.

The ensuing chapter was chapter three which focused on the research methodology of the study. This section of the study was considered as very key to the entire research because it determines how the research is to be conducted, and it influences the type of data which was to be collected and analysed. The chapter four was left to the analysis of the findings of the data retrieved from the survey and discussions of the findings thereof. In this study Relative Importance Index (RII) and mean score ranking was employed as the analytical tools. This final chapter (Chapter five)

presents a summary of the whole findings of the study, conclusions, limitations, recommendations and any directions for future research in this area.

## 5.2 REVIEW OF RESEARCH OBJECTIVES

The aim of the study was to assess strategies for improving practical knowledge of unskilled artisans in the Ghanaian Construction Industry, the case study of Kumasi metropolis. In order to achieve this aim, three smart objectives were formulated. The attainment of these three elating objectives are discussed below

### 5.2.1 Objective One: To identify the practical knowledge required of unskilled artisans in the Ghanaian Construction Industry

Objective one was achieved by firstly reviewing extant literature on human resources in the Ghanaian Construction Industry, the essence of skill shortages in the industry and the various ways or practical means which is expected of unskilled labourers to have. The research gap was very clear, there was the need to identify the practical knowledge which is required of unskilled artisans to obtain in GCI rather than the several noise which was made in literature that there is skill shortages or unskilled labourers do not have any practical skills. For this objective to be achieved, respondents were asked to rank the identified variable in literature based on how important they are for unskilled artisans to acquire and its leading to specific level which would be appreciated by all as appropriate on a Likert scale of 1 – 5 where one was Not Important; 2 – Less Important; 3 – Moderately Important; 4 – Important and 5 – Very Important. Adopting means score ranking as the tool for this section, the data retrieved was analysed. After analysis it was seen that all the variables which were identified in literature are all levels of practical knowledge required of unskilled artisans to obtain in the GCI with the topmost ranked variables as understanding of

workers rules and regulations; ability to take measurement and understand measuring instruments and appreciation of site health and safety on construction sites.

### 5.2.2 Objective Two: To determine the militating factors for improving the practical knowledge of unskilled artisans in the Ghanaian Construction Industry

While reviewing literature on the level of practical knowledge required of unskilled artisans to obtain, it became imperative to also consider some of the key challenges which are affecting the improvement of practical knowledge of unskilled artisans in the GCI. These militating independent variables (fifteen of them) identified from literature were strategically compounded into research questionnaire which basing on the respondents unrivalled practical and professional experience in the construction industry, were asked to show their level of agreement to the identified variables as challenges to improving the practical knowledge of unskilled artisans. The respondents were asked to rate the variables on a Likert scale with 1 – Strongly Disagree; 2 – Disagree; 3 – Neutral; 4 – Agree; 5 – Strongly Agree. Using mean score ranking as the tool of analysis, the data obtained from the survey was analysed. After analysis it was identified that all the fifteen variables obtained from literature are all challenges to improving practical knowledge of unskilled artisans in the GCI with Inappropriate instructional skills; personal behavioural factors and lack of availability of the requisite facilities to improve practical knowledge topping the list of challenges to improving practical knowledge of unskilled artisans.

### 5.2.3 Objective Three: To identify strategies for improving the practical knowledge of unskilled artisans in the Ghanaian Construction Industry

Objective three was added to this study to identify the novel ways in which the practical knowledge of unskilled artisan could be improved in the GCI. This objective was attained by first reviewing extant literature on the strategies adopted to improve practical knowledge and relating the

identified strategies to improving knowledge of unskilled artisans in the GCI. After the critical literature review, fifteen variables were identified from literature as strategies for improving the practical knowledge of unskilled artisans in the GCI. Falling on the nonpareil field experience and understanding of the subject matter, respondents were asked to rank the variables based on their level of significance as important strategies to be considered to improving practical knowledge of unskilled artisans in the GCI on Likert scale of 1 – 5; where 1 – Not Significant; 2 – Less Significant; 3 – Moderately Significant; 4 – Significant and 5 – Very Significant. Adopting Relative Importance Index (RII) as the tool of analysis, the identified variables were analysed. After analysis, it was seen that Implementing on-the-job training; making skilled artisans' jobs lucrative through better remuneration and competence-based training of workers were the main strategies which respondents identified as very significant to improving the practical knowledge of unskilled artisans. However, all the identified variables from literature were also considered as significant.

## 5.3 FINDINGS OF THE RESEARCH

In this study it became very imperative that there is a huge shortage of skilled labourers in the Ghanaian Construction Industry (GCI), and that there is the need to train more workers to gain the requisite skills needed of them to be able to work as skilled labourers in the Ghanaian Construction Industry. Some things in literature became very evident. For instance, the lack of level of practical skills which are required of artisans to gain before calling them as skilled artisans, the militating factors which prevents or hinders unskilled artisans from obtaining some practical knowledge to enable them to become skilled, and the availability of strategies which could easily be followed to convert or make an unskilled labourer skilled in the GCI.

After analysis, the findings pinpointed that the fifteen variables determined from literature are all important variables to be considered as practical knowledge required of unskilled artisans to obtain in the GCI, with highly ranked variables like understanding of workers rules and obligations, ability to take measurement and understand measuring instruments and appreciation of site health and safety. It also became clear that the fifteen variables identified from literature as challenges to the improvement of the practical knowledge of unskilled artisans were all also true where Inappropriate instructional skills; personal behavioural factors, and lack of availability of the requisite facilities to improve practical knowledge were highly ranked. The strategies for improving practical knowledge of unskilled artisans also became evident, and fifteen variables obtained from literature all were proven by the respondents as important strategies needed to improve practical knowledge. Among these strategies; implementing on-the-job training; making skilled artisans' jobs lucrative through better remuneration and competence-based training of workers were highly ranked by the respondents.

## 5.4 CONTRIBUTION TO KNOWLEDGE

This study made substantial contribution to knowledge in the field of knowledge management and training of unskilled labourers in the construction industry. In the knowledge management field, the study reviewed literature on the several types of knowledge available and created an avenue to see how clear the construction industry can improve the practical knowledge of unskilled artisans in the industry. In the field of training of unskilled labourers, the study first through literature identified the shortages of skilled artisans in the GCI. In finding a way forward to cumber this shortage, the study proposed the formulation of strategies or forms of training and retaining knowledge; for example, through apprenticeship, competence based training and informal skill training. The level of practical knowledge required of unskilled labourers were also specified in

literature as well as the challenges or militating factors to improving practical knowledge of unskilled artisans. Lastly, a section was dedicated for strategies for improving practical knowledge of unskilled artisans in the GCI.

The contribution to knowledge could be well appreciated in the form that understanding of workers rules and obligations, ability to take measurements and understand measuring instruments and appreciation of site health and safety were all seen as important practical knowledge required of unskilled artisans to obtain in the GCI. Challenges to improving practical knowledge of unskilled artisans include inappropriate instructional skills; personal behavioural factors of the artisans and lack of availability of the requisites facilities to improve practical knowledge. The strategies for improving practical knowledge consisted of implementing on-the-job training; making skilled artisans' job lucrative through better remuneration and competence-based training of workers.

## 5.5 RECOMMENDATIONS AND POLICY IMPLICATIONS

After going through this study, it becomes important to make various insightful recommendations and policy implications of this study. The emergence of the need of skilled artisans in the construction industry is not declining any soon. Hence, these thoughtful approaches should be implemented if there is any hope of getting skilled workers to work on construction sites or training of unskilled workers to cumber the difference of work available and the requisite skilled workers needed on construction sites.

- The government should be ready to set-up various training avenues for training labourers in the construction industry. This would help in creating individuals who have the needed skills to work on challenging projects and bring out the best in terms of cost reduction, quality performance and working within time.

- There should be a change in the educational curriculum of graduates to incorporate more practical skills other than the theoretical based as seen in the country.
- Initiatives should be developed to collaborate firms in Ghana and those in foreign organisations to enable the Ghanaian firms to easily learn new ways of doing things from the foreign firms through technology transfer.
- Artisans should be provided with the requisite equipment and tools which will be needed on their job to enable them to work freely without a worry of how best they can deliver their skills if the equipment or tools are not available.
- The government should be interested in artisanal education and try and make the artisanal job lucrative through better remunerations, pension schemes and end-of-service benefits.

## 5.6 LIMITATIONS OF THE RESEARCH

Every research is likely to have some potential limitations. The limitations of this study had to do with the timeframe of the study, which was very short, hence, it did not give much room to enable the collection of more responses from the target population for analysis. Moreover, sampling and measurement errors are issues which cannot be overridden entirely in any research. Notwithstanding, careful consideration, intent and adept approaches were used in computing and analysing the data. Therefore, this study can be seen to provide precise findings for further deliberations and contribution to knowledge.

## 5.7 DIRECTIONS FOR FUTURE RESEARCH

When undertaking the study, i.e. as literatures were reviewed, research methods determined and analysis and discussions formulated, there were some pertinent areas which were noted and seen

that this particular study could not cover but can only list them out for further study and future researches. The directions for future research are listed below:

1. Further study can be conducted in exploring the skillset of labourers in the Ghanaian Construction Industry, and how it can affect productivity on construction sites
2. Examining the nature of construction businesses and its effects on artisan's productivity and welfare.

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## APPENDIX

**Kwame Nkrumah University of Science and Technology**
**Department of Construction Technology and Management**
**Kumasi.**

## QUESTIONNAIRE

**RESEARCH TOPIC: Strategies for Improving Practical Knowledge of Unskilled Artisans in the Ghanaian Construction Industry: The Case of Kumasi Metropolis**

Dear Sir/Madam,

I am currently conducting a study on strategies for improving practical knowledge of unskilled artisans in the Ghanaian construction industry as part of the requirement for the fulfilment of award of MSc Construction Management at Kwame Nkrumah University of Science and Technology, Ghana. I would be extremely grateful if you would consider answering this questionnaire for me based on your unmatched experience in this filed.

The key objectives which this study would like to attain are listed below:

1. To identify the practical knowledge required of unskilled artisans in the Ghanaian Construction Industry.
2. To determine the militating factors for improving the practical knowledge of unskilled artisans in the Ghanaian Construction Industry.
3. To identify strategies for improving the practical knowledge of unskilled artisans in the Ghanaian Construction Industry.

Please, you can rest-assure that data collected from this survey would be used for only academic purposes, and as such your **confidentiality and discretion is highly guaranteed**. From the pilot survey, answering this questionnaire **should not exceed 10 minutes** of precious valued time. Therefore, with enthused appreciation of your time, and anticipation of your contribution, I would be extremely grateful if I get feedback of this questionnaire **not more than 7 working days from day of receipt**.

However, if you wish to know of the findings, recommendations and policy implications of this study after analysis, kindly leave your email address here …… For any further enquires or concerns, kindly address it to the contacts below.
Thank you so much for your kind support and contribution to this study.

Yours Faithfully,
Mr. Emmanuel Boakye
Email: b4boakye2@gmail.com/ b4boakye@yahoo.com Tel: 020184449/0244210127
Department of Construction Technology and Management (KNUST – KSI, GHANA)

Professor Theophilus Adjei-Kumi (Project Supervisor)
PMB
Department of Construction Technology and Management
KNUST – KSI, GHANA.

**PART A: DEMOGRAPHIC INFORMATION**

1. What is your current Profession in the Construction Industry?

a. Project/Construction Manager ☐
b. Quantity Surveyor ☐
c. Service Engineer ☐
d. Site Supervisor/Engineer ☐
e. Others, please specify …….

2. How long have you worked in your current job position?

a. 1 – 5 years ☐ b. 6 – 10 years ☐

c. 11 – 15 years ☐ d. 16 – 20 years ☐

e. Over 20 years ☐

3. What is your level of education or qualification?

a. HND ☐ b. BSc ☐

c. MSc/MPhil ☐ d. PhD ☐

e. Others, please specify …….

4. What professional body do you associate with? Tick as many as apply

a. Ghana Institute of Construction (GIOC) ☐
b. Ghana Institution of Surveyors (GhIS) ☐
c. Project Management Institute (PMI) ☐
d. Institute of Engineering and Technology (IET) ☐
e. Association of Ghanaian Construction Artisans (AGCA) ☐
f. If others, please specify …….

5. NHRD (Ghana National Human Resource Development) has formulated a policy that to ensure socio-economic development of the country, the skills and development of our workforce should be improved. Improving the practical knowledge of unskilled artisans in the Ghanaian Construction Industry is a step towards attainment of this policy. What is your level of agreement to this inference?

a. Strongly Disagree ☐
b. Disagree ☐
c. Neutral ☐
d. Agree ☐
e. Strongly Agree ☐

**PART B: LEVEL OF PRACTICAL KNOWLEDGE REQUIRED OF UNSKILLED ARTISANS IN THE GHANAIAN CONSTRUCTION INDUSTRY**

In order to provide strategic means of improving the practical knowledge of unskilled artisans in the Ghanaian construction industry, it is very important to first identified the level of practical knowledge which based on empirical studies and practice, unskilled artisans are supposed to attain in order to make them useful on construction sites.

Therefore, falling on your experience in the construction industry, kindly rank the following variables based on how important they are for unskilled artisans to acquire and its leading to a specific level which would be appreciated by all as appropriate. Kindly tick the correct box [√].

**1 – Not Important 2 – Less Important 3 – Moderately Important 4 – Important 5 – Very Important**

| SN. | LEVEL OF PRACTICAL KNOWLEDGE REQUIRED | Level of Importance | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| 1. | Ability to take measurement and understand measuring instruments | | | | | |
| 2. | Ability to appreciate the work being done | | | | | |
| 3. | Ability to understand figures and their meanings | | | | | |
| 4. | Cognisance with machines parts and their importance | | | | | |
| 5. | Understanding of workers rules and obligations | | | | | |
| 6. | Appreciation of site health and safety | | | | | |
| 7. | Ability to appreciate people's rights and upheld their own human rights | | | | | |
| 8. | Ability to forecast, plan and prepare ahead of schedule | | | | | |
| 9. | Appreciation of quality assurance on construction projects | | | | | |
| 10. | The competencies to reduce cost on construction site through the use of requisite technology | | | | | |
| 11. | Understanding of project timelines and increasing productivity on construction sites | | | | | |
| 12. | Improving usability of resources and reduction in zero defects | | | | | |
| 13. | Ability to understand basics to appreciate any improvement in technology during their profession | | | | | |
| 14. | Ensuring consistency in standards of work executed | | | | | |
| 15. | Increased exhibited confidence and experience on work | | | | | |
| | ***Any Other, Please State and Rank*** | | | | | |
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**PART C: CHALLENGES TO IMPROVING PRACTICAL KNOWLEDGE OF UNSKILLED ARTISANS IN THE GHANAIAN CONSTRUCTION INDUSTRY**

In as much as this study is geared towards devising strategies to improve practical knowledge, it is imperative to be cognisance with the challenges which could ameliorate the attainment of the aim of this study. Hence, through extant literature, several militating factors have been identified as challenges to improving practical knowledge of unskilled artisans.

Basing on your unrivalled practical and professional experience in the construction industry, kindly rank the following variables in bid of identifying the overarching challenges to improving practical knowledge of unskilled artisans in the construction industry. Please tick where appropriately [√] your level of agreement to the following.

**1 – Strongly Disagree 2 – Disagree 3 – Neutral 4 – Agree 5 – Strongly Agree**

| SN. | **CHALLENGES TO IMPROVING PRACTICAL KNOWLEDGE** | **Level of Agreement** | | | | |
|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | **5** |
| 1. | Low motivation in the form of what the end product would bring | | | | | |
| 2. | Lack of interest by the artisans to improve their knowledge | | | | | |
| 3. | Varying working conditions | | | | | |
| 4. | Constant changes in technology | | | | | |
| 5. | No strong regulation body | | | | | |
| 6. | Lack of clear conceptualisation and implementation of policies | | | | | |
| 7. | Personal behavioural factors | | | | | |
| 8. | Poor workplace conditions | | | | | |
| 9. | Lack of availability of the requisites facilities to improve practical knowledge | | | | | |
| 10. | Cost of training | | | | | |
| 11. | Inappropriate instructional skills | | | | | |
| 12. | Inadequate raw materials or resources for carrying out practical sessions | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 13. | Lack of government support to trade unions | | | | | |
| 14. | Insufficient managerial practices on construction workforce | | | | | |
| 15. | Non-practicality of training modules to improve practical knowledge | | | | | |
| | ***Any Other, Please State and Rank*** | | | | | |
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**PART D: STRATEGIES FOR IMPROVING THE PRACTICAL KNOWLEDGE OF UNSKILLED ARTISANS IN THE GHANAIAN CONSTRUCTION INDUSTRY**

Strategies for improving the practical knowledge of unskilled artisans in the Ghanaian Construction Industry are those pertinent approaches which can easily be adopted and implemented to improve the practical knowledge of unskilled artisans with documented results of their effectiveness.

Falling on your nonpareil field experience and understanding of the subject matter, kindly rank the following variables based on their level of significance as important strategies to be considered to improving the practical knowledge of unskilled artisans in the Ghanaian Construction Industry. Kindly tick the correct box where appropriately [√].

**1 – Not Significant 2 – Less Significant 3 – Moderately Significant 4 – Significant 5 – Very Significant**

| SN. | **STRATEGIES FOR IMPROVING PRACTICAL KNOWLEDGE** | **Level of Significance** | | | | |
|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | **5** |
| 1. | Improving artisan's toolkit | | | | | |
| 2. | Implementing on-the-job training | | | | | |
| 3. | Making available easy access to new technologies | | | | | |
| 4. | Developing apprenticeship schemes or training | | | | | |
| 5. | Improving government interventional policies | | | | | |
| 6. | Training through apprenticeship | | | | | |
| 7. | Competence based training of workers | | | | | |
| 8. | Informal skill training | | | | | |
| 9. | Establishing artisans and craft examining bodies | | | | | |

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|---|---|---|---|---|---|---|
| 10. | Government involvement in ensuring that there is the need for the training of unskilled artisans | | | | | |
| 11. | Improving working conditions | | | | | |
| 12. | Reconceptualization of skills | | | | | |
| 13. | Developing initiatives to collaborate between local and foreign organisations for easy technology transfer | | | | | |
| 14. | Making skilled artisans' jobs lucrative through better remuneration | | | | | |
| 15. | Implementing good management practices on construction sites | | | | | |
| | ***Any Other, Please State and Rank*** | | | | | |
| | | | | | | |
| | | | | | | |

Any further comments? Please, kindly indicate below

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……
…….

**THANK YOU!**