AN INVESTIGATION INTO THE TRAINING OF LABOUR IN THE INFORMAL CONSTRUCTION SECTOR IN KENYA

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ABSTRACT

The training of craftsmen in Kenya is the responsibility of their traditional employer the contractor. However, over the last 20 years, the contractors' motivation to train has been eroded by increased casualisation. Concurrently, there was growth of the informal procurement system propagated by private sector clients, who have no incentive to train because they are *ad hoc* consumers of construction services. Together these phenomena led to the collapse of the formal craft training and growth of informal skilling. Currently however, there is a lack of knowledge and understanding of the nature of informal craft training.

The intent of this research was to redress this by identifying the types of skills informally employed craftsmen are acquiring, how these skills are acquired and how training delivery can be enhanced. The hypotheses of the research were that the skills and skilling methods in the informal sector do not differ significantly from those in the formal sector and that the nature of training in the informal construction sector is clearly understood. Data was collected using structured questionnaires administered via the face-to-face survey method to a sample of 498 informally employed craftsmen.

The findings indicate that informally employed craftsmen are acquiring trade skills that are similar to those in the formal sector but with additional specialisms. More remarkably, these craftsmen are acquiring generic skills (estimation, material specification, supervision, and interpretation of documents) motivated chiefly by informal procurement practises that require them to execute duties that are traditionally in the domain of contractors and consultants. Informal skilling methods, although not formally recognised, dominate training amongst informally employed craftsmen with the exception to the electrical and plumbing trades which continue to train formally. Moreover, weekend training and instruction in English and Kiswahili can enhance training delivery. These findings indicate the significant differences between the formal and informal training systems and demonstrate the lack of understanding of the nature of training in the informal construction sector thereby disapproving both hypotheses.

The findings imply that appropriate craftsmen training should encompass the skill needs of the informal sector and take cognisance of the informal skilling methods in the formulation of viable training programs for construction craftsmen. Interventions should include building linkages between the formal training institutions and informal trainers in an effort to address the weakness of informal skilling. Such interventions should aim at the integration of both formal and informal craftsmen training as a means of addressing the shortages and inadequacies in craftsmen skills and to increase the levels of skill certification for the benefit of the sector. The study therefore concludes that the existing system of craftsmen training requires to be reviewed to make it more inclusive and responsive to the requirements of the contemporary market. Accordingly, the findings of the study, though not intended to provide a solution, will be useful in developing viable policy interventions to enhance the training of construction craftsmen. In addition, the study identifies the need for research into appropriate methods of assessing informally acquired skills and best practices for skilling of craftsmen.

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DEDICATION

To my beloved son **Brian Wachira** – may you scale even greater heights.

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ACRONYMS

ARVTC	Athi River Vocational Training Centre, Kenya
CETA	Construction Education and Training Authority, RSA
CIB	Construction Industry Board, UK
CIDB	Construction Industry Development Board, RSA
CITB	Construction Industry Training Board, UK
CITC	Christian Industrial Training Centre, Kenya
CMBT	Competence based modular training
CSCS	Construction Skills Certification Scheme, UK
DIT	Directorate of Industrial Training, Kenya
FKE	Federation of Kenya Employers
GCE	General Certificate of Education
GDP	Gross Domestic Product
IT	Information Technology
ITB	Industrial Training Board
ILO	International Labour Organisation
JBC	Joint Building Council, Kenya
JIT	Just-in-time training
JKUAT	Jomo Kenyatta University of Agriculture and Technology, Kenya
KCPE	Kenya Certificate of Primary Education
KCSE	Kenya Certificate of Secondary Education
KITC	Kisumu Industrial Training Centre, Kenya
KBCTFAIE	Kenya Building, Construction, Timber, Furniture and Allied Industries Employees Union
KS	Kenya Shillings
MITC	Mombasa Industrial Training Centre, Kenya
NCCER	National Centre for Construction Education and Research
NGO	Non-Governmental Organisation
NITD	Native Industrial Training Depot, Kenya
NIVTC	National Industrial and Vocational Training Centre, Kenya
NTB	National Training Board, RSA
NVQ	National Vocational Qualification, United Kingdom
NYS	National Youth Service, Kenya

ROK	Republic of Kenya
RSA	Republic of South Africa
SAP	Structural adjustment policies or programme
SPSS	Statistical Package for Social Scientists or Statistical Products and Service Solutions
SME	Small and Micro Enterprises
TEC	Training and Enterprise Councils, UK
TOPS	Training Opportunities Scheme, UK
UK	United Kingdom
USA	United States of America
USD	United States dollars
YP	Youth Polytechnics, Kenya
YOP	Youth Opportunities Programme, UK
YTS	Youth training scheme, UK

Jua Kali	Kiswahili expression for the informal sector that literally means 'hot sun' which was coined to reflect the conditions under which most operators in the informal sector work i.e. in the open under the hot sun.
Fundi	Kiswahili word for craftsman

CHAPTER 1 - INTRODUCTION

INTRODUCTION

Chapter 1 introduces the topic of research. The study seeks to investigate the training environment of informally employed craftsmen in the Kenya construction sector, entailing an exploration of the types of skills these craftsmen are acquiring, the methods of skilling in practice, and the interventions that may be instituted to enhance training.

The chapter is divided into four sections;

- Section *One* explains the background to the research by highlighting the contemporary characteristics of the Kenyan construction sector that have elicited a need to reconsider existing craft training practices.
- Section *Two* considers the main research issues of the study including the focus, problem statement, aim, and objectives of the research.
- Section *Three* outlines the scope of the study and the potential benefits thereof.
- Section *Four* profiles the structure of the thesis by briefly explaining the contents of the various chapters.

1.1 BACKGROUND TO THE RESEARCH

The role of training in construction sector

Training is a method by which an economic sector equips the workforce with the skills needed to accomplish the sector's objectives. Training accomplishes other important goals including the upgrading of skills; improving the performance of the workforce; enabling individuals to adapt to a sector changes such as its organisation and structure, technology used or market conditions; matching skills to the sector needs; providing potential for promotion and flexibility; improving sector competitiveness (via improvement of quality, productivity, safety and innovation); promotion of decent work; and developing human capital (Glover *et al.*, 1999; Liimatainen, 2002). In summary, training in construction ensures the high quality skills essential for achieving performance improvements resulting in satisfied

customers (CIB, 1998). However, in many countries, including Kenya, there has been a steady decline in formal training at the artisan level.

The Kenyan construction sector

The Kenyan construction sector, as it is the case in many developing countries, is labour intensive for two main reasons. Firstly, there is a shortage of foreign exchange making it difficult to import construction equipment resulting in low levels of mechanisation in the sector. Secondly, there is a ready availability of labour due to high population growth rates averaging 3% per annum over the past twenty years (ROK, 1980 - 2007), coupled with the fact that few primary and secondary school graduates (47% and 12%, respectively) continue with education. Consequently, there are more than 500,000 new entrants to the employment market annually from the school system alone, guaranteeing an available, unskilled and low cost pool of potential construction workers (Johanson and Adams, 2004; ROK, 2005). This labour intensive orientation of the Kenyan construction sector, means that the availability of requisite skills impacts heavily on the sector's ability to deliver the required output (Muya *et al.*, 2004).

However, whilst the new entrants to the sector are unskilled, site production comprises of a skilled set of activities requiring various categories of craftsmanship including *inter alia,* masonry, carpentry, joinery, plumbing, and electrical. Consequently, even unskilled workers in construction require some basic training on construction processes (Agapiou *et al.*, 1995) and thus it is improbable that the labour needs of the sector can be satisfied from the ranks of the unskilled unemployed. Therefore, while there may be a large potential pool of low cost workers willing and able to work in construction, they may not match the skills required by the sector to be productive. They thus need to be equipped with the requisite skills to become employable.

Traditionally in Kenya, the process of equipping individuals with the skills required by the construction sector has been carried out by contracting organisations via the apprenticeship model. Under this model a trainee acquires specific craft skills through a structured programme under the guidance of an experienced trained artisan. However, the number of site production workmen trained via this model has

steadily declined over the last 20 years. Figures from the Directorate of Industrial Training (DIT) show a decline in the recruitment of construction craft apprentices from 71 in 1998 to only 3 in 2002 (DIT, 2008g). In addition, between 1980 and 2003, only 6% of all accredited craftsmen had achieved the highest grade 1 status[1], while 81%, were certified at the lowest grade 3[2] indicating minimal skill upgrading (ROK, 1985 – 2006). Possible explanations for this decline in training are explored below.

Decline in demand

The foremost factor in the decline in demand for skills training has been the changing volume of demand for construction services within Kenya. The formal construction sector has experienced a steady contraction in demand as exemplified by its declining contribution to the economy from a high of 5.44% of GDP in 1985 to a low of 3.10% in 2002 (ROK, 1980 - 2007; KIPPRA, 2004). Most affected by this decline was residential building market which declined from Kenya Shillings (KS) 205.98 million (US$ 3.32 million)[3] in 1986 to KS 20.6 million (US$ 0.33 million) in 2004 while non-residential building (commercial and industrial) declined from KS 16.40 million (US$ 0.27 million) to zero in 2003 (ROK, 1980 - 2007).

The most important cause of this decline in demand was the harsh economic environment prevailing in Kenya, occasioned by the Structural Adjustment Programmes (SAPs) that led to a decline in public sector development expenditure as well as donor-funded investment (ROK, 1980 - 2007; Mitullah and Wachira, 2003; Wells and Wall, 2003). SAPs were macroeconomic stabilisation measures introduced by the World Bank and its affiliated donor institutions aimed at improving the economic performance of Kenya. These measures led to an acute decline in the governments' development expenditure and rise in interest rates for example, from 14% in 1987 to 38.5% in 1993 due to heavy public sector domestic borrowing (ROK, 1980 - 2007). The public sector, comprising of the central and local government, and parastatals, was traditionally the construction sector's largest client and hence the decline in public sector investment impacted on the whole sector. Additionally,

[1] Grade 1 is the highest level of craftsman competence characterised by the ability to perform a wide range of tasks, determination of tools, processes and materials to be used and ability to direct workers at lower grades.
[2] Grade 3 represents a worker with narrow skills working under supervision (DIT, 2008).
[3] 1 US dollar = 62 Kenya shillings as at 30-05-2008.

there was a decline of foreign investment from the development partners due to various governance issues (for example, corruption) associated with the Moi Regime and lack of accountability in public expenditure. Usually, public sector expenditure demands the use of formal construction processes for reasons of accountability and transparency. The decline of public sector investment in the building sub-sector led to the dominance of the private sector and the emergence of practices reflecting the private sector's needs. However, private sector formal investment has also been depressed during this period as a result of the uncertainty associated with the clamour for change of government which was realised at the end of the year 2002 as well as the high interest rates.

The public sector and donor organisations have, however, continued to be the only investors in the civil engineering sub-sector mainly in road construction where funding has gradually grown particularly between 1994 and 2004 where it tripled from KS 5,008 million (US$ 80.77 million) to 16,166 million (US$ 260.74 million) (ROK, 1980 - 2007) but still below the ideal requirement estimated at KS 130 billion (US$ 0.21 billion) in the 2005 Public Works expenditure estimates.

Volatility of demand

As the demand for construction services from the formal construction sector declined, it has become increasingly volatile, fluctuating unpredictably over the same period. Volatility was mainly caused by increasing irregularity of demand such that single projects could have a significant impact on the whole sector; for example, a 500% increase in demand during the construction of a cement manufacturing plant in 1996 to 1998 periods. Volatility of demand is further exemplified by fluctuations in cement consumption, one of the main indicators of performance of the construction sector; cement consumption declined from 1,118 metric tons in 1992 to 858 in 1994 and rose again to 1,161 in 1996 (ROK, 1980 - 2007).

This long term decline in demand and increased volatility has made long term planning by actors in the sector increasingly difficult due to the increased uncertainty. The need for flexibility by construction firms has consequently been amplified as they struggled to adapt to the changing business environment. One such response has been the increased casualisation of labour.

Casualisation of labour

The decline in public sector demand described above, and its associated uncertainty of future workloads, has understandably made manpower planning increasingly difficult. The few projects available inevitably led to an increase in competition among the construction firms, thereby eroding their profitability, and forcing them to seek to lower their operational costs and increase their flexibility. In response, firms took the well trodden path of construction sectors in many of the developed and developing world of shedding most off their labour obligations by increasing subcontracting to unregulated labour-only subcontractors (Prinsloo and Watters, 1996; Debrah and Ofori, 1997; Gann and Senker, 1998; Winch, 1998; ILO, 2001; Dainty *et al.*, 2005; Wells, 2007).

Labour-only subcontractors typically operate in the informal sector, outside the confines of employment legislation. They often have no legally enforceable contractual agreements with their workforce preferring to utilise informal employment relations as it is the case in South Africa (English, 2000; CIDB, 2004). Consequently, they offer no social protection or training to the workforce, enabling their labour costs to be lower, and hence more attractive to general contractors. Labour-only subcontractors mitigate their risk by employing the site production workmen on casual terms, that is; workers are hired on daily or weekly basis depending on the work available. Even general contractors, who do not subcontract labour, have increasingly been employing workmen on short term contracts to avoid paying wages and cumulative benefits (e.g. holidays, tools and travel allowances, retirement benefits) during lean times when they have no continuity of work, that is, the workers are hired on a project basis and made redundant on project completion (Clarke and Wall, 1998a; Jayawardane and Gunawardena, 1998; CIDB, 2004; Wells, 2007). Casualisation therefore affords the firms cost advantages, but leads to deterioration of conditions of service for the operatives.

This casualisation has the effect of reducing the in-house training traditionally offered by construction firms and has been observed in many other developing countries such as Zambia (Muya *et al.*, 2006b), Sri Lanka (Jayawardane and Gunawardena, 1998), South Africa (CIDB, 2004), Singapore (Debrah and Ofori,

1997) and even developed countries such as the UK (Agapiou *et al.*, 1995). In such situations, craftsmen gain skills mainly through experience rather than formal training or qualifications. Such skills, however, tend to be of lower quality leading to technical incompetence (Wells, 1998), exemplified *in extremis* by the workers eagerness to take undue risk that has led to collapsed buildings, death and the waste of clients' money (Ngare, 1998).

The casualisation of labour is a global trend (ILO, 2001) but in Kenya its impact on training has been extreme. Casualisation has eroded the incentive and responsibility to train by the contractors, as they are unable to reap any returns from such investment. As observed in other countries, contractors can no longer be expected to train a casualised workforce, thereby resulting in poor quality facilities, high material wastage and long term productivity decline (Jayawardane and Gunawardena, 1998).

Casualisation of labour has contributed to the pool of self-employed site production workforce in Kenyan construction sector. The numbers of this workforce has dramatically risen from 20,591 in 1993 to 183,900 in 2005 (ROK, 1980 - 2007). These workers find employment in two main ways, constantly moving between both forms of engagement as in the case of neighbouring Tanzania (Mlinga and Wells, 2002). Firstly, they periodically get employment in the formal sector on casual employment terms. Secondly, they trade as self-employed artisans hired directly by employers in the informal construction sector.

Provision of training

Training provision in Kenya is enabled through legislation. The Industrial Training Act Chapter 237 (ROK, 1983) established the Directorate of Industrial Training (DIT) as the body mandated to develop training policy, offer training, supervise national testing and certification, and develop the appropriate labour market signals in all sectors of the Kenyan economy including the construction sector (ROK, 1983; Ziderman, 2003). In addition to initial employment training, formally trained craftsmen are encouraged to continuously upgrade their skills from grade 3 to grade 1, and this is ideally accompanied by an increase in wages which provides the incentive. Funding for the DIT is sourced from the consumers of the craftsmen's

services via a sector specific Training Levy Fund. In practice, however, only those projects undertaken by the formal sector, whose contract sums are predetermined and which have formal procurement documentation, pay the levy via the general contracting firms. This effectively excludes informal construction sector workmen from formal training as only employees of the paying firms are eligible for training in the DIT run institutions, or in other accredited training organisations, or for compensation for approved employer initiated training (DIT, 2008c). Additionally, beneficiary contractors are encouraged to take on apprentices through the reimbursement of trainee wages and other training expenses (DIT, 2008b).

Due to the rise of casualisation of labour, the incentive of the contractors to train site production workers has declined. This has particularly affected apprenticeship which exclusively relies on the goodwill of individual employers (Arhani *et al.*, 2003). In addition, employers in the informal sector have no incentive to train and since they do not pay the training levy, their workmen are excluded from the formal training programs. This exclusion of informal sector operators, coupled with the decline in incentive to train among contractors, has significantly reduced the number of formally trained craftsmen. For example, in 2002 only three construction apprentices were recruited (DIT, 2008g). In response to the decline in demand for training in construction skills, coupled with the relatively higher costs of training in the technical skills, (inferred from data indicating that the estimated average direct resource cost of construction trade training in Britain is second only to engineering trades (Ziderman, 1975)), the training institutions have shifted their training emphasis to other non-construction skills further exacerbating the situation.

Clearly, the training model envisaged and pursued by the DIT no longer seems appropriate for the construction sector in view of the changing work environment. This has certainly been the case in other countries. For example, Agapiou (1998) notes that the Industrial Training Boards (ITBs) in the UK, which formed the basis on which DIT was formulated, have been altered to provide more of an oversight function as the sector changed to other strategies such as the National Vocational Qualifications (NVQs) which was more employment-led than education-led. It is likely that the DIT training model in Kenya also needs to adapt to the radically altered makeup of the construction sector.

The rise of the informal construction sector

As investment in the public sector infrastructure declined, the private sector has become the dominant source of demand for the building sub-sector particularly in the delivery of housing and small commercial buildings. Recorded private sector residential building (including extensions), increased from Kenya Shillings (KS) 234 million (US$ 3.77 million) in 1985 to KS 1,988 million (US$ 32.07 million) in 2004, while non-residential building (commercial and industrial), increased from KS 139 million (US$ 2.24 million) in 1986 to KS 520 million (US$ 8.39 million) in 2003 (ROK, 1980 - 2007). Actual figures would suggest/indicate even more significant increases because a lot of private sector construction is not captured in the official recorded output data. Wells (1999), comparing the indices of building output between 1991 and 1996, asserts that unrecorded building activity expanded by 175% to compensate for the fall in recorded activity and account for the increase in cement consumption. The mode of construction procurement followed by many private sector clients however, differs significantly from that of the public sector.

The prevailing high interest rates in the Kenyan financial sector, ranging between a low of 13.50% and a high of 38.50% over the past 20 years (ROK, 1980 - 2007), has made borrowing prohibitive to many private investors. The majority of private sector clients, therefore, are forced to build out of cash flow/incomes, and are excluded from the formal construction sector, which presupposes that the client has access to funding for the total project at commencement (Wachira *et al*., 2007). Due to this unpredictable nature of funding, these clients build on an incremental basis as money becomes available. In addition to the high cost of finance, there has been a reduction in the implementation and compliance with planning and building regulations, due mainly to declining public sector resources and growth in corruption in the local authorities that vet such activity. Consequently, an increasing number of building clients are completely by-passing the formal sector and engaging directly with enterprises and operators in an informal sector that can offer these clients greater flexibility (Wells, 2001; Mitullah and Wachira, 2003; Wells and Wall, 2003; Wells, 2007).

In this form of informal construction procurement, the availability of funding determines the arrangements for construction delivery. As part of the client's desire to minimise costs, the client will take on the responsibilities of a general contractor, for example; managing the project, purchasing the materials required (usually on the advice of the lead craftsman) and hire self-employed craftsmen directly to accomplish the construction (Wells, 2001; Wells and Wall, 2003; Wachira *et al.*, 2007). This is viable because of the prolonged duration of the construction phase, which undermines the efficiency and productivity advantages that a general contractor, acting as integrator/manager of the different trades, can provide. The craftsmen hired in this instance, are selected by their reputation in the locality, by 'word-of-mouth' recommendation, and by visual inspection of their previous work rather than price. Rarely are they required to produce formal proof of skill certification in a similar fashion to South African housing sector clients (Cattell, 1997) and in Sri Lanka (Jayawardane and Gunawardena, 1998).

This change in procurement practice has led to a significant expansion of the informal construction sector which now employs more labour than the formal construction sector (ROK, 1980 - 2007). Informal construction procurement has been used extensively in Kenya for the construction of individual low cost houses and in the recent past, to construct substantial buildings for example multi-storey (up to 8 storeys high) blocks of flats for rental, hotels, offices, shops and many high-class residences (Wells, 2001; Wells and Wall, 2003). Informal construction is thus a major contributor to Kenya's total construction output.

However, there are significant drawbacks to these informal procurement practices. The lack of training of the informal sector workmen, *inter alia,* could have a consequent impact on the quality of the output which has been tragically highlighted by failures in the buildings they undertake (Wells and Wall, 2003). For example, on 23 January 2006, a six storey building in downtown Nairobi collapsed killing 16 workmen and injuring several others (The Standard, 2006a, b). The collapse was caused by the craftsmen's ill-advised bid to hasten completion and minimise costs, by meddling with the concrete manufacturing process (*Ibid.)*.

Informal construction sector clients have no incentive to train as they are *ad hoc* consumers of construction services, preferring to hire skilled craftsmen. Moreover, the resultant self-employment practices are the least able to cope with training as exemplified by the direct correlation between the fall in trainee numbers and the numbers of self-employed in other sectors *(Agapiou et al., 1995)*. For example, Dainty *et al.* (2005) noted that one of the most influential factors underlying skill shortfall in the UK construction sector was the growth of self-employment which promotes low levels of training. Self-employment figures among craftsmen in the UK stood at 45% in 1995 and 36% in 2002 while trainee figures declined from 84,000 in 1970 to 46,000 in 1990 (Clarke, 2005). The UK construction sector has taken steps to encourage direct employment of workmen to, among other objectives, enhance training. The situation in Kenya is thus not unique, but arguably its impact on training is more extreme and currently there no measures in place to address it.

Implications of decline in training

The reduction in the training of new entrants, coupled with an ageing generation of craftsmen who are not being replaced, suggests that the capacity of the Kenyan construction sector is declining. The systematic deficits in construction capacity negatively affect not only the sustainability of development, but also poverty alleviation in many sub-Saharan countries (World Bank, 1984; Zawdie and Langford, 2000). This is because construction products are the physical foundations on which development effort and improved standard of living is established (*Ibid.)*. Therefore, the potential decline in capacity of the Kenyan construction sector, may adversely affect its social and economic development. An indication of the declining capacity of the sector is the rapid increase in construction prices, as the supply of construction services declines faster than demand for the same (Zawdie and Langford, 2000; KIPPRA, 2004). Between the years 1985 and 2004, the overall construction price index rose by an average of 185 per annum, while the consumer price index over the same period rose by only 41.35 (ROK, 1980 - 2007).

The change of government in the year 2002, coupled with an emphasis on the achievement of the universal Millennium Development Goals, and the increase in foreign investment inflow in Kenya, has elicited the potential for increased demand

for both formal and informal construction. The economy is already showing signs of recovery with real GDP growth increasing from 0.6% in 2002 to 5.8% in 2005 (Central Bank of Kenya, 2006). Demand for construction is expected to rise at a higher rate than GDP growth as economic growth increases. Given the decline in training capacity, the construction sector would be unprepared in terms of skills availability to cope with any increased demand, and would be forced to import skills from elsewhere, thereby increasing construction costs and preventing Kenya from gaining the maximum benefits from this increase in economic activity. The decline in training has in addition affected quality improvement efforts. Zawdie and Langford (2000), report that in Kenya, a major cause of complaint among clients is the poor quality of completed work. Similarly, Wells (1986) established that Kenyan contractors are reluctant to undertake any kind of high quality building work involving complicated finishes or structures, as this demands high quality craftsmen skills that are not readily available.

Experience from newly developed countries, particularly in East Asia, indicate that while availability of skills cannot catalyse growth by itself, lack of skills can seriously constrain economic growth, and the skills level and quality of workforce provide the cutting edge in competing successfully in the global economy (Johanson, 2004). It is thus imperative that Kenya addresses the skilling of her people including construction craftsmen.

Definition of terms

Skill is defined as '*the acquisition and mastery of knowledge and processes used to earn a living*' (Johanson and Adams, 2004:15), that is, the ability to perform learned techniques efficiently.

The informal construction sector is defined as comprising of (CIB Task Group 29, 1998:xii):

> *"Unregulated and unprotected individuals and enterprises engaged in economic activities in construction, including the supply of labour and production of building materials and components for both the formal construction sector and directly in response to client needs."*

1.2 THE STUDY

Research focus

Owing to its historical status as part of the British Empire past**,** the existing formal craftsmen training in Kenya is similar to that of the UK. In this form of training the trainee learns only skills that are related and relevant to his specific trade of interest (Gann and Senker, 1998; Clarke and Wall, 2000). Skill areas are defined and demarcated on the basis of an aggregate of physical, observable tasks seen to be involved in a particular trade, that is, the individual's knowledge of specific tasks are added together to constitute the skill (*Ibid.)*.

In the past, when craftsmen in Kenya were employed directly and trained by the contracting organisations, this form of training worked well. However, the increased casualisation of labour and growth of the informal procurement system suggests that it may no longer be tenable. This increased casualisation highlights the need for craftsmen to improve their employment flexibility via multiskilling to ensure continuity of work. The informal procurement system presupposes that craftsmen should be capable of working independently (and of organising themselves without expert supervision) amplifying the need for generic skills like quality control, measurement, and interpretation of drawings, in addition to the trade specific skills. Additionally, the lead craftsman (chief advisor to private client in informal procurement), is likely to require some degree of managerial skill, costing know-how, and multi-skilling to oversee the execution of the project on behalf of the inexperienced clients. Together, these requirements suggest that the craftsmen in the sector require an additional range of knowledge and skills beyond the confines of their specific trades.
The need for additional skills consequently raises concerns about the suitability of the existing trade-specific form of training. However, such concerns can not be addressed presently because there is a gap in knowledge, due to lack of information on what skills craftsmen in the Kenyan informal construction sector are currently acquiring. Furthermore, in view of the decline in formal training and growth of the informal construction sector, there is a possibility of the existence of emerging forms of skilling that are currently unknown. Information about the type of skills the craftsmen are acquiring and modes of acquisition is necessary not only as an

indicator of the skills required in the sector, but as a basis of formulating appropriate forms of training.

Accordingly, the primary focus of this research will be to the mapping of the craft skills and establishing the nature of training that is currently taking place in the Kenyan informal construction sector.

Problem statement

From the primary focus established above, the problem statement can be stated as follows:

Currently, there is a lack of knowledge and understanding of the nature of training taking place in the Kenyan informal construction sector. This gap in knowledge impedes the formulation of meaningful interventions by stakeholders in the delivery of appropriate training to craftsmen.

Research questions

This research will address the following questions:

- What skills do clients in the informal construction sector require from craftsmen?
- Do the skills acquired in the informal sector conform to the skill requirements of the formal construction sector?
- How are the craftsmen acquiring these skills in view of the decline in formal training?
- What training delivery methods are appropriate to enhance training in the construction sector given the sector's shift towards casualisation of labour and an increasingly informal procurement system?

Research hypotheses

The research hypotheses to be tested are:

1. *The skill requirements and methods of training craftsmen in the informal construction sector are not significantly different from those in the formal construction sector.*
2. *The nature of training in the informal construction sector is clearly understood.*

Research aim and objectives

The aim of this research is to identify the skills that craftsmen in the Kenyan informal construction sector are acquiring and the emerging methods of acquisition. Further, it will explore how training delivery can be arranged effectively and aligned with the sector's needs.

The main objectives of the research are:

- Identify the current skill needs in the Kenyan informal construction sector;
- Investigate the training methods in the Kenyan informal construction sector; and,
- Explore appropriate methods of training delivery given the sector's shift to casualisation of labour and the informal procurement system.

Research methodology

This research seeks to investigate the changing craft skills needs in the Kenyan construction sector and how training in these skills can be delivered. A positivist approach will be used to study the training practices currently taking place since the data sought is inherently objective in that it dealt with the actual training experience of the craftsmen.

Specifically, the research will use the survey technique to allow for collection of substantial data regarding what skills the craftsmen in the Kenyan construction sector are acquiring and the emerging modes of skill transfer, which will in turn, enable generalisation. In addition, the appropriate training delivery interventions by various stakeholders will be explored. This technique is selected because it is effective in obtaining primary information about an ongoing phenomenon from respondents (Rea and Parker, 2005), some who may have low levels of education. The survey instruments will comprise of structured questionnaires and interviews which will be used to collect mainly categorical data. The instruments will be administered on the following groups;

- Craftsmen at the sites to investigate what skills they are acquiring and methods of skilling. This will indicate the skills requirements of the sector.

- Employers and training institutions to corroborate the data collected from the craftsmen to explore what interventions they can employ to enhance training delivery.

1.3 SCOPE AND BENEFITS

Scope of investigation

This research will be limited to investigations in the Kenyan construction sector, but the lessons learned might be applicable to other developing countries particularly in Africa, which have similar conditions. The research will draw a lot from human capital economic theories and the construction management fields. While the research does not intend to create a policy for training in the construction sector, lessons learned may be useful to those drawing up such policies by highlighting the skill needs and methods of appropriate training delivery.

Potential benefits

The potential benefits of this research will include the ascertaining of the types of skills required and methods of skills acquisition by craftsmen in the Kenyan construction sector. This knowledge will inform any subsequent, meaningful interventions by stakeholders in the delivery of appropriate training. Additionally, the research may potentially identify sustainable methods of training craftsmen in construction sectors dominated by informal practises and possible methods of enhancing such training.

1.4 THESIS STRUCTURE

The thesis will be structured as follows;

Chapter 1 – Introduction

The topic of research is introduced. The research problem is stated including the research questions. Subsequently, research propositions are formulated with the aims and objectives of the study. A brief description of the research methodology and scope is then presented.

Chapter 2 – Literature Review: Craft skills

Secondary data on skills of craftsmen in construction sector will be reviewed. Specifically the role of craftsmen in construction, the historical development of craft training in Kenya and the determinants of skill requirements are examined. This will help in understanding the role of craftsmen in the construction process.

Chapter 3 – Literature Review: Skills acquisition

The methods of skill acquisition among diverse construction sectors are considered clearly highlighting modes of skilling and the interventions that may be utilised to enhance appropriate training. This will help to tap from the experiences of others and to identify best practice.

Chapter 4 – Methodology

Here the methodology applied in the study to address the research aims and objectives will be outlined. In addition, the methods of data collection, capture and analysis are explained.

Chapter 5 – Data Presentation and Analysis

The data collected from the field will be presented and analysed using various tools to enable conclusions to be drawn by answering the research questions. This will also indicate the extent to which the aims and objectives of the study were met.

Chapter 6 – Conclusion and Recommendations

This will contain a synopsis of the main conclusions that refer back to the aims, objectives and research questions of the study. Relevant recommendations will then be made and areas of further work indicated.

CHAPTER TWO – CRAFT SKILLS

INTRODUCTION

An appropriate training system is one that equips the workers with the skills they require to carry out their work responsibilities. Consequently, one of the aims of this research is to establish the types of skills informal construction craftsmen in the Kenyan sector are acquiring as a reflection of the skills the market requires. To inform the study, a literature review was carried out to explore the issues that impact on the skill requirements of construction craftsmen in other construction sectors with a specific focus on the UK from which the Kenyan system was derived.

Accordingly, the literature in this chapter reviews and highlights the various issues relating to skills development among craftsmen and is structured in four parts:

- *Section One* introduces the parent discipline of training and covers general issues including the role of skills development in Sub-Saharan Africa and informality in construction.
- *Section Two* explores the role of craftsmen in the construction sector highlighting the importance of their training.
- *Section Three* outlines a brief history of construction craftsmen in UK and Kenya, highlighting issues that impacted on their training.
- *Section Four* considers the craft skills requirements of the construction sector and its determinants, highlighting the drivers of skill changes, and the need for and advantage of multiskilling and deskilling.

The key issues raised are summarised at the end of the chapter, indicating their potential impact on the study.

2.1 TRAINING BACKGROUND

Human capital investment

Economic analysis of vocational training, of which craftsmen training is a part, is based on a number of different theories of human capital. These theories arose from the realisation that sustained economic development in many countries could

not entirely be explained by the growth in physical capital and was closely associated with substantial investment in the labour force. Moreover, evidence from poor countries has established that human capital is critical in determining the efficiency with which physical capital investment is utilised in production (Schultz, 1971; World Bank, 1984). Low investment in human capital slows both investments and market adjustments to new technology, denying poor countries the potential gains in efficiency (World Bank, 1984). Consequently, some economists argue that knowledge and skills account for the productive superiority of technically advanced countries (Becker, 1964b; Schultz, 1971; Mincer, 1993; Kearns *et al.*, 2006).

Human capital can be defined as resources embodied in people and capable of generating income (Schultz, 1971). Accordingly, vocational education and training is viewed as a form of investment in human capital intended to raise potential productivity (Stevens, 1999). Education and training as a form of investment is thus expected to have a return for all its stakeholders (Johanson and Adams, 2004). For the individual, returns are in the form of increased earnings, more stable employment, enhanced employability and higher job satisfaction; for the employer, gains in productivity and profits, lower worker turnover, reduced downtime, and reduced input costs; and for the economy, expanded output of goods and services leading to economic growth and higher taxable earnings (see Tsang, 1999; Grugulis, 2007). Training from this perspective is thus viewed as a form of human capital development that leads to skill acquisitions which are used to earn an economic return.

Like other forms of investment, human capital depreciates and can become obsolete. Depreciation occurs when a worker's skills are impaired by idleness e.g. through unemployment, whilst obsolesce takes place when a worker has skills that are no longer required by the market (Schultz, 1971). For example, the introduction of prefabrication in the UK construction sector has led to the depreciation of on-site craft skills, particularly the wet trades (Agapiou and Dauber, 2001). To avoid such adverse effects, human capital needs to be maintained through continuous skills upgrading. This highlights the need to consider training as a life-long endeavour requiring both initial and continuing investment.

Unlike other forms of investment, human capital differs in that the investment remains the property of the workers and can not be utilised without their consent. It therefore provides very poor collateral for employers or independent financiers as it can not be repossessed, eroding their motivation to invest (Becker, 1964b; Stevens, 1999). This creates challenges in the financing of training as it suggests that the individual is the best placed investor. In many situations, however, such as in the case of construction craftsmen, the individual may be unable to invest in their own training for reasons such as low earnings, and limited access to finance. This, amongst other reasons, causes training market failure that often necessitates government intervention e.g. via the institution of levies and other legal/fiscal provisions.

Training may be for acquisition of 'general' or 'specific' skills (Becker, 1964a; Dougherty and Tan, 1999; Stevens, 1999). General skills are skills that have productive value to many different employers, for example, literacy and numeracy. Employers are deemed to be generally unwilling to invest in general skills and hence the burden falls on the state via the education systems and the individual (*Ibid.)*. Employers nonetheless invest in training for in-service general skills when their costs are less than the cost of recruitment in the open market (Dougherty and Tan, 1999). Specific skills, by way of contrast, are skills that are valuable only to a particular employer e.g. familiarity with and knowledge of the production process that is unique to a firm. The burden of funding the acquisition of such skills typically falls on the employer as the ultimate beneficiary. In reality, however, skills are neither perfectly general nor completely specific but usually fall between the two extremes resulting in situations where investment in skills development is shared amongst all stakeholders (Stevens, 1994).

An additional category of skills is 'transferable' skills (Stevens, 1994). Transferable skills are skills that are of value to more than one employer such that there is competition to engage the worker i.e. both the training employer and the external employer can obtain a positive return on the training investment. The size of the external market increases the degree of competition between employers reducing the training employers' return on training investment and increasing the workers' return. This creates the incentive for 'poaching' where employers do not invest in

training but use higher wages to attract workers trained by others leading to underinvestment in training (Clarke and Wall, 1998a; Stevens, 1999). Construction craftsmen skills frequently fall into the category of transferable skills since they are of value to several employers e.g. masonry skills are required by all constructors that use stone as a building material. The possibility of poaching is thus a common and persistent problem (Agapiou, 1998; Clarke and Wall, 1998a).

From this it follows that this study will consider craftsmen as a form of human capital whose economic return can be enhanced via training investment. The transferable nature of craftsmen skills, coupled with the shared returns, make investment in this human capital a shared obligation among all the stakeholders.

Skills development

There is no accepted standard definition of skill. Notwithstanding this, skill refers to the ability of the worker based on dexterity, practical knowledge, theoretical knowledge and social ability (Winch and Clarke, 2003). From this perspective, skill is a social construct that delimits certain work as skilled, thereby reserving it for those labelled skilled and ensuring high wages, better chances of employment or some other advantage (More, 1982). Such skill is possessed through qualifications, experience and expertise (Grugulis, 2007). Considering skill as an attribute of the person is deemed more appropriate for this study because it focuses on the individual as a unit of analysis i.e. the craftsman and his ability to fulfil the requirements of his occupation. In contrast, skill can be considered as an attribute of a job or task i.e. skills required to successfully accomplish a task as detailed in a job/task analyses (Clarke, 1992b; Stasz, 2001; Grugulis, 2007). Accordingly, skill development in this study is defined as "*the acquisition and mastery of knowledge and processes used to earn a living*" in a given occupation (Johanson and Adams, 2004:15) .

An occupation may be defined as a formally recognised social category that has a regulated structure concerning training, qualifications, promotion and the range of knowledge (practical and theoretical) required to undertake the scope of tasks that fall within it (Winch and Clarke, 2003). Using this definition, the various construction trades e.g. masonry, carpentry, plumbing, painting, electrical works are deemed to

be occupations. For the purposes of this study, skill in these occupations will be deemed to include the ability to fulfil the tasks associated with the trade; take responsibility for equipment, tools and materials; interface with other trades; train others; and transfer the skills between different jobs (Clarke, 1992a). To fulfil these requirements the craftsman utilises the four broad skill areas needed in any workplace (Stasz, 2001):

- Academic or 'cognitive' skills, which are associated with subject areas in various school disciplines (such as English, mathematics, science) widely assessed via standardised tests and broadly transferable;
- Generic skills (such as problem solving, teamwork, decision-making), which take different meaning in different work contexts but are broadly transferable and have no standardised tests;
- Technical skills, which are specific skills needed in an occupation and which may have standardised assessments in licensed occupations; and
- Soft skills, which are work related attitudes (loyalty, punctuality) often judged through personal knowledge of an individual.

This study focuses on the technical and generic skills that may be acquired via training in formal technical or vocational schools; non-formally in vocational centres; formally on-the-job through apprenticeship; or informally on-the-job through observation, unstructured learning activities and practice (Johanson and Adams, 2004; Grugulis, 2007).

Training can be defined as any activity that promotes (or upgrades) the acquisition of knowledge, skills, and attitudes possessing value in the labour market including work experience (Fluitman, 1989; Shackleton *et al.*, 1995). Knowledge here is deemed to be the learning of relevant theory and techniques; skill as the ability to perform the learned techniques efficiently; and attitude as being the motivation and commitment to apply such knowledge and skills both in general and to specific situations in the workplace (Kumaraswamy, 1997). As training is broadly viewed as an investment in human capital that has economic returns to all the stakeholders, there is a consensus amongst governments, trade unions, employees and employers that training is a good thing (Grugulis, 2007). Consequently, in the

pursuit of higher standards of living for its citizens, economies engage in skills development via training. Notwithstanding the agreement that training is good, the various stakeholders approach training differently, creating a wide variety of training systems. This, in turn, creates diverse scenarios of the interaction of the worker with training.

Given the benefits of training, it is surprising that minimal training takes place across so many nations and firms. Grugulis (2007) proposes some possible reasons for this that are additional to those described under the human capital perspective previously discussed. Firstly, where organisations compete on cost, training becomes an unjustifiable extravagance compared to organisations that compete on quality where training is essential. This is increasingly evident during an economic downturn when training expenditure is often the first to be dropped to ensure the survival of the firm. As construction firms are traditionally awarded work on a lowest price basis through a competitive bidding process, it is understandable that training in many construction sectors, e.g. in the UK, South Africa and Kenya, tend to decline during recession (Cattell *et al*., 1996; Clarke, 2005; DIT, 2008g).

Secondly, many jobs are designed to be tightly controlled and defined, taking away the discretion and need for skill among the employees. Amongst construction craftsmen this may occur where they work under the supervision of the contractor who controls the execution of tasks, hence limiting the range of skills required from the former. On the other hand, where craftsmen work more autonomously, e.g. in the absence of a general contractor in the informal procurement system (Wachira *et al*., 2007), this may potentially suggest that they require comparatively diverse (extra) skills. Additionally, in many sectors, including construction, most jobs are concentrated among small and micro enterprises (SME) which are significantly less likely to train relative to large firms (Toner, 2000). Other reasons for minimal training include the various countries' legislative training requirements which are often viewed by employers as defining the appropriate rather than a minimum level of training whereby additions are deemed unnecessary and are viewed as clashing with the production objective since training removes the worker from operation (Loosemore *et al*., 2003). Together these reasons offer an explanation for the low levels of training in many construction and other economic sectors.

Skills development is an important driver of economic development worldwide, especially in Sub-Saharan Africa for the following reasons (Imbert, 1990; Afenyadu *et al.*, 2001; Johanson and Adams, 2004; Director General ILO, 2007);

- Trade liberalisation and increased global competition requires higher skills and productivity from workers to enhance competitiveness of local industries (see Gamble, 2003);
- Better skilled workforces attract foreign investment;
- Fast changing technology demands enhancement of workforce skills;
- To enhance the employability of the abundant supply of labour, particularly because the employment of people is socially desirable, economically beneficial and politically advantageous;
- Implementation of structural adjustment policies displaced many workers who needed skill upgrading before rejoining various sectors;
- Poverty reduction requires investment in productivity and skills of economically and socially vulnerable groups;
- Effects of HIV/AIDS depleting scarce human capital is magnifying the need for replacement of lost skills, and;
- Achievement of Millennium Development Goals requires training for skills development particularly in the construction sector which develops infrastructure.

Clearly, skills development is poised to play a crucial role in the economic transformation of Sub-Saharan African countries (including Kenya).

Informality

The term 'informal sector' was first used in Kenya by the International Labour Organisation (1972) to refer to that sector of the economy that operates outside the regulation of existing legislation i.e. it is 'extralegal'. The term was primarily used to describe that section of the poor who made a living working in the marginal sectors of the economy. Over time the term 'informal sector' has come to refer chiefly to individuals and micro-enterprises that were unregistered; unregulated; worked with little capital; and with simple technology. In Kenya the informal sector encompasses a variety of activities from shoe-making, tailoring, hair dressing, street hawking,

trading in groceries and food through to more highly skilled occupations such as construction crafts and motor mechanics. This multiplicity of activities makes it difficult to draw generalisations from the sector and has led to diverse definitions of the sector such as; enterprises with fewer than 50 employees; the self-employed (locally known as 'jua kali'); and unregulated sector (McGrath et al., 1995; Barasa and Kaabwe, 2001).

The informal sector in Kenya has been shaped by three principal phases of state intervention: a negative intrusion phase in the early 1970s where the government indiscriminately demolished informal establishments which were deemed illegal and enforced strict licensing policies; a passive indifference phase where the government adopted a 'hands off' approach in the late 1970s; and finally a positive intervention phase where the sector is currently hailed as an important employment generator and one which has been integrated into the national development plans since the 1980s (Barasa and Kaabwe, 2001). During all these phases, the informal sector continued to expand and thrive such that in 2004 it employed 5,993,000 persons compared to 1,764,000 in the formal sector (ROK, 1980 - 2007).

The steady growth of the informal sector is common to many Sub-Saharan Africa countries as a consequence of the rapid expansion of the labour force due to demographic growth coupled with a minimal increase in formal wage employment; the rising cost of education forcing many out of formal schooling and into the informal sector; and the impact of structural adjustment programmes (SAPs) in the 1990's leading to retrenchment of government workers who joined the sector (McGrath et al., 1995; Barasa and Kaabwe, 2001; Johanson and Adams, 2004). Given that many of these conditions still persist, the sector is likely to continue expanding in the foreseeable future. Consequently, skills development in the informal sector is an important tool for enhancing its performance by enabling its actors to operate more effectively and profitable and/or find work in the formal sector (Hirschowitz, 1991).

The informal construction sector can be defined as comprising of unregulated and unprotected individuals and enterprises engaged in economic activities in construction (CIB Task Group 29, 1998:xii). The enterprises here are mainly SMEs

that produce building materials and components for both the formal and informal construction clients e.g. walling blocks, clay products, metal casements, timber frames and doors or work as labour-only-subcontractors for general contractors. The individual operators encompass diverse craftsmen e.g. masons, carpenters, plumbers, painters, and electricians who are engaged in the formal sector by contractors and labour-only-subcontractors on casual terms or work directly for clients under informal procurement arrangements as self-employed operatives. To date, much of the research effort on the informal construction sector in Africa and elsewhere has focused on the transformation of informal enterprises into formal construction enterprises aimed at indigenising the contracting and material retail businesses which have traditionally been dominated by foreign firms (Wells, 2007). This focus has neglected the growing number of individual operators in the sector and highlighted the need for research into how informality impacts on their activities.

Informality among craftsmen in the construction sector of many developing countries, including Kenya, arises in two ways. Firstly, informal employment arises as a result of construction firms shedding their labour (including craftsmen) in pursuit of lower operating costs and greater flexibility in the face of declining and volatile demand for their services. This shedding of labour results in casualisation and a consequent reduction in the social protection of the labour (ILO, 2001; Wells, 2007) as explained in Chapter 1. Secondly, informal employment results from the increasing number of self-employed craftsmen being engaged directly by clients under informal procurement system (Wachira et al., 2007; Wells, 2007). In this system the client, in search of greater funding flexibility, does not engage a general contractor but employs craftsmen to execute the works intermittently as funds allow. The craftsmen under both of these forms of employment are contracted for their labour services only, including the supply of hand tools and may be deemed to be self-employed. As explained in Chapter 1, these two phenomena have combined to make informal employment the most prevalent form of craftsmen engagement in Kenya. Informal employment is not, however, unique to Kenya but is common in construction sectors throughout the developing world (Wells, 2007). Moreover, large numbers of self-employed craftsmen are also found in construction sectors in the developed countries e.g. in the UK (Dainty *et al.*, 2005). Currently the impact of informality on the skill requirements of craftsmen is unknown.

2.2 ROLE OF CRAFTSMEN IN CONSTRUCTION

Construction procurement commences with the client identifying his need for building and ends when the built facility is completed (Turner, 1997; Morledge *et al.*, 2006). In the intervening period the project goes through several stages, namely, feasibility, design, tendering and site production where different players are involved (*Ibid.*). The site production stage is where the design is realised on site via the installation of different inputs, materials and components.

Site production entails a variety of skilled activities requiring various categories of craftsmanship, including masonry, carpentry and joinery, painting, plumbing, and electrical, among others (Clarke and Wall, 1998a). Consequently, its success is dependent on the availability of craftsmen possessing the various requisite skills. Where appropriate skills among craftsmen are lacking, the sector is unable to meet the client's needs; innovation is stifled as employers prefer to use tried and tested methods, mainly traditional crafts; the sector has difficulty adopting new technology; and health and safety standards deteriorate (Agapiou *et al.*, 1995; CIB, 1998; Clarke and Wall, 1998a; Dainty *et al.*, 2005). Accordingly, skills development among construction craftsmen is an essential component of overall training in construction that plays an important role in guaranteeing the success of the site production phase and indeed the whole construction process.

Training in construction

Training in construction entails equipping new entrants with the requisite skills and upgrading the skills of the existing workforce in light of changes in the sector e.g. new technology, materials, components and processes. It is a career-long endeavour, particularly in view of the dynamic nature of the construction sector and the uniqueness of each built product. Training in construction is an essential tool for achieving performance improvements that aims at moving the sector away from competing on cost towards competing on quality (CIB, 1998). Such improvements enhance the sector's ability to meet the clients' demands for better value for money resulting in satisfied customers (*Ibid.*). Performance improvements may be accomplished via the use of training as a tool in reducing costs, time, defects and increasing the usability of the final products. For example, Table 2.1 below, adopted

from Gann and Senker (1998), summarizes some types of performance improvements required by clients and the skills and training necessary to achieve such improvement. A related benefit of training of the construction workforce is the enhancement of job satisfaction (Rowings *et al.*, 1996). Job satisfaction is important as it allows employers to get the best out of the workforce and ultimately helps to build a competitive construction sector.

Table 2. 1: Performance improvement targets and training.

Performance improvement targets	Skill implication	Training needs
1. 30% cost reduction	Increase in productivity	New technology and business process skills
2. 20% reduction in time	Concurrent engineering and faster working practises	New business process, communications and IT skills
3. 20% improvement in usability	Better links between customer and suppliers and life-cycle analysis	Communication skills
4. Zero defects	New skills in 'lean construction' techniques	'Right-first-time' shift in culture

Adopted from Gann and Senker (1998)

Other drivers of training in construction include the need to respond to job changes over time; retrain existing employees to take on new jobs; prepare for predictable future changes in skills; minimise wasteful activities that reduce worker productivity; provide potential for promotion and flexibility; improve sector competitiveness (via improvement of quality, productivity, safety and innovation); promote decent work; and develop human capital (Glover *et al.*, 1999; Liimatainen, 2002; Loosemore *et al.*, 2003; Alwi *et al.*, 2006). In summation, quality training in construction translates into quality facilities (Clarke and Wall, 1998a).

Training in the construction sector generally takes three formats; the formal, informal and the dual approach. Formal training is usually off-the-job training using lectures, seminars, films, videos, and computer aided packages. Informal training mainly involves on-the-job training, whilst the dual approach combines both formats to reinforce good practice and emphasise the relevance of the material learned (Loosemore *et al.*, 2003). Whichever format is chosen, for training to be effective in

construction, it must benefit the employers, the employees, the clients and other stakeholders. To ensure this, the trainee must acknowledge his role in the success of the construction process.

Training of craftsmen

The training of craftsmen and the quality of the constructed facility are inextricably interlinked because the former contributes to high quality standards of the final product. Craftsmen's training is thus an important vehicle towards improving the performance of the construction sector and ensuring customer satisfaction. This has been the consensus of a number of major reviews of the construction sectors including those of the UK (CIB, 1998; Egan, 1998), Australia (Hampson and Brandon, 2004), Singapore (Ofori *et al*., 2004), South Africa (CIDB, 2004) and Hong Kong (Tang, 2001) making the training of craftsmen a concern of all stakeholders in the construction sector.

Notwithstanding the above, many construction sectors continue to encounter barriers to the effective training of craftsmen. Many of these barriers persist because they stem from the nature of site production work on which the craftsmen are engaged and include (Loosemore *et al*., 2003);

- The cost of training delivery which is perceived to be expensive hence the first to be dropped during a recession e.g. as has happened in the UK in the 1980s and in Kenya over the last 20 years;
- Clashes with production where training of the craftsman is off-site e.g. to attend classroom training elsewhere;
- Where there are existing legislative requirements stipulating minimum levels of training, any additional training is viewed as an unnecessary luxury e.g. in India (Dagaur, 1997);
- Staff turnover concerns since craftsmen in construction are highly nomadic and subject to poaching thus eroding the motivation to train;
- An overly masculine working environment that emphasises learning-by-doing, hence perceiving classroom learning as non-productive; and,

- The prevalence of a learning-on-the-job culture where experience is valued as a primary learning mechanism by the craftsmen and the employers rather than formal training and education.

The inadequate training of craftsmen has negatively impacted various construction sectors and has manifested itself in a variety of ways including (Bennett, 1993; CIB, 1998; Egan, 1998; Gann and Senker, 1998; Agapiou and Dauber, 2001; CIDB, 2004; Dainty *et al.*, 2004; Ofori *et al.*, 2004; Kappia *et al.*, 2007);

- Skill shortages where employers are unable to recruit as many craftsmen as they need;
- Inadequate skills where craftsmen lack the range and breadth of skills necessary to work to the required standard;
- Reliance on semi-skilled workers;
- Poor quality work, resulting in significant rework and excessive defects;
- Low innovation, productivity and site safety standards;
- Increased supervision, delays and overtime because site supervisors spend more time instructing poorly skilled craftsmen and checking the resulting work;
- Increase in the overall cost of construction as a result of wage increases due to skill shortages, higher material wastage, and slow project delivery;
- Curtailing of construction firms' profitability, growth and diversification; and,
- Inhibits craftsmen career development making recruitment and retention difficult.

In many construction sectors the inadequate training of construction craftsmen is identified as a persistent concern. Consequently, construction stakeholders have instituted diverse interventions to encourage more appropriate training, including (Egan, 1998; Mackenzie *et al.*, 2000; Tang, 2001; CIDB, 2004; Hampson and Brandon, 2004; Ofori *et al.*, 2004);

- Use of preferential procurement strategies to favour constructors who train their craftsmen;

- Requirement that all craftsmen engaged on projects have appropriate qualifications e.g. hold valid cards under the Construction Skills Certification Scheme (CSCS) in the UK;
- Strategies to attract new entrants and retain those already engaged e.g. considerate constructors scheme, investors in people initiatives, and recruitment of women and minorities; all in the UK;
- Encouragement of return to direct employment which creates better infrastructure for craftsmen training;
- Improvement of vocational education for ongoing skills development among the craftsmen;
- Setting up of dedicated construction training bodies to oversee and co-ordinate training e.g. Construction Education and Training Authority (CETA) in South Africa;
- The introduction of a levy to provide training financing; and,
- The institution of tax incentives to employers who train.

Although there is no single acceptable prescription to redress inadequate training, the common threads in the construction processes in many countries imply that some solutions are common and can be customised to their respective localities. Moreover, the use of such diverse interventions, coupled with the continued research focus of various studies (Clarke, 1992b; Agapiou *et al.*, 1995; Clarke and Wall, 1998a, 2000; Dainty *et al.*, 2005; Chan and Dainty, 2007), highlight the difficulties involved in finding an appropriate and lasting solution to stem inadequate training amongst craftsmen.

In many countries the training of construction craftsmen is administered by central training bodies e.g. the Construction Industry Training Board (CITB) in the UK; the Construction Education and Training Authority (CETA) in South Africa; *Bundesinstitut fur Berufsbildung* (BIBB) in Germany; and *Stichting Vakopleiding Bouwbedriff* (SVB) in the Netherlands. Such bodies are dedicated to construction training in recognition of its importance in enhancing the role of construction in economic development. In recognition of the shared responsibility of training craftsmen, these central training bodies are typically jointly administered by all the

stakeholders in the construction sector involving employers, employees, training institutions and the government.

Traditionally, the responsibility for training construction craftsmen lay with their traditional employers; the contracting firms. When employers are the primary trainers in a sector, training fluctuates according to the economic cycles. In times of recession investment in training is reduced only to be increased during boom times (Rainbird, 1991). However, training takes time and because of the volatility of the construction sector compared to the business cycle, the sector has been unable to react in a timely manner creating the often cited phenomenon of 'skills gap' (*Ibid*.). This often leads to a training market failure, necessitating government intervention to ensure a continuous steady supply of the requisite skills. Additionally, when employers are the principal trainers, any changes in the sector that affect the way the firm operates or relates to their workforce will have an impact on the nature and form of training. For example, in the UK, the reduction of direct employment with the consequent increase in self-employment and labour-only-subcontracting led to a 42% decline in the number of apprenticeships between 1975 and 1986 (Rainbird, 1991). Similarly in Kenya, the decline in formal demand for construction services, coupled with its accompanying volatility, led to a collapse of formal apprenticeship as a form of craftsmen training with only 3 apprentices recruited in 2002 (DIT, 2008g).

Similarities in craftsmen training can be observed in countries that share similar historical backgrounds, especially where there is a dominating tradition e.g. countries that experienced the same colonial powers. Such countries tended to adopt the construction technologies, structures and organisation that resemble those of the colonial power. Such likeness is exemplified in the history of the Kenyan craftsman. Despite such similarities, there is no universal method of craftsmen training because the unique circumstances and experiences of each construction sector tend to modify each country's requirements over time.

2.3 HISTORICAL BACKGROUND

Prior to the arrival of Europeans in 1890, traditional buildings in Kenya were constructed mainly of wattle, mud and grass thatch. As in many other African societies, the skills involved were practised by all in the communities, particularly the women, and were passed on from generation to generation via verbal instruction and on-the-job training (Ngowi, 1997). Traditional forms of construction are still common in some localities in the rural areas of Kenya, particularly among the peoples that adhere to traditional ways of living e.g. the Maasai. For most of contemporary Kenya, however, traditional building practice has been supplanted by practices that first emerged in the industrialising societies of Europe and in particular the UK. The construction craftsmen skills under consideration in this study are therefore not indigenous to Kenya but were introduced by the British settlers and administrators during the colonial era. During this period many craftsmen were imported from India (also part of the British Empire) and they too have had their impact on construction craftsmen skills development. Consequently, the existing system of training craftsmen skills in Kenya is closely related to practices in UK interspersed with the influences of Indian craftsmen. Given this significant role of British practice, this section will commence with a brief outline of the history of training craftsmen in the UK so that the Kenyan experience can be explored within an appropriate historical context.

Construction craftsmen in the United Kingdom

Training of construction craftsmen in the UK has undergone various stages which are, in turn, related to the various forms of apprenticeship, which have historically been the most common mode of craft training (Clarke, 1992b, a; Forrester *et al*., 1995; Clarke, 2005). The first stage was the traditional guild apprenticeship common between the 12th and the 16th centuries in both the UK and in wider Northern Europe (*Ibid.)*. During this feudal craft stage, a master paid a fee to the trade company and took on apprentices and day labourers who worked for wages. The trade companies issued ordinances setting apprenticeship to seven years, not to be completed before 21 years of age. The companies were divided into trades dictated by the different types of materials they sold e.g. carpenters and wood,

bricklayers and clay, plumbers and lead. Accordingly, apprenticeship entailed both the production and working of the respective materials.

This was followed by the period of statutory apprenticeship initiated by the Elizabethan Statute of Artificers in 1562 which gave the masters absolute control over the entry into, and mobility of, their respective trades. This statute bound craftsmen to given localities and progressively undermined trade companies by extending its scope to occupations outside their control. Apprenticeship continued to be seven years but each journeyman could have only three apprentices at a time. Masters contracted for work and employed journeymen who were skilled workers paid by day rates and owning their own tools. The skill hierarchy was master, followed by journeyman, apprentice and labourer. In 1814 this statute was repealed, partly due to the emergence of new crafts, skills and occupations that were not covered under the law (*Ibid*.).

The repeal of the 1562 statute, including its apprenticeship clauses, allowed unrestricted entry into the building trades. This ushered in a period between 1814 and 1964 where training was characterised by the laissez-faire approach i.e. where training and consequently apprenticeship was voluntary with no state interference. With no party clearly responsible for their training, many apprentices were left as improvers or substitutes for cheap labour. Teaching of the trade fell mainly upon journeymen who resented training those who would replace them. A new skill hierarchy emerged consisting of the foreman with the skilled worker below him, followed by the semi-skilled worker and, lastly, the labourer. In this hierarchy, the place of the apprentice was unclear and, in the absence of any formal skill requirement, the tendency was to train for traditional needs, rules of thumb and firm-specific processes. This led to a training market failure, necessitating state intervention. Trade unions during this period demanded a limitation of the number of apprentices attached to each firm and the prohibition of piecework which was deemed to have a negative impact on training. Additionally, in the 1870s, inspired by the German model of training, attempts were made to combine both theoretical and practical education for the crafts training through the setting up of the City and Guilds of London Institute for the Advancement of Technical Education in 1871.

In 1964 the Industrial Training Act was passed as the UK government attempted to regulate training (*Ibid.)*. The act introduced the levy grant system and Industrial Training Boards (ITBs) to monitor and manage apprenticeships. In recognition of the joint training responsibility, ITBs were tripartite organisations involving employers, trade unions and the state in the formulation of the training system. The Construction Industry Training Board (CITB), founded in 1964 as a statutory tripartite (employer, employee and training institution representatives) organisation, was set up and partly financed with the levy fund. The CITB was responsible for establishing training policy; determining the length of training; registering trainees; setting standards of training and syllabuses; providing advice and assistance about training; devising tests to be taken by trainees and college instructors; running training courses; paying grants to reimburse firms that trained; giving allowances to trainees; and collecting training levies. In recognition of the value of theoretical knowledge, the CITB also introduced formal block-release vocational training as an addition to work-based training, culminating in the reduction of the apprenticeship period from seven to three years.

The Industrial Training Act, however, did not succeed in streamlining the training system hence other initiatives were instituted (*Ibid.)*. The Employment and Training Act of 1973 which allowed for levy exemption for employers that engaged in training, was followed by the Youth Opportunities Programme (YOP) in 1978 which was aimed at increasing the number of youths enrolling in craft training. The Employment and Training Act of 1981 initiated consultations to abolish the ITBs followed by the full operation of the Youth Training Scheme (YTS) in 1983. Other initiatives include the setting up of Training and Enterprise Councils (TECs) in 1988 as the training focus shifted to local labour markets with the TECs taking responsibility for responding to the specific and changing training needs of local labour markets by enabling employers to have the decisive and leading role in all training matters. In the 1990s, the period of legislative frameworks for training ended as the state reasserted that training was the responsibility of employers, leading to the 1991 introduction of the employer-led National Vocational Qualifications (NVQs) which is still operational in the UK today. Further, ConstructionSkills which was formed in 2003 as the Sector Skills Council for the entire construction industry to, amongst other duties, administer the training of

craftsmen in the UK (ConstructionSkills, 2008a, b). ConstructionSkills was formed mainly in response to the realisation that the UK construction industry was lagging behind in the provision of a highly skilled and productive workforce thereby negatively impacting its global competitiveness. It is an independent, employer-led organisation responsible for reducing skills gaps and shortages; improving productivity; increasing opportunities for the workforce; and improving learning supply. ConstructionSkills is, however, answerable to the state for meeting its targets as outlined in the Sector Skills Agreement (*Ibid.*). It has succeeded in increasing in the number of qualified workers employed by large construction firms but improving the participation of SMEs and self-employed craftsmen in training remains a challenge (*Ibid.*).

The above outline depicts the transformation of training of construction craftsman in the UK aimed at ensuring the supply of adequate skills to cope with the changing work environment. Moreover, adequate skills guaranteed the sustainability of craft occupations and consequently the construction process.

History of the Kenyan craftsman

King (1977) documented the development and training of indigenous craftsmen in Kenya in his book 'The African Artisan'. During the colonial days the Africans were judged by the colonial authorities as being unskilled and unproductive and lacking any craft worth speaking of (King, 1977). This may well have applied to construction skills because the vernacular building skills of the indigenous African population were perceived to be of no value to Europeans who were interested in replicating the building processes and technologies from their home countries. Consequently, the education system offered to the African (1911 - 1934) was mainly vocational where pupils were indentured as they entered primary school i.e. most of their school day was organised around productive labour in a particular vocation (e.g. masonry, carpentry, etc.), to which the pupils were legally bound. After primary school the 'natives' continued the next three years of their apprenticeship at the Native Industrial Training Depot (NITD). Through this, the colonial administrators manipulated the formal school system to produce craftsmen to meet their skilled manpower needs. Additionally, the skilling of Africans was driven by the difficult financial state of the white settlers who wished to substitute the Indian craftsmen

with cheaper African artisans. The Indian craftsmen, who had been brought to Kenya as a short-term solution to skilled manpower shortages, monopolised almost all the skilled positions including building skills at the time. This marked the introduction of apprenticeship as a means of acquiring craft skills in Kenya based on the UK apprenticeship system.

The Kenyan apprentice had, however, radically different aspirations from the UK apprentice. The former considered himself privileged for he was drawn from a tiny school-attending elite at the top of the native educational pyramid (King, 1977). Consequently, the apprentices did not consider craftsmanship or working on the settler farms as life-long careers but as staging posts to more prestigious careers in business, retail trade and the acquisition of land. Additionally, the five year apprenticeships produced craftsmen that were insufficiently versatile to meet the needs of European-owned estates and were equally unacceptable to the Indian firms who preferred on-the-job training (*Ibid.)*. This marked the beginning of a mismatch between formally acquired craft skills and job market requirements.

The colonial government in Kenya lacked interest in the methods of craft skill acquisition used in the Indian community even though they were highly effective in destroying both African and European competition (*Ibid.)*. Unlike their European counterparts, the Indian artisans (mainly carpenters and masons) held relatively privileged positions in the social hierarchy of their own communities because they belonged to a high caste in India where their services were only engaged in the construction of houses for the privileged (upper castes), and the construction of temples and public buildings (Harilal and Andrews, 2000). Moreover, the Indian artisan (before the mid 1970s) was usually employed directly by the client and had direct control of the labour process which was based on unwritten handicraft principles and practices developed through years of application (*Ibid.)*. These principles and practices were not learned in a formal institution but mainly via on-the-job training. Indian skills thus thrived chiefly on improvisation and this started to reproduce itself among their first African employees (King, 1977). Unlike the formal trade schools graduates, such craftsmen were unschooled like their Indian masters (known as *Mistris);* did not seek formal skill accreditation and learned the various technical processes entirely on-the-job.

Indian craft training led to the emergence of a different class of more successful African craftsmen who spread their skill throughout the country and in many areas constructed the first non-vernacular buildings in stone (*Ibid.)*. These Indian-trained craftsmen also introduced informal apprentice training. For a consideration, they took on learners who stayed with the masters until they felt they had acquired sufficient skill. The period of training was not fixed but depended on how long it took the apprentice to gain the skill depending on their aptitude and the work at hand. Skill proficiency was exemplified by how fast the trainee learnt to use certain tools or make certain fixtures, mainly via the improvisation in tools and techniques (*Ibid*.). In such informal apprentice training, trade tests are irrelevant; training is product specific and generally lacks any integration into the next level of technology. This method, however, succeeded in filling the demand for marketable skills and artisans trained were more likely to remain craftsmen throughout their working life.

An alternative form of craft skill acquisition in the Indian sector was informal on-the-job skilling (King, 1977). In this format, a small number of skilled Indian craftsmen would be hired to work with several hundred African casuals. As work progressed, differentiation would take place within the casuals with the Indian masters selecting those who showed aptitude for certain skills e.g. block work, plastering, roofing, etc., train them on-the-job and increase their pay accordingly. This training emphasised individual efficiency and productivity, producing rough craftsmen without much formal schooling. As they gained proficiency, this select group of African craftsmen would either be employed permanently or became labour-only-subcontractors to the Indian contracting firms. These emerging African labour-only-subcontractors trained their workers on-the-job just as they had been trained and were willing to take on apprentices who were educationally disqualified from entering formal apprenticeships (*Ibid.)*.

The Colonial government and the Indian masters thus ran two parallel systems of training of construction craftsmen in Kenya. The Indian system of training, although informal, proved to be more competitive and ultimately came to dominate the construction sector. Consequently, the formal African craftsmen training and indenturing system in primary school was abandoned (*Ibid.)*. The NITD was

converted into a post primary level trade-and-technical school and five other such schools were established in the 1940s and 50s, producing teams of graduates who went around the country building government sponsored school blocks and furniture. Through building the government schools, NITD graduates gained sufficient work experience to become self-employed. They, however, were not readily accepted in the construction sector which, by then, was dominated by Indian firms who preferred their own on-the-job training (King, 1977).

After independence in 1963, several initiatives were formulated to offer opportunities to school leavers and to develop as craftsmen. The Kenyan government enacted the Industrial Training Act (ROK, 1983) in 1964 modelled after the UK Industrial Training Act, in an attempt to regulate training. The Act only recognised the UK style formal craft skilling and ignored the Indian formats. The Act created the Directorate of Industrial Training (DIT) which took over the NITD trade-and-technical school which continued offering crafts skills mainly targeting secondary school leavers via formal apprenticeship courses. It however changed its name to National Industrial Vocational Training Centre (NIVTC). The other NIVTC associated schools offering construction craft skills include Mombasa Industrial Training Centre (MITC) established in 1979, Kisumu Industrial Training Centre (KITC) in 1971, and Athi River Vocational Training Centre (ARVTC) in 2003 (DIT, 2006).

Other institutions set up to train craftsmen targeted primary school graduates who made up the majority of school leavers. The National Youth Service (NYS), which is funded by the government, established a two year program in 1966 that linked little general education with productive labour and gave short intensive vocational instruction in, among other skills, masonry, plumbing and carpentry leading to DIT grade three trade test (King, 1977; Haan, 2001). The NYS has, however, over the years, shifted its focus towards secondary school leavers. Other vocational institutions were formed by voluntary bodies notably, the Village polytechnics.

Village Polytechnics (later renamed Youth Polytechnics) were developed in the mid 1960s by the National Christian Council of Kenya (NCCK), to equip primary school graduates with skills e.g. masonry and carpentry, that would enable them to be self-employed or to find wage employment in their local communities. They were

supposed to prepare their graduates to exploit the income opportunities of the rural areas; to offer a low cost form of skilling; and to steer clear of formal trade certification. Training in YPs was generally informal with the institutions being self-sustaining by producing goods for the local market (King, 1977; Haan, 2001).

Over the years the YPs abandoned their initial vision and became increasingly formalized, offering courses linked to formal trade testing. Some of the criticisms of the YPs include; the narrowness of their curriculum; training in skills that are not in high demand in the rural areas; graduates lacking tools and equipment to engage in self-employment; a poor image in the community where they are deemed to be catering for academic failures; widespread duplication of skills in all the institutions; securing few orders for their services resulting in trainees who lack practical experience; a situation exacerbated by limited industrial attachment; instructors with inadequate technical and pedagogical skills who are poorly motivated by earning low salaries; and a lack adequate tools and training materials (Boeh-Ocansey *et al.*, 1995; Haan, 2001). The most important problem of YPs is, however, the lack of sustainable financing. This is currently being redressed with assistance from donors e.g. DANIDA and the government's Ministry of Youth Affairs which has rehabilitated some YPs and donated tools and equipment (Haan, 2001; Wafula, 2007). Moreover, the government has committed KS110 billion (US$ 1.57 billion) to improve YPs and has given the instructors until 2010 to upgrade their qualifications to at least diploma level in a bid to improve the quality of graduates (Mathenge, 2007; Mathenge and Butunyi, 2007).

Other formal vocational schools include Approved schools, Technical schools, Christian Industrial Training Centres, YMCA Craft Training, YWCA Vocational Training, Limuru Boys Centre, and Private technical academies. All these offer courses linked to formal trade testing.

In contemporary Kenya, the skilling of construction craftsmen continues to follow both the Indian system and the UK system in parallel, with the former maintaining its dominance despite recent government intervention. The dominance of the former is sustained by the continued dominance of Indian owned firms in the Kenyan construction sector. Indians, (both Kenyan and foreign), own more than 80% of all

the large and medium sized construction firms registered by the Ministry of Roads and Public Works (Ministry of Roads and Public Works, 2007). In addition, many African firm owners and craftsmen trained in the Indian firms perpetuate the Indian methods when training their workmen.

2.4 SKILLS REQUIREMENT

The skills required of construction craftsmen are determined by factors mainly related to their work environment, including the prevailing technology, materials, methods of work and employment relationships in the respective sector which determines the tasks that have to be accomplished which in turn dictate the skills required. Existing skill varieties are captured in the craft skill profiles which, in turn, dictate the training provision. Craft skill profiles are, however, not static but are impacted by changes in the site production operations that alter the sets of skill required. Additionally, skill requirements are modified by multiskilling and deskilling. Below is an exploration of these issues and their impact on the determination of the craft skill requirements.

Craft skills profiles

Construction crafts profiles are determined by the recognition of various site operations as skilled work and hence vary amongst different construction sectors. In sectors where craft is equated to skill, the profiles tend to be narrow, following traditional craft boundaries to the exclusion of emerging occupations (Clarke and Wall, 1998b) e.g. in the UK, Kenya and South Africa. Alternatively, where new skill areas are readily recognised, skill profiles are continuously expanded (*Ibid.*) e.g. in Germany. Both scenarios are explored below by analysing experiences of different countries to highlight their impact on training.

As described previously, construction craftsmen skills in the UK have their roots in the feudal craft era where the skills practised were simply defined by the type of material used. Under this arrangement, the tasks that the craftsman learned and subsequently practised were dictated by the use of the relevant material in the various elements of the building. As the construction sector developed, the technology, materials and processes used changed creating new skill areas that did not traditionally belong to any of the crafts e.g. skills involved in suspended ceiling

work. Such new skills were socially recognised via the process of 'claiming' which entailed negotiations between the trade unions and employer associations that allowed a given craft union to claim the new skill as an additional task for its members e.g. cement flooring was claimed by plasterers (Clarke, 1992b). In addition, negotiation allowed for the registration of new skills including setting up of their training curriculum and qualification structure (Clarke and Wall, 1998a). Training is thus limited to traditional craft tasks.

Owing to this practice, new occupations emerging in the construction sector which were not claimed by any of the crafts remained unrecognised skill areas (Clarke, 2005). Accordingly, works outside the craft demarcations like concreting, paving, groundwork, cladding, drain laying, steel fixing, and plant operation, are classified and paid as labourer's work and do not attract any formal training programs or funding. This effectively denies the labourer the economic and social recognition of his skill. Moreover, the widening range of materials and increasing mechanisation in the UK led to the emergence of the general construction operative who was likewise unrecognised as skilled, thus not directly linked to any formal training or wage (Clarke and Wall, 1998a). Training programs in this system thus tend to cover narrow areas of site production work; have narrow trade profiles; and offer fewer training opportunities to site operatives.

Consequently, the UK construction sector remains dominated by traditional crafts with minimal redefinition of trade boundaries or the incorporation the new occupations although this is clearly necessary (Clarke, 2005). This dominance is clearly indicated in that, although there are more that 50 NVQs for the construction sector, 86% of all the trainees are found in the six traditional trades of bricklaying, carpentry and joinery, painting and decorating, plastering, plumbing and electrical work (Clarke, 2005). This is despite the fact that these traditional crafts form only 59% of the workforce employed (Clarke, 2006).

As in the UK, the Kenyan construction sector is similarly dominated by the traditional crafts. These trades were designed to meet the needs of the formal construction sector, hence are limited to skills required for employment by contractors (usually technical skills only). They are comparable to the classifications in the UK and

South Africa which, like Kenya, and for similar historical reasons, closely follow the UK system in having a strong craft basis (see Table 2.2 below). The five trades are the only recognised skilled crafts under the DIT formal training programs; trade testing; wage negotiations; and tripartite agreements (ROK, 1985 – 2006; DIT, 2008f; JBC, 2008). All other operatives are classified as unskilled.

Table 2. 2: Craftsmen trade profiles

Kenya	UK	South Africa
Carpentry and joinery	Carpentry and joinery	Carpentry and joinery
Masonry	Masonry	Masonry
Electrical wireman	Electrician	Electrician
Plumber pipe fitter	Plumber	Plumber
Painter decorator	Painter/decorator and plasterer	Painter/decorator and sign writer
	Bricklayer	Bricklayer
	Roofer	Plasterer
	Heating and ventilation	Wall/floor tilling
	Scaffolder	Metal Worker (architectural)

Source: Adopted from (HSRC, 1985; Clarke and Wall, 1998a; DIT, 2008d)

In Kenya, the traditional crafts have persisted primarily because of the continued prevalence of technology, materials and processes that favour these trades, reflecting the low levels of innovation in the construction sector. For example, the use of wet trades is still prevalent and prefabrication is rare; stones are the most commonly used walling material, hence encouraging the prevalence of the masonry trade while bricklaying was never classified as a unique trade because the use of clay materials is limited compared to countries such as the UK and South Africa. Lower levels of specialisation have, in addition, led to the aggregation of some skills e.g. plastering and wall/floor tiling though common, still form part of the masonry trade while heating and ventilation are shared between the plumber and electrician (ROK, 1963).

Given the ever-changing dynamics of site production work, it is plausible that the narrow skill profiles in Kenya have been impacted by changes in the sector, particularly changes in the modes of craftsmen engagement, resulting from increased casualisation and self-employment under the informal procurement system. These changes could potentially alter craftsmen work responsibilities, hence requiring additional skills from them. Such scenarios have been known to create changes in the types of skills and provision of training craftsmen in other sectors (CIB, 1998; Gann and Senker, 1998). For example, in the UK the changing landscape within which skills are developed and deployed has led to fundamental changes in the structure of skills and training provision (*Ibid.)* although the effect in Kenya is presently unknown.

In contrast to the British and Kenyan situation, many of the new skill areas are recognised as trades in other national construction sectors such as Germany and the Netherlands (Clarke and Wall, 1998b). Such recognition was achieved through the process of social negotiations and the new occupations are included in the training programs and paid as skilled work. Consequently, the number of trade specialities in Germany and the Netherlands are far greater at 14 and 16, respectively (see Table 2.3 below).

Moreover, in both Germany and the Netherlands the concept of the construction labourer is marginalised as almost all construction activities are covered under the various trade specialities. Under this system certain trades emerge as universal building workers i.e. the bricklayer in Germany (20% of the operatives and 40% of trainees) and the carpenter in Netherlands (a third of the operative and two thirds of the trainees). These universal building workers are 'all-rounders' capable of undertaking most of the tasks in small building firms. Training systems in this format thus offer more comprehensive craftsmen training covering a wide range of site production works.

Evidently, the training of craftsmen and consequently the skill profiles is closely related to the classification of skilled site production work. Skill profiles are, however, dynamic as they are impacted by changes in the craftsmen's work environment necessitating periodic review.

Table 2. 3: Dutch and German trade profiles

Dutch trade profiles	Germany trade profiles
1. Woodwork	*1. Building*
General carpenter	Bricklayer
Finishing carpenter	Concretor
Restoration carpenter	Furnace and chimney builder
Workshop carpenter (joiner)	
2. Masonry	*2. Finishing*
'All round' bricklayer	Carpenter
Bricklayer and plasterer/tiler	Plasterer
Plasterer/tiler	Tiler
Bricklayer	Floor screeder
	Insulator
	Dryliner
3. Concrete work	*3. Civil engineering*
Concrete construction	Roadworker
Formwork	Pipe layer
Precast concrete elements	Canal worker
	Well worker
	Tracklayer
4. Prefabricated components	*4. Specialisms*
Manufacture of timber elements	Cladder
Install timber elements	Building 'sealer'
5. Specialisms	
Roofing/rainwater/drainage	
Steel reinforcement (concrete)	
Natural stonework	

Source: Adopted from Clarke and Wall (1998b)

Drivers of skills change

The changing nature of the craftsmen's work environment (work and workplaces) impacts on the knowledge, skills and attitudes necessary for their employment and work performance (Stasz, 2001). Consequently, there is increasing realisation that the traditional classes of skills are inadequate to cope with the range of work required in today's construction sector. This is exemplified by the continuing erosion of existing demarcation lines between the various trades, the growth of new classes of skills, increased need for specialisation in some skill areas, and multi-skilling in others (CIB, 1998). In addition, new trades are typically growing out of crafts developing specialist activities or due to the separation of specific tasks in the trade e.g. the shop fitting trade evolved out of the carpentry trade and tiling separated from plastering in the UK (Clarke, 1992b). Changing craftsmen work environments therefore dictate the types of skills required of them.

Changes in the existing craftsmen skill requirements are driven by several factors. Firstly, changes in technology may demand new skills. For example, the increased use of concrete frames requires steel fixing skills while the changing degrees of mechanisation require more technical, knowledge-based skills (Clarke, 1992a; CIB, 1998; Gann and Senker, 1998). Secondly, new materials, components and processes are altering the skills in each craft and the boundaries between them as the modern construction sector is confronted with a variety of materials (Clarke, 1992a; Gann and Senker, 1998). For example, plumbers who may have worked with copper and lead only, now find themselves working with copper, steel, and plastic (Clarke, 1992a). Additionally, the introduction of some new materials is creating new trades e.g. the asphalt trade has grown from the use of asphalt (*Ibid.)*. Other drivers of changes in skills requirements include changing patterns of work that give rise to new work practices; inadequate training causing operatives to get employment in markets that differ from the skills they have acquired; and the increase in maintenance works that are increasingly demanding multi-skilled operatives (CSSC, 1989) .

Moreover, the changing work environment highlights the importance of the craftsmen's underpinning knowledge to enable them to comprehend the interfaces between tasks i.e. think horizontally about the concurrent work of other trades and vertically about the relationship between work items on the site (CIB, 1998). Accordingly, contemporary craftsmen require knowledge and skills relating to job organisation, safety and health, quality control, principles and properties of diverse materials rather than specific work techniques (Clarke, 1992a). The need for underpinning knowledge impacts the set of skills required of the craftsmen, hence indirectly driving skill changes. In addition, for craftsmen to cope with their changing work environments, they require skills that afford greater flexibility to enable them to renew their skills over increasingly shorter periods of time (Fowler, 1998).

The changing nature of craftsmen's work environment therefore results in dynamic, constantly-changing craft skill requirements. Consequently, there is a need for each construction sector to periodically map out its crafts skill requirements (CIB, 1998). Such mapping can be accomplished by identifying the skills that the craftsmen are acquiring as an indication of the market requirements and forms a basis for the

formulation of comprehensive training programs that take cognisance of changes in the work environment (*Ibid.*).

The Kenyan construction sector has experienced changes in the work environment of craftsmen in the last 20 years, driven mainly by the increased casualisation of operatives, the decline of the formal sector, and the growth of informal procurement (ROK, 1980 - 2007; Wells, 1998; Wells and Wall, 2003; Wachira *et al.*, 2007). These changes have altered the craftsmen's employment relationships from direct employment by contractors towards informal engagement terms with contractors and developers. This has undoubtedly impacted on their work responsibilities and consequently their skill requirements. As with the experiences of other construction sectors, it is highly plausible that these changes have led to alterations of the crafts skill requirements possibly including a degree of multiskilling.

Multiskilling of craftsmen

Multiskilling refers to the situation where a worker's breadth of skills crosses a number of trades, such that they can participate in several work processes (Burleson *et al.*, 1998; Haas *et al.*, 2001; Gomar *et al.*, 2002; Carley *et al.*, 2003). Consequently, multiskilling modifies the craft skill requirements by allowing the workers be to assigned tasks based on their ability to perform, unrestricted by traditional job descriptions or work boundaries. In addition to multiple trade skills, multiskilling amongst construction craftsmen may extend to encompass generic and soft skills like 'customer focus' which are demanded by some employers (Dainty *et al.*, 2005). The latter multiskilling utilises a greater extent of abstract and generalised knowledge demanding broader theoretical training for the craftsman.

Usually, multiskilling starts with the mastery of one trade followed by a gradual extension to tasks beyond the limitations of the specific trade as a form of job enlargement (Bobroft, 1991). In practice, therefore, the multiskilled craftsman is created over time via participation in many projects that afford exposure to diverse skills (Haas *et al.*, 2001). For new recruits, the basis for multiskilling occurs via the attachment as helpers to various craftsmen, thereby affording them an opportunity to observe and start learning the diverse trades (Burleson *et al.*, 1998).

Research in the construction industry has identified the following advantages associated with multiskilling;

- Since the craftsman understands the entire production process, they are able to respond to unexpected events without consulting the supervisor hence reducing supervision costs (Carley *et al.*, 2003). Moreover, craftsmen are able to detect flaws in each other's work, fill in for each other, and apply problem solving techniques ensuring the smooth running of the site (Alster, 1989; Haas *et al.*, 2001);
- Craftsmen benefit from increased potential earning, greater job security and better career opportunity through continuous employment i.e. multiskilled craftsmen have lesser vulnerability to unemployment and have been shown to have an increased average employment duration on a job by 18 – 47% (Burleson *et al.*, 1998; Carley *et al.*, 2003);
- Improved quality, productivity (by removing demotivating factors like idle time and frequent layoffs), safety and minimisation of disruption of work (Haas *et al.*, 2001; Gomar *et al.*, 2002);
- Reductions in worker turnover since the craftsman can be utilised throughout the project (Bobroft, 1991; Burleson *et al.*, 1998);
- The greater flexibility enjoyed by the craftsman in job assignments increase their likelihood of advancing to supervisory positions which require knowledge of many tasks and the interfaces between them (Haas *et al.*, 2001);
- Increased employability and job satisfaction for the craftsman due to increased productivity, greater participation in work processes and job enrichment (Bobroft, 1991);
- Potential reductions (5 – 20%) in labour costs (arising from reduced recruiting and screening, employee orientation, safety, and social costs), and up to a 35% reduction in the required workforce (Burleson *et al.*, 1998);
- Enhanced flexibility and competitiveness of the firm (Gann and Senker, 1998; Haas *et al.*, 2001);
- More effective response to labour shortages especially during recessionary periods (Alster, 1989);
- Usefulness in the initial and final stages of construction projects where a broad variety of tasks are utilised (Haas *et al.*, 2001);

- Ideally suited for developing varied small capital projects that involve activities with relatively short durations (*Ibid.)*;
- Especially suited for facility maintenance due to better diagnosis of problems related to more than one craft and the ability to perform unforeseen maintenance activities (*Ibid.)*; and
- Encouragement of the craftsmen to support management's labour-saving techniques because of the ease with which multiskilled craftsmen can be redeployed (Carley *et al.*, 2003).

Multiskilling does, however, also have a number of limitations;

- Worker resistance, particularly senior more skilled craftsmen, for fear that their job skills will be devalued leading to layoffs and resistance by trade unions (Carley *et al.*, 2003);
- Limited to the individual craftsman's capability to learn a variety of trades (*Ibid.)*;
- The cost of training can be substantial due to the broader training, hence lower return on training investment when compared to training in traditional specialisms (Alster, 1989); and
- Demands better site management to gain the benefits of the craftsmen's flexibility (Carley *et al.*, 2003).

Multiskilling is prevalent in several construction sectors. For example, in the USA craftsmen reported the chief motivators towards multiskilling as the need for continuity of employment; more challenging work; interest in a different trade; easier work physically through progression to supervisory roles; and higher wages (Carley et al., 2003). In the UK, multiskilling is also motivated by the need to overcome the narrowing of craftsmen skills due to skill fragmentation (Clarke and Wall, 1998a). Clearly, the advantages for multiskilling of craftsmen are many and accrue to both the employers and the workers.

The multiskills that a craftsman acquires are generally classified according to skill complexity, trade similarities and timing of the needs for skills. In other words, skills tend to be overlapped most advantageously according to commonality in material used and schedule demands (Haas et al., 2001). For example, it is common for skills associated with the use of cement (e.g. screeding, masonry, and plastering) to form a multiskill category or for those associated with wood (e.g. carpentry, joinery, ceiling fixing, shop fitting, and formwork construction) to form a separate category. In the USA construction sector effective trade clusters for multiskilled craftsmen combine crafts with complimentary workloads so that craftsmen arrive on the project site and remain longer by working on multiple tasks before demobilising e.g. carpenter and pipe worker or iron worker and structural steel erector (Burleson et al., 1998). Alternatively, multiskill crafts are classified to reflect the major phases of a project e.g. the mechanical craft classification include insulation workers, millwrights, pipe workers, and welders (Ibid.).

Consequently, three basic forms of multiskilling among construction craftsmen are distinguishable (Clarke and Wall, 1998a). Firstly, there is the broadly skilled craftsman who is potentially able to undertake the range of work in a wide skill category e.g. a mason who executes stone, brick and block laying, tiling, screeding, plastering and abstract skills like setting out, reading drawings, and interfacing different site processes. Secondly, there is the craftsman with a core skill to which additional skills are 'bolted on', popular in maintenance work and small jobs e.g. the carpenter who can do some painting and tiling. Finally, there is the jobbing builder or 'jack of all trades' who combines a mix of skills from diverse trade areas but is a master of none, commonly know as the 'handyman' and generally used in maintenance works. This last category is generally unrecognised as skilled in the construction sector.

Kenya's Industrial Training Act (ROK, 1983) does not explicitly prohibit a craftsman from multiskilling and allows those interested to undergo trade testing in more that one trade. However, such multiskilling is at the discretion of the DIT director who is vested with powers to allow or reject any such trade testing application. While there are no data to indicate how many such applications have been processed, the DIT does not offer multiskilling courses at its institutions nor does it keep records of

multiskilled craftsmen. This may be an indication that multiskilling is not highly favoured among formally trained craftsmen, their employers and formal training institutions. However, given the declining influence of formal training, the actual status of multiskilling in the sector, particularly amongst informally employed craftsmen, is unknown.

Deskilling of craftsmen

Deskilling can be defined as the progressive degradation of work. It occurs when all elements of knowledge, responsibility and judgement are taken from the worker, making his tasks more programmed, routinised and specialised (Braverman, 1974; Wood, 1982). Deskilling is thought to be a natural progression as a consequence of the transformation from craft system to modern organisation of work, particularly under capitalistic production influences (*Ibid.*). Another school of thought maintains that, instead of deskilling, occupations merely go through status redefinition or boundary shift (Diprete, 1988). Such arguments maintain that occupations are internally heterogeneous with respect to tasks located within them, hence making over-time comparisons difficult. Furthermore, the shared boundaries between hierarchically related occupations are socially defined and hence can vary over time. Despite the differences in emphasis, there is a consensus that occupations change over time due to decline in the demand for tasks allocated to them. Accordingly, this research considers deskilling to be the change in the component tasks of an occupation causing a shift in its boundaries.

Among construction craftsmen, deskilling occurs via several routes, including (Clarke, 1992a);

- The taking away of some skills from an occupation or trade thereby degrading it. This occurs when skills that were formally part of a given craft are taken away and allocated to others;
- The deterioration of the craftsman's skills due to non-utilisation, for example during unemployment;
- The disregarding of craftsmen by allowing unskilled workers to execute work;
- Changes in the labour process leading to the devaluation of certain skills. For instance, the increased use of prefabricated components reduces the

work of the craftsman on site to fixing only, hence devaluing his skills (see Dainty *et al.*, 2005);

- Changes in the boundaries of recognised skills where one trade is allowed to do the work of another; and
- The use of production oriented forms of engagement e.g. piecework, that deny the craftsman time to apply his skill to the highest level of craftsmanship hence inevitably degrading his skills.

Accordingly, deskilling may lead to the reorganisation of construction craftsmen skill requirements that may entail the emergence of new trades and/or the modification of the range of tasks within existing trades. The impact of such alterations requires periodic investigation. Like multiskilling, there is no data available on the extent of deskilling among construction craftsmen in Kenya. Moreover, the DIT does not recognise or accredit any skill specialisms although anecdotal evidence suggests that it exists.

SUMMARY

Human capital is an economic resource whose return can be enhanced via skills development. Such skills development is accomplished by training that has a return to all stakeholders. Skills development is especially important as a tool to enhance the economic development of Sub-Saharan Africa. Accordingly, the chapter has focused on the issues affecting the training of construction craftsmen, particularly the determinants of the types of skills they acquire with special emphasis on the Kenyan sector. Some of the general lessons highlighted include;

- Training of construction craftsmen that result in skills development is important because it enhances their significant role in the site production phase of construction. This, in turn, impacts on the sector's ability to ensure customer satisfaction;
- The training of construction craftsmen is influenced by the historical background of the respective sector which may lead to the co-existence of diverse methods of skilling. Each construction sector aims at devising an appropriate training system to meet its needs; and,

- The skills required of construction craftsmen vary with the uniqueness of the respective construction sector as dictated by its work environment. Changes in the work environment may lead to the growth of new skills or trades; deskilling of existing trades; and multiskilling creating a need for the periodic mapping of skill requirements.

With reference to Kenya, the types of craft skills prevalent are influenced by practises in the UK and, hence, tend to be closely related to traditional craft profiles. These skills were designed to meet the needs of the formal construction sector where craftsmen are directly employed by contractors. Over the past 20 years, however, the work environment of the craftsmen has changed as a result of the decline in formal demand for construction leading to an increase in casualisation coupled with the concurrent growth of the informal procurement system. These changes have led to an increase in informal employment of craftsmen, potentially altering the skills they require to fulfil their work responsibility; hence suggesting that their skill requirements have modified. Moreover, for the informally employed craftsmen, multiskilling would in theory be more desirable in view of its advantages coupled with the possibility of allowing the developers to employ fewer workmen hence reducing labour management costs. As with other sectors, it is possible that the demands of the new work environment have led to deskilling, hence altering the existing craft skill profiles. All the above possibilities indicate the need for a mapping exercise aimed at establishing current craft skill profiles.

Accordingly, this study will focus on the mapping of the types of skills that informally employed craftsmen are acquiring as a reflection the needs of their changing work environment and, consequently, contemporary market requirements. Specifically the study will address the following questions which are subsets of the main research questions in Section 1.2;

- Are the skills afforded by the formal traditional crafts style sufficient for the informal craftsmen's work responsibilities?
- Do informally employed craftsmen require any additional skills? If yes what are these skills?
- Has there been growth of new trades?
- Have some skills become obsolete?

- Is there evidence of multiskilling? What form does it take?
- Have the changes in work environment led to the deskilling of existing trades? What are the emerging specialisms?

By establishing the craft skills requirements in the Kenyan construction sector, the mapping exercise will form a basis for the possible review of training programs to make them more responsive to market needs. The mapping of craftsmen skills is only one component of a skills development system. The second equally important part is the method of skilling via which the skills are propagated. Both components have potentially been affected by the changing work environment of the craftsmen, hence impacting the effectiveness of the training system. The latter is covered in the next chapter.

CHAPTER THREE – SKILLS ACQUISITION

INTRODUCTION

This chapter seeks to appraise the training experiences of construction craftsmen in construction sectors of other countries and their applicability in Kenya by exploring the modes of skill acquisition among craftsmen; the existing skilling methods in Kenya, and the possible interventions by stakeholders to enhance training. The chapter consists of three sections;

- Section *One* describes the two ideal types of construction craftsmen training identified from the literature, highlighting their advantages and differences; and the formal training system in Kenya compared to these ideal types.
- Section *Two* discusses issues relating to skills provision, including the regulation of formal skills training among craftsmen in Kenya by the Directorate of Industrial Training (DIT). Additionally, apprenticeship, informal skilling and skills upgrading methods are considered.
- Section *Three* discusses various interventions that can be used by stakeholders to ensure the appropriate delivery of training to craftsmen, including financing training, and the roles of employee organisations and private trainers in facilitating training.

The chapter closes with a summary of the various research issues to be investigated.

3.1 METHODS OF SKILL ACQUISITION AMONG CRAFTSMEN

The training of craftsmen varies between countries. Whilst all training systems endeavour to equip the craftsmen with relevant trade skills, some systems go further and train the craftsmen in generic or general knowledge skills such as setting out, and reading drawings. This latter system produces a craftsman that is more versatile and able to adapt to the changing work environment while the former is designed to get the craftsman to an operational standard within the shortest possible time (Clarke and Wall, 1998b). The presence of the training system is a function of the traditions in particular sectors, the costs of implementation and

agreements/action of the stakeholders, namely, the state, training institutions, employer and employee representatives.

From the literature (e.g. Streeck and Hilbert, 1991; Clarke and Wall, 1998b), two major approaches or philosophies of training craftsmen are identifiable. The first views craftsmen as part of the wider construction sector and hence endeavours to equip them with general construction knowledge in addition to the trade skills. In the alternative approach, the craftsman is deemed to be entering a specific craft, thus limiting his training to the tasks required to work in the respective trade. These philosophies train craftsmen who, although skilled in similar trades, exhibit significantly diverse workplace responsibilities and requirements creating two distinct ideal types. Here, the term 'ideal types' denotes entities constructed hypothetically from component elements with a view of making comparisons and developing theoretical explanations; out of the components, a 'type' is constructed that emphasises the characteristics of the group that are combined to form a coherent whole (Bullock *et al.*, 1988).

Ideal type I

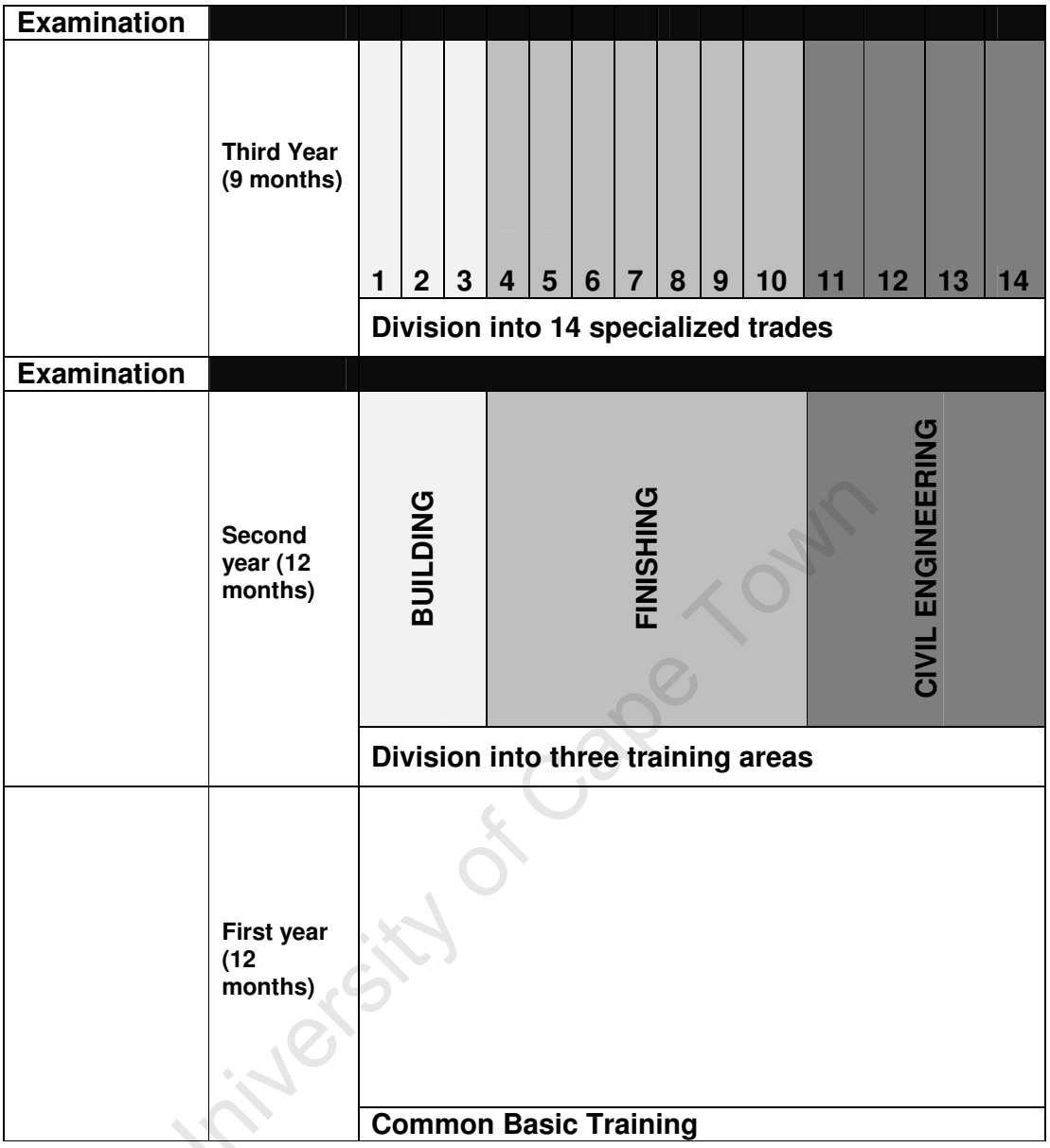
In this ideal type the approach to training is sector-wide hence the craftsmen are prepared to enter the construction sector (Williams, 1963; Clarke and Wall, 1998b). Accordingly, an underpinning general knowledge is taught to all trainees followed by gradual specialisation in the desired trades (Streeck and Hilbert, 1991; Clarke and Wall, 1998b). This general knowledge aims at equipping the craftsmen with flexible transferable skills created through theoretical and educational grounding. It is broad-based and non-trade specific, affording all craft trainees a broad introduction to the sector practices beyond the confines of any traditional trade e.g. applied mathematics, setting out, reading drawings, environmental studies, power tools, health and safety, and organisation and structure of the sector (Syben, 1998; Clarke and Wall, 2000). The general knowledge better prepares trainees to cope with changing work environments and prepares them for multiskilling as they can tackle a range of non-trade specific activities (Burleson *et al.*, 1998; Richter, 1998).

Under this ideal type there is broad induction covering a range of areas leading to broad skill areas. The skills accorded to traditional trades are thus broadened as

they are modified to adapt to changes in processes (Streeck and Hilbert, 1991). Additionally, this system of integrated training recognises the need for different trades to work closely on the building site, hence it emphasises the appreciation of the work of other trades (*Ibid.)*. This appreciation has the added advantage of facilitating improved management and organisation of site production works. Consequently, the craftsmen produced in this ideal type are able to take responsibility for planning, carrying out and controlling their own work since the comprehensive skills allow them to work autonomously with only general instructions (less supervision) as they take responsibility for the management of the interfaces with other trades (Steedman, 1993; Syben, 1998; Clarke and Wall, 2000). Moreover, due to their broad training, craftsmen in this ideal type are more productive because they can be utilised to temporarily perform tasks of other trades or to prepare the ground for more specialised craftsmen during the slack periods (Streeck and Hilbert, 1991). Furthermore, this form of training affords smooth progression into supervisory roles since the craftsman will be more knowledgeable about broader construction processes encompassing the work of all trades (Franklin, 1973; Clarke and Wall, 1998b). This ideal type has led to the gradual moving away from 'learning on-the-job' which was common in the traditional craft training, as trainees access to wider knowledge base is best taught off-site in a classroom setting (Streeck and Hilbert, 1991). In addition, the trainees are tested in all three areas of academic, technical and practical proficiency.

An example of this approach is the integrated training scheme of Germany shown Figure 3.1 below (Streeck and Hilbert, 1991). Under this system, all trainees undergo a common first year of basic training and in the second year those pursuing similar and related trades are instructed together. It is only in the third year that the trainees specialise in their chosen trades.

Another example of this ideal type is in the Netherlands where training is divided into 16 trades, broadly grouped under woodwork, masonry, concrete work, prefabricated components and specialisms (Clarke and Wall, 1998b). Due to the wide range of skills training in this ideal type, few site activities remain outside the realm of the craftsman and thus there are relatively few construction labourers (Clarke, 2005).



Trades: 1 Bricklayer 2 Concrete & armoured concrete builder 3 Furnace and Chimney builder 4 Carpenter 5 Concrete, stone & terrazzo maker 6 Stucco maker 7 Tiler	8 Floor finisher 9 Insulation builder 10 Dry construction assembler 11 Road builder 12 Pipeline builder 13 Canal builder 14 Well builder
Note: Cladder and building sealer trades have subsequently been added as specialisms (Clarke and Wall, 1998b)	

Figure 3. 1: Integrated training scheme in Germany
Source: Adopted from Streeck and Hilbert (1991)

Adequate training of craftsmen requires that the trainees be exposed to all the types of work and different tasks within their chosen trade. This is a problematic requirement where the increased specialisation of many construction firms increasingly means that they are less likely to perform all the different types of work that a trainee is required to experience (Clarke and Wall, 1998b). This may lead to a situation where a trainee must move between employers in order to gain his required experience. This has further been exacerbated by casualisation of employment of qualified craftsmen that makes supervision of the trainees difficult (*Ibid*). To address these challenges, training in this ideal type tends to be offered in three locations; in the firm where the trainee is exposed to tasks within their trade; on training sites where the trainee is exposed to a variety of types of works that they could have missed during the firm training; and at college where the theoretical modules are taught (Clarke and Wall, 1998b; Grugulis, 2003). Graduates from this training system thus combine technical and academic knowledge with practical hands-on experience useful for their working life in the construction sector rather than to a specific workplace. Accordingly, this form of training has been argued by many (e.g. Steedman and Hawkins, 1994; Clarke and Wall, 1998a; Gill *et al*., 2000; Clarke and Christopher, 2004) to be a more effective model of skills development among construction craftsmen compared to the other common ideal type which focuses on workplace behaviour.

The ideal type I format of training craftsmen has been adopted as the main form of training in several countries including Germany (Streeck and Hilbert, 1991), Sweden (Clarke and Wall, 1998b), the Netherlands (*Ibid.)*, Denmark (*Ibid.)*, and the USA (Contren, 2006). Moreover, in Hong Kong, this form of training has been proposed as a way to enhance the employability and future career development of craftsmen (Tang, 2001). In addition, many studies on construction craft training in the UK (CSSC, 1989; Clarke *et al*., 1994; Gann and Senker, 1998; Clarke, 2005) have also recommended the ideal type I approach to training in a bid to counter some of the weaknesses of the ideal type II approach.

In all the countries that this ideal type of training is operational, all the stakeholders; the trade union representing the employees, the employers and the government, are wholly involved in running, financing and setting the standards (Clarke and Wall,

1998b). This requires that all these institutions be effective, with well-developed regulatory and administrative mechanisms. It is herein where the challenge of implementing this ideal type of training in developing countries lies as they are typically characterised by the absence of strong and well established trade unions and employers organisations (Gill *et al*., 2000). As an example, the majority of craftsmen in Kenya operate in the informal construction sector and are not members of the construction workers' trade union weakening its position (Wachira, 2001). Moreover, traditionally, trade unions, do not recruit self-employed operatives from the informal sector because they are unable to sustain their membership during periods when they do not have work and the workers themselves are unwilling to part with their limited earnings (*Ibid.)*. Additionally, the majority of employers in the informal construction system are *ad hoc* consumers of construction services who do not belong to any association. To exacerbate the situation, the government has no forum for engaging with the informal sector whose players they do not recognise. Together these characteristics present a challenge for any form of tripartite agreement necessary as a prerequisite to the implementation of this system of training.

The most significant obstacle to implementing ideal type I training in middle and low level income countries, however, is its prohibitive cost which typically exceeds that for university education. Therefore, this format of training tends to be more successful in high income countries where resources are less limited *(Gill et al., 2000)*. Gill *et al*. (2000) highlights other difficulties for developing countries implementing this system of training. In Korea, firms provided little training to the apprentices whom they used as low-paid low-skilled workers; there were few college tutors sufficiently skilled to make up for the deficit in firm training; the initiative received little financial support from the stakeholders; and seniority rather than skill remained the main basis of promotion (*Ibid*.). In Indonesia, trainees preferred general education to vocational education and employers were not keen to offer apprenticeships which they deemed unprofitable (*Ibid*.). In Egypt, the system could not be implemented on a wide scale because of the predominance of small and micro enterprises which, even in developed nations, rarely take on trainees due to the prohibitive training costs. Additionally, the Egyptian training system was planned and supervised by the government and did not elicit any significant support from

large employers (*Ibid.*). These experiences demonstrate the kinds of difficulties faced when implementing this system of training in developing countries without customising it and suggest that success will occur only by adopting the features that are compatible and affordable to the individual situations (*Ibid.*).

Ideal type II

The alternative type of craftsmen training is where the trainee learns only skills that are related and relevant to his specific trade of interest with no underpinning general knowledge. Training here is concerned with the individual's knowledge of particular tasks which are added together to constitute the skill (Clarke and Wall, 1998b). Accordingly, skill areas are defined and demarcated on the basis of an aggregate of physical, observable tasks involved in a particular trade as exemplified by the behaviour of a competent worker in the workplace. For example, a carpenter will only learn woodwork related tasks e.g. how to construct various woodwork joints, how to use the various woodwork tools. This is typical of employer-led training, focusing only on the tasks the craftsman performs and his output and is intended to bring the trainee up to an operational standard in the shortest time (Arhani *et al.*, 2003). However, where the workplace does not optimally utilise the skills, this system of training may reflect and reproduce existing weaknesses (Grugulis, 2003). Ironically, even construction employers who advocate this system of training appear to be dissatisfied with it as 50% of employers in UK report problems with skills of new recruits and 20% with the skills of the existing workforce (Clarke, 2006). The number of skills specialisms in this system of training keeps increasing often related to a very narrow range of tasks as exemplified by the UK's fifty different National Vocational Qualifications (NVQs) available to construction craftsmen spread over three levels of attainment (Clarke and Wall, 1998b).

Drawbacks have been observed in this system of training craftsmen. Due to the narrow definition of skills, an increasing number of site production activities exist outside the scope of training provisions e.g. groundwork, concreting, machine operation, and cladding (Steedman and Hawkins, 1994; Clarke and Wall, 1998b; Clarke, 2005). Such activities, whilst requiring considerable skill and knowledge, are carried out by the 'labourers' who offer no assurance that the work is properly and safely executed (CIB, 1998; Clarke, 2006). This system thus leads to the use of a

high proportion of informally trained labourers who possess skills that are unrecognised (Clarke and Wall, 2000). Consequently, ideal type II training translates into high site labour intensity as shown in a study of housing construction which found that England sites require 39% more labour to produce one square metre compared to Germany, and 50% more compared to Denmark (Clarke and Herrmann, 2004). Moreover, the excessive reliance on labourers calls into question the necessity of investing in the training of skilled craftsmen who no longer form the bulk of site production work, further eroding the incentive to train. Secondly, this type of training, by strictly demarcating the skills, ignores the increasing overlaps between trades on site e.g. bricklaying, plastering and tiling are different skills but have multiple interfaces (Clarke, 2005). This impedes improved management and organisation of site production.

The narrow, less theoretical initial trade training poses considerable obstacles to further promotion of the craftsmen as it produces craftsmen who lack the underpinning knowledge (e.g. mathematics, English and general science) that can hinder their career development and advancement (CIB, 1998; Gann and Senker, 1998; Kappia *et al.*, 2007). Furthermore, the lack of underpinning knowledge of craftsmen demands higher levels of supervision as they are unable to work autonomously and rely on management to coordinate the interfaces between the trades (Clarke, 1992a; Steedman and Hawkins, 1994; Clarke and Wall, 2000).

Other drawbacks include the training systems' tendency to de-motivate craftsmen from seeking to improve their skills by accrediting them for what they can do already; and the training systems' disregard of evidence from countries e.g. Germany and the Netherlands, that shows that better craftsmen training may occur through incremental improvement of bottom-up processes (CIB, 1998; Gann and Senker, 1998).

Ideal type II training aligns with practices in the UK and many other countries that have close historical links to the UK due to its imperial history. Many of these countries, including Kenya and South Africa, adopted the UK systems wholesale (or had them imposed on them) with few modifications and consequently face many of the same problems as the UK. Moreover, the changing work environment in the

different sectors has had a negative impact of the operation of various aspects of the training ideal type particularly where such changes differ from the UK experience. This has, in turn, led to inefficiency in the craftsmen training systems with consequent decline and/or collapse of the same in countries like Kenya (DIT, 2008g).

Kenyan practice

As in the UK, Kenya's formal craftsmen training system follows the ideal type II format. Accordingly, the training of construction craftsmen is primarily directed by their traditional employers, the contracting organisations, and exhibits all the drawbacks. However, due to the growth of informal construction, craftsmen in Kenya are now largely directly engaged by private developers rather than contractors. These developers do not, however, contribute to the formal training system and so do not influence the training ideal type. Therefore, the Kenyan ideal type can not be labelled as strictly employer-led.

The major challenge to this system of training in Kenya is the emergence of a market that prefers craftsmen with broad skills and who are able to work autonomously. This shift in the market requirement is driven by changes in the work environment of the craftsmen as a consequence of the increasing casualisation and the informal procurement system. Increased casualisation suggests that craftsmen with broad skills are likely to find more continuous employment. Likewise, the absence of the general contractor in the informal procurement system requires the craftsmen to work autonomously (Wachira *et al.*, 2007). In addition, the lead craftsman in the latter system requires broad skills to supervise the work of other craftsmen (*Ibid.*). Consequently, it is plausible that the ideal type II training system as it exists in Kenya is out of alignment with the general needs and development of the building labour.

3.2 SKILLS PROVISION

Craft training provision

Although it is possible to describe two ideal types, the need to respond to the specific demands of each respective construction sector means that the provision of

training for construction craftsmen varies all over the world. Moreover, the learning context, learning process and expertise of the instructors vary and impact on the success of the schemes (Gann and Senker, 1998). Notwithstanding this, all training schemes share some characteristics. These are explored below.

Practical training

Because employers value the practical capability of the craftsman who is hired mainly for his ability to perform the required tasks as part of the site production process, appropriate craft training provision tends to emphasise practical training whether on-the-job or in trainee workshops. Consequently, where practical training is lacking it negatively impacts on the employability of the craftsman. In the UK, employers are reported as being generally sceptical of the skills of trainees who acquire college based National Vocational Qualifications (NVQs) without having had the opportunity to obtain site experience and are reluctant to employ them (CIB, 1998). This has also been reported with formally trained craftsmen in Kenya (King, 1977). Moreover, there is evidence that employers engaged in training are generally those who employ directly because they can offer practical site experience (Gann and Senker, 1998). However, as the work environment of the craftsman changes, theoretical knowledge becomes increasingly valuable by enabling craftsmen to cope with changes in the construction process caused by new materials, technologies and processes (Clarke, 1992a). In addition, theoretical training lays a foundation for additional specialised trade skills. The increasing need for theoretical knowledge among craftsmen contrasts sharply with many employer-led training systems that emphasise practical performance. The concern expressed in the UK is that the NVQ's emphasis on practical skills has devalued theoretical knowledge and understanding to the detriment of the craftsman and his ability to perform efficiently in contemporary sites (Gann and Senker, 1998). Consequently, appropriate contemporary training provision requires a balance of both theoretical knowledge and practical skills.

Quality assurance

A craft training system must be able to guarantee consistency in the standards achieved by its graduates; to provide the employers with quality assurance; to help the sector secure an increasingly skilled workforce; to improve the attractiveness of the sector to higher calibre entrants; and to assure customers that skills are

available to deliver the service on offer (CIB, 1998). Additionally, accreditation helps employers vet the suitability of employees; provides workers with portable credentials; and gives groups bargaining power (Grugulis, 2003). Accreditation should only be awarded to only those who can demonstrate evidence of competence in defined workplace tasks. Failure to guarantee standards undermines the credibility of the training process and of its graduates. Indeed, one of the problems employers reported with the current UK training scheme, was inconsistency in the standards of the assessors that allowed candidates who should have failed the tests to pass (CIB, 1998).

Adequate supply

Any training scheme should aim at providing a sufficient number of craftsmen to meet the needs of its respective sector. The existence of skill shortages, as exemplified by the difficulty experienced by employers in recruitment, suggests a weakness in training provision. In the Zambian construction sector, plant operators, scaffolders, crane operators, electricians and plant mechanics were reported to be difficult to recruit (Muya *et al.*, 2006a). These trades are highly technical and are not offered at any trade school. In such situations the training provision would require a shift in focus towards the skills in short supply.

Technological efficiency

In developing nations, training provision should also enhance the sector's capacity to utilise technology. This requires the training scheme to impart an intrinsic capacity for the generation, assimilation, adaptation and utilization of technology (Imbert, 1990). This, in turn, would enhance the efficiency of the construction sector.

Skill upgrading

The need for skill upgrading is also an important part of training provision. Skill upgrading focuses on updating existing skills to avoid obsolescence, improve productivity, tackle new tasks and responsibilities, or respond to technical and structural changes in the work environment (Ziderman, 2003). Skill upgrading ensures that craftsmen are equipped with relevant skills to cope with changing work environments.

Stakeholder involvement

Finally, the provision of craftsmen skills necessitates the inclusion of all the stakeholders, namely, the employers, employees, trainers and the state, in the planning and implementation of the training scheme (Gill *et al.*, 2000). This is crucial to ensure the support and consequently the success of skills provision (*Ibid.)*. Taken together, these issues, if appropriately considered, should help the chances of success of any training scheme.

Craftsmen's training provision in Kenya

In Kenya, the training of craftsmen engaged in the construction sector is enabled by legislation, namely, the Industrial Training Act Chapter 237 (ROK, 1983). The Act created the Director of Industrial Training, the National Industrial Training Council, and Training Committees to oversee training in various sectors including construction. The three bodies established by the Act work together to regulate, monitor and standardise training for all industrial sectors in Kenya in a similar fashion to Industrial Training Boards in other countries (e.g. CITB in UK) (Agapiou, 1998).

As with many other countries, the Industrial Training Act envisaged the training of industry workers to be a tripartite effort of employers, employees and the state. The National Industrial Training Council (NITC) and the sector specific Training Committees, composed of the stakeholders' representatives, formulate the general training policies. The NTIC's mandate is to:

1. Secure the greatest possible improvement in quality and efficiency of training personnel engaged in industry;
2. Ensure supply of properly trained personnel at all levels of industry;
3. Share the cost of training as evenly as possible among employers; and
4. Perform trade testing and certification (ROK, 1983).

The Training Committees under each sector identify the training and skill needs of their sector, draw up training schemes and recommend (for approval of the Minister of Labour) the amount of sector-specific training levy chargeable to employers (*Ibid.*). The third statutory authority, the Director of Industrial Training, is charged

with the day-to-day running of the Directorate of Industrial Training (DIT), which is the main arm for the Act's implementation.

The Industrial Training Act was designed for the formal sector and generally replicates craft training practices in the UK where training provision is mainly via contracting firms. However, the declining demand for formal construction services, coupled with the concurrent rise of informal procurement, presents several challenges. These chiefly emanate from the Act's inability to cope with changes in the engagement and relationships of craftsmen and their employers. These trends, as in other countries, have undermined the efficacy of social dialogue and collective bargaining on which the Act was based and which traditionally provided a mechanism for the provision of training (ILO, 2001; Clarke, 2005) and raised barriers to formal training through joint training schemes.

The Act's emphasis on employer-led training has been adversely affected by the erosion of employer's motivation to train. The Act only recognises contracting firms who are members of the Federation of Kenya Employers (FKE) as employers *cum* practical trainers of craftsmen (DIT, 2008c). Consequently, as the formal demand for construction services declined and became more volatile, contractors shed labour and casualisation and self-employment increased. Employers' demand for training reduced because the return on their investment could not be guaranteed, leading to the collapse of the formal training system (DIT, 2008g). Similar trends have been reported in other countries with comparable experiences [e.g. in the UK trainee numbers declined from 84,000 in 1970 to 46,000 in 1990 (Clarke, 2005) and in South Africa from 5697 in 1970 to 769 in 1990 (Cattell *et al.*, 1996)] also arising from the casualisation and self-employment phenomenon.

The effective exclusion of informal employers from the Training Committees prevented them from contributing and participating in the sector's training agenda. Under the current arrangements the construction sector's craftsmen skills requirements are defined by the Building Construction & Civil Engineering Industries Training Committee, where only contractors are represented. These skill requirements are used by the curriculum development section of DIT to design training programs, including writing or revising the syllabi, setting minimum

standards for training institutions, setting minimum entry qualifications, and setting job skill assessment guidelines (DIT, 2008f). Consequently, contractor-led skills development dominates the training. Such skills emphasise the contractors' business objectives which are generally achieved via task-based approaches and hence encompass narrow firm-specific skills, mainly traditional crafts (Clarke, 2005; Chan and Dainty, 2007) because contractors typically engage craftsmen under direction and supervision and hence only require trade specific skills.

Understandably, therefore, the current DIT craftsmen skill profiles are skewed towards trade specific skills at the expense of more transferable generic and job management skills. In the contemporary Kenyan construction sector, however, the informal construction employer, and not the contractor, is the largest employer of craftsmen particularly in the building sub-sector (ROK, 1980 - 2007). It is possible, therefore, that the informal construction employer, without being aware of it, is occupying the leading role of defining the craftsmen skill requirements in reality, if not within the formal training system. Given that informal employers' engagement with craftsmen under informal procurement is by nature different from their employment by contracting firms, it is plausible that their skill requirements are more diverse e.g. informal employers require a more versatile craftsman capable of independent work and capable of advising a lay client on issues relating to estimation of time and materials, and determination of technology (Wachira *et al.*, 2007). Such skills are unaddressed by contractor-led training leading to a mismatch between skills training and actual requirements.

Further exacerbating matters is the fact that craftsmen engaged by non-levy contributing employers (generally all informal employers) are not entitled to participate in DIT training programs (DIT, 2008f). This further alienates the informal employer and craftsman from the training system. Moreover, given the fact that the informal construction sector is expanding, whilst training by contractors is in decline, it is plausible that the craftsmen are acquiring skills via methods other than those envisaged under the training Act. The formal training of craftsmen therefore does not enjoy the support of all stakeholders contributing to its decline and undermining the legitimacy of formal trade tests as a basis of vetting craftsmen.

Likewise, there is a lack of representation of the majority of craftsmen in the Training Committee. The employees' representatives to the Building Construction & Civil Engineering Industries Training Committee are all drawn from the Central Organisation of Trade Unions (COTU) on the assumption that the craftsmen are members of the Kenya Building, Construction, Timber, Furniture and Allied Industries Employees Union (KBCTFAIEU) (DIT, 2008a). However, trade unions in Kenya do not recruit informal sector operators or self-employed workers because, under the Trade Unions Act Chapter 233 (ROK, 1984), union members have to have formal contracts of employment which are only granted to permanently employed workers who in turn consistently pay their subscription fees via payroll check-off systems (Wachira, 2001). In contrast, the informal craftsmen's terms of engagement are at best temporary oral agreements and hence they are rarely on the payroll. Additionally, many employers in both the formal and informal construction sectors do not adhere to the minimum wage and terms of employment guidelines (the principle benefit of union membership) and the Ministry of Labour does not have the resources to police compliance (Wachira, 2001). This makes union membership unappealing to informally employed craftsmen and thus the union is unlikely to advocate their training needs.

The declining worker representation in training formulation forums is a concern in other constructions sectors too. For example, in the UK, although the CITB originally had a 50-50 representation from the trade union and employer association, union representation has declined to two out of a total of twenty four members (Clarke, 2005) indicating that craftsmen's training is increasingly employer-led to the exclusion of other stakeholders and their needs.

The minimum requirements set for craft apprenticeships exclude many informal construction craftsmen who do not meet the criteria. The requirements target trainees who have a minimum academic qualification of secondary school education (DIT, 2008c). Yet the realities of the employment market are such that most of those seeking production work in the construction sector are primary school graduates (King, 1977). Moreover, employers are reluctant to train secondary school graduates who tend to leave the training firms more frequently for other formal jobs and object to the low wages paid during apprenticeships and the

absence of coherent career structures in many firms (*Ibid.*). The Act thus does not reflect the actual academic level of most construction craftsmen.

The lack of standard tool kits also handicaps informal craftsmen during trade testing. Trade testing requires that the prospective craftsman exhibits skill proficiency in handling and selecting tools in addition to providing the necessary standard tools for the test (ROK, 1983). This provision suits formal apprentices trained on formal sites that emphasise procedural correctness and whose employers are required to fund their tools acquisition (DIT, 2008b). However, for the informal craftsman, particularly those trained via the Indian style that emphasises improvisation of the few available tools (as explained in Chapter 2), this requirement may work against him as he may not have access to or be able to select the most appropriate tool in a standard kit during testing. Consequently, the informal craftsman may avoid the trade testing particularly if it is accompanied by difficulties in raising the prescribed fee (DIT, 2008d).

The unregulated wage structure devalues accreditation and skill upgrading. Sectors where the wage structure is unregulated typically display more indifference to qualifications, hence accreditation is not a prerequisite to claiming skilled status (Clarke and Wall, 1998b). Moreover, output based forms of engagement, e.g. piece-work, by emphasising the ability of the craftsman to complete the task in the shortest time, tend to overlook the craftsman's qualification, quality, range of skills (*Ibid.*). Consequently, the prevalence of casualisation and self-employment that favour output-based forms of engagement, coupled with the inability to police adherence to regulated minimum wages, has devalued formal qualifications and the upgrading of skills in Kenya and few craftsmen are motivated to seek formal training and trade testing.

Finally, and more generally, is the effect of the conflict created by the lack of critical evaluation of DIT's training programs. Such conflicts are typical of a public institution that combines the triple role of allocating training funds, providing training and regulating the training system (Ziderman, 2003). In such circumstances, the quality of training is often negatively affected allowing the perpetuation of the provision of outdated skills that are averse to the needs of the market as has been

observed in countries such as Tanzania and Mauritius (*Ibid.*). Indicative of this is the continued use of construction crafts trade test syllabuses that were formulated in 1963 by the DIT (ROK, 1963). Moreover, public training institutions like DIT tend to suffer from inertia as a consequence of centralised authority which makes it difficult for them to respond promptly to local concerns because, *inter alia,* of the difficulty in redeploying permanent staff engaged in instructing obsolete skills (Dougherty and Tan, 1999).

These challenges highlight the need to overhaul the Kenyan system, but Kenya is not alone in this and can learn from the experience of other countries. Other construction sectors faced with similar challenges have proposed solutions to specific training formats such as apprenticeship or have introduced competence based training and these are considered below.

Apprenticeship

Apprenticeship broadly refers to the gaining of knowledge and skill over a specified period of time in order to practice a specialised trade, craft or art. It is a common method of entering occupations which demand extended initial training located in the workplace and is the traditional way that the majority of craftsmen in all countries acquire skills (Dougherty and Tan, 1999; ILO, 2001; Clarke and Christopher, 2004). The Industrial Training Act (ROK, 1983:3) defines an apprentice as;

"A person who is bound by a written contract to serve an employer for a determined period of not less than four years or such lesser period as the Council shall determine, with a view to acquiring knowledge, including theory and practice, of a trade in which the employer is reciprocally bound to instruct that person."

Under Kenyan law, an apprenticeship is a formal arrangement for the initial development of skills embodying the following features (O'Connor and Harvey, 2001; DIT, 2008c);

- Systematic and long-term skill development to enable entry into a recognised and marketable skill/occupation;
- Training for a transferable skill with the apprentice earning a wage during the training period;

- Centred on on-the-job training in an enterprise in addition to instruction at an institution for theoretical education; and,
- Involvement of a legal contract of indenture between the trainee and employer or training body.

Traditional apprenticeship in many European countries was initiated as a mode of training young persons (about 16 years) for a craft by attaching them to a master craftsman for a specified length of time (usually 3 to 7 years) regardless of the level of competency achieved (Williams, 1963; O'Connor and Harvey, 2001). By emphasising initiation to the craft via observation, imitation and gradual participation, rather than theoretical knowledge requiring more stringent academic input, apprenticeship suits situations characterised by a high intake of entrants with low education levels (Clarke and Christopher, 2004; Muya *et al.*, 2006a), arguably a characteristic of the construction sector crafts. Moreover, it is viewed as a way for firms to secure their future workforce as the apprentice may continue to work for the firm upon qualification (Arhani et al., 2003).

The apprenticeship system provides a means of overcoming the problem of the worker financing the training in transferable craftsmen skills (Stevens, 1999). In the early part of the apprenticeship, the employer incurs the costs of training since the apprentice is unproductive, but recoups these costs in the latter part by paying a lower market wage to the now productive, but still contractually bound, apprentice, without fear of him leaving. Effectively, therefore, the apprentice commits himself to paying back the training loan from the employer by allowing him a time bounded claim on his human capital with no risk of default (Dougherty and Tan, 1999; Stevens, 1999). Alternatively, the apprentice may be required to pay training fees typically in the form of initial lump sum to the trainer (Dougherty and Tan, 1999).

The Kenyan Industrial Training Act advocates traditional apprenticeship as the main mode of craftsmen training (ROK, 1983). The Apprenticeship Training Scheme, regulated by the technical section of DIT, sets out the requirements for employers and apprentices; registers and administers the apprentice contract; supervises the training; and reimburses training expenses (DIT, 2008c). Craft apprentices must be

at least 18 years of age (the age of majority in Kenya); have a minimum academic qualification of Kenya Certificate of Secondary Education (KCSE) to ensure that they have the educational background necessary for the theoretical training offered by DIT institutions; have employer sponsorship that affords training in the practical aspects of the trade; and lastly, be physically, mentally and medically fit for the respective trade (Ibid.).

Employers are required to seek permission to employ apprentices from the DIT and demonstrate their suitability for training via registration as trainers, and by being fully paid up levy contributors (ROK, 1983 section 6 (1&2)). Other employer conditions include; being bound to pay the stipulated apprentice wage; using the best means to teach and instruct the apprentice; providing the apprentice with the necessary tools and materials; and lastly, releasing the apprentice to attend supplementary classes (DIT, 2008c). The DIT compensates the employer for the training expenses incurred, such as monthly wages, tuition and examination fees, accommodation and travelling expenses, transfer allowances, and learning materials like basic tools, equipments, protective clothing and books, using the training levy funds (DIT, 2008b). Moreover, the employer has no obligation to offer the apprentice employment on completion of the contract nor can he bond the latter (DIT, 2008c).

Like other ideal type II trade specific training, the DIT apprenticeship training accentuates practical training alongside minimal theoretical input (DIT, 2008c). Practical training is offered by the employer under supervision by a DIT training officer usually for 9 of the 12 months in each training year. The other three months consists of supplementary craft course training conducted at DIT training centres or other approved institutions. The latter comprises 70% practical training to compensate for skills that are not available at the employer's firms and 30% theoretical training related to the trade. To ensure that the employers provide genuine training, the progress of the apprentice is assessed via practical and theoretical proficiency tests at the end of each training year, although such tests are not conducted by independent parties and are administered at the employer's premises, thus risking collusion (Ziderman, 2003; DIT, 2008c). At the end of the training the apprentice is issued a final certificate of proficiency by the employer but is not required to sit the national trade tests (ROK, 1983).

The traditional apprenticeship such as that pursued under the Industrial Training Act have declined in many countries such as Australia, the UK and Ireland, due to doubts over their efficacy (Clarke, 1992a; Stevens, 1999; Toner, 2000; O'Connor and Harvey, 2001). These doubts include the inflexibility of the apprenticeship contracts; potential exploitation of the apprentices by employers as cheap labour; craft unions' use of apprenticeship as a means of controlling the supply of skilled labour; inadequate facilities in many training workshops due to specialisation; weakness in training supervision; and the fact that the apprentices did not undergo any independent testing to attest to the quality of training (*Ibid.*). This final point has been particularly contentious, with many employers insisting that craftsman status should be attained only by passing a trade test rather than merely by effluxion of time which offers no guarantee of quality of craftsmanship (Clarke, 1992a; O'Connor and Harvey, 2001). Another drawback of apprenticeships is its reliance on the goodwill of individual employers as to whether to take on the apprentice or not (Clarke, 1992a; Arhani *et al.*, 2003). When an employer's goodwill or motivation is eroded, this voluntarist training collapses. Although, the DIT has attempted to address some of these weakness, its success is undocumented and the reluctance of many employers to recruit apprentices may be deemed to be an indicator of the system's inappropriateness.

One way of addressing the reliance on employers would be to indenture apprentices to the construction sector rather than individual employers. This would allow apprentices to transfer to whatever employer had work and afford exposure to a variety of tasks (HSRC, 1985). This system has been advocated at various times both in the UK and South Africa (HSRC, 1985; Clarke, 2005) and may be a plausible option where high levels of self-employment exist and where many craft trainees aspire to self-employment (Kappia et al., 2007).

The weakness of the traditional apprenticeship system led to the introduction of a 'modern apprenticeship' in many countries (Clarke and Wall, 1998b). The modern apprenticeship was devised around the attainment of specified job competencies by apprentices rather than time served. Modern apprenticeship is thus competence-based, combining both formal off-the-job and on-the-job training and includes assessment of both (O'Connor and Harvey, 2001). It lasts until the trainee achieves

the required qualification e.g. in the UK, the National Craft Certification or NVQ in the chosen trade which generally takes three years (*Ibid.*). Modern apprenticeships, however, removed the all-important ability of the employer to recoup his training costs eroding his motivation to invest in the training. To address this, it has been suggested that a worker, having left a job within some specified time after training, be required to repay a proportion of the training costs (Stevens, 1999). However, difficulties in verifying the monetary value of the training provided have rendered this impractical (*Ibid.*). A second criticism is that apprentices still receive minimal college input which results in craftsmen with minimal theoretical and technical knowledge. It is thus viewed as emphasising the traditional learning-by-doing which is seen as unsuitable for modern construction techniques (Clarke and Christopher, 2004).

Likewise, in South Africa, the Manpower Training Act of 1981 led to a transformation of the traditional apprenticeship in a similar way to the UK (HSRC, 1985). The South African model is more flexible than the UK model as it allows an apprentice to shorten the apprenticeship period by passing a trade test, and provides for the certification of those who do not pass the test as 'improvers' or 'uncertified artisans' (*Ibid.*). Moreover, the apprentice is required to keep a logbook of work done as an indication of exposure to the various tasks within the trade.

Clearly, there is no consensus on what constitutes appropriate apprenticeship or on its suitability as the primary model of vocational training amongst construction craftsmen (Clarke and Christopher, 2004). Contrary to all the efforts being made to make apprenticeship a more appropriate system of training in other countries, in Kenya no intervention has been proposed to-date to replace the collapsed apprenticeship system.

Competence based training (CBT)

Another form of craftsmen training is the competence based training practiced in many countries including the UK and South Africa. This is a non-continuous mode of craftsmen skills training which recognises the prior acquired skills and competencies of the worker. Under this training system the craftsman qualifies through demonstration of competencies in as many modules as he/she wishes. Thus it has an inbuilt scope for education and skills upgrading (English, 2002a).

In South Africa's Competence Based Modular Training (CBMT), the craftsmen's modules are taken in succession hence those who do not complete the whole range of modules required to attain full craftsman status can be granted recognition as limited or specialised skilled workers (Cattell *et al.*, 1996; Prinsloo and Watters, 1996; Cattell, 1997). Successful completion of each module is based on two criteria: firstly, the training performance criteria tests that test target times for the completion of modules of work; secondly, the production performance tests that target faster times for completing the same modules. Full craftsman status is achieved via the completion of all the designated modules at the training performance target times, passing two trade theory courses at the technical college and passing the trade test (*Ibid.)*. CBMT was developed to counter the weaknesses of the traditional apprenticeship and to allow craftsmen with limited education to rise to the highest possible level of competence (Prinsloo and Watters, 1996).

Criticisms levelled at CBMT were that it required literate trainees because the technical college admission demanded a minimum of 9 years schooling; it entailed employers paying fees and sending employees to training institutions interfering with the work output; it had a narrow definition of skill, ignoring generic skills like adaptability, flexibility and problem solving; and was unsuitable for self-employed craftsmen (Cattell *et al.*, 1996; Prinsloo and Watters, 1996). The CBMT in South Africa has subsequently been replaced by the National Qualifications Framework (NQF) which is also a CBT program. NQF gives credits for learning outcomes or competencies earned through fulltime or part time study, distance learning, work-based learning or a combination of all or any of these methods (Cattell, 1997). Under the NQF, training in construction trades is divided into various levels with N2 (NQF level 2) representing the National Certificate for top level craftsmanship (English, 2002a).

The National Vocational Qualification (NVQ) of the UK is a similar form of competence based training in that it assesses the levels of competence and skill required of a worker to perform activities in the workplace (Stevens, 1999). An NVQ level is thus a measure of the individual's competence in carrying out a range of work to standards agreed by the sector intended to facilitate entry into, or progression, in employment (CSSC, 1989; Agapiou, 1998). It was meant to provide

a unified framework for assessment and certification of skills by allowing for the recognition of competence irrespective of the way it was acquired (formally or informally) and to improve the standing of vocational qualifications with employers (Ibid). Additionally, NVQ allows each trainee to progress through the levels at a rate that suits their individual abilities (Shackleton et al., 1995). For construction craftsmen, it has three levels with NVQ level 3 being the highest (Agapiou, 1998).

Downsides of the NVQ system include; the assessment and training is relatively more expensive as it requires the trainers to have adequate facilities (Agapiou, 1998); the materials used are expensive and not reusable (*Ibid.*); the emphasis on job performance sacrifices general job knowledge (*Ibid.*); it severely constrains the general educational content e.g. mathematics (Agapiou, 1998; Stevens, 1999); holders lack underpinning knowledge that hinders their career advancement (CIB, 1998; Gann and Senker, 1998); by certifying existing competences it does not encourage the craftsmen to improve (CIB, 1998); it tends to replicate current systems of work design and skill utilisation which may not be optimal (Grugulis, 2003); and it ignores the training process by creating qualifications separate from training provision (Clarke and Wall, 1998b).

As with formal apprenticeships, the major challenge of implementing the CBT system of training for construction craftsmen in Kenya would be its employer-led nature, particularly the difficulties in agreeing employment competencies given the different practices of formal and informal employers. The apprenticeship and CBT mode of skilling are mainly utilised in the formal skilling of craftsmen, ignoring 'informal' competencies. As a response to this, in many countries, most notably developing countries like Kenya, the growth of the informal sector has seen an emergence of an informal skills development system to meet that sector's needs.

Informal skill training

Informal skills training, which includes informal apprenticeship, is an *ad hoc* and unsystematic method of learning on-the-job received within the context of day-to-day production activities (Middleton *et al.*, 1991). It mainly involves work-shadowing where an experienced worker monitors and observes the trainee as he/she assimilates the skill and knowledge necessary to carry out work activities, providing

instruction and assistance when necessary (Loosemore *et al.*, 2003). It is largely confined to initial employment training with limited continuing training and skill upgrading (Middleton *et al.*, 1991). Informal skills training is geared towards the transmission of existing practices with minimal external input (e.g. from colleges) and hence is limited to the master's current skill and knowledge and so often results in low productivity (Ziderman, 2003).

Informal skilling is a significant skills development vehicle in many developing countries. This role is driven by the contracting employment opportunities in the formal sector coupled with high population growth rates that force many job seekers to enter and develop their skills in the informal sector (Ziderman, 2003). In addition, informal skill training is common among young people who, for various reasons, are unable to progress up the academic ladder; or who can not gain admission to vocational training institutions (Kent and Mushi, 1995; Johanson and Adams, 2004). Furthermore, informal skills training is attractive to developing nations because it is self-financing in that it takes place without government funding or levies, relying instead on user fees or the low wages of apprentices during their training (Ziderman, 2003). Its popularity is evidenced by the fact that, in Kenya, the informal sector is estimated to be training more school leavers than the vocational training institutions (Barasa and Kaabwe, 2001).

Informal skilling of craftsmen is common in the construction sectors of many developing countries, including the Philippines, Indonesia, Egypt, India, Mexico and Brazil (ILO, 2001; Alwi *et al.*, 2006). In Iran 95% of the craftsmen are trained informally (Zakeri *et al.*, 1996), 80% in Sri Lanka (Jayawardane and Gunawardena, 1998) and 90% in China (Sha and Jiang, 2003). It also exists amongst developed nations e.g. in the USA, where it accounts for 76% of craft training (Rowings *et al.*, 1996). Although specific data from Kenya are not available, it is likely that following the collapse of formal training, similar trends have resulted in similar outcomes.

Its popularity notwithstanding, no single blueprint or best practice exists for training in the informal sector, hence any intervention must be customised to the needs of the respective sector and the existing local realities (McGrath *et al.*, 1995). Moreover, many planners and policy makers in developing countries tend to ignore

informal skilling, assuming that institutionalised training is more cost-effective although there is no supporting evidence of this (Dougherty and Tan, 1999). Due to its prevalence, informal skilling ought to be prioritised and included in the training policies of developing countries. In addition, its scope should be assessed to evaluate the degree to which it complements other forms of skill development (*Ibid.*).

Informal skills development is, by definition, unregulated and exhibits the following characteristics (Kent and Mushi, 1995; McGrath *et al.*, 1995; Van der Klink and Streumer, 2002);

- Entry into training has little or no emphasis on academic qualifications and is open to an illiterate workforce;
- There is no standard cost of training or set fees, with little commonality in the charges among providers within similar skill areas or trades. Training is paid for either by a lump sum (which maybe converted into monthly instalments) or via the acceptance of low wages during training;
- The training utilises an ad hoc curriculum with no prescribed syllabus, subject content or method of assessment. Theoretical knowledge is ignored with training revolving around workplace instruction only;
- Training providers have no formal qualifications either as tradesmen or as trainers, with many of the 'masters' having also acquired their skills informally;
- Pedagogy is limited to learning-by-doing (trial and error) and is based on tacit knowledge with little use of diagrams, books or models. The trainee's learning is dependent on the work in progress and the relationship is founded on 'master and man' rather than 'teacher and pupil'. Additionally, little emphasis is paid to the creation of a healthy and safe work environment or on the safe use and correct selection of tools and materials;
- The progress and capability of the trainee/apprentice is dependent on the level of instruction necessary to enable him to work unsupervised and no value is given to independent assessments; and,
- Training is suited for self-employment, accentuating getting the job done rather than procedural correctness. By the end of the training the trainee has

gained some work experience and has established links with potential informal employers.

However, informal skills training faces challenges arising from these characteristics, including (Franklin, 1973; Middleton et al., 1991; Kent and Mushi, 1995; McGrath et al., 1995; Barasa and Kaabwe, 2001; Ziderman, 2003);

- The narrow and static range of skills offered in this training system has difficulty accommodating technological change and skills enhancement. This limits the marketability of graduates as existing techniques become obsolete; perpetuates traditional techniques that may not be optimal; and demands high levels of supervision (see also Cattell, 1997);
- Restricted opportunity for learning to work effectively due to the use of learning-by-doing, coupled with instructing by providers lacking both teaching and certified trade skills. This is most prevalent where the masters/trainers have limited skill and often leads to a diversity of qualifications and competencies even within the same occupation with limited scope for standardisation of both the method of skilling and the graduate;
- The minimal knowledge of materials (behaviour and characteristics) and processes may affect the quality, reliability and safety of use of the final product;
- The minimal theoretical knowledge and ad hoc curriculum erodes the necessary foundation for new skills, thus making it difficult to learn particularly in dealing with new materials and technology; and,
- Lack of standardised training and independent testing makes it difficult to control the quality of the training. There is a lack of appropriate scale of equivalence by which the knowledge and skills acquired can be externally vetted; hence the competence of the graduates is difficult to judge. The consumer of the services has no guarantee of what he is purchasing.

Due to these weaknesses informally trained craftsmen are usually deemed to be inadequately skilled. In the USA informally trained craftsmen are deemed to be eroding the elite status of the various trades via their doubtful proficiency and their narrow skills, increase their likelihood of being unemployed, and act as a barrier to

their progression to supervisory roles (Franklin, 1973). In the Kenyan construction sector informally skilled craftsmen are not formally recognised as skilled and do not benefit from wage regulations, but are categorised as labourers. However, anecdotal evidence indicates that informally skilled craftsmen are widely engaged in the informal construction sector and as casual employees in the formal sector. Clearly, the perception of inadequacy is limited to employment in formal government institutions and other formal organisations where wage regulation is strictly followed. This further supports the existence of two markets with diverse requirements and hence differing training needs.

Several recommendations have been suggested to address the challenges of informal skilling. These include (Harper, 1989; King, 1989; Kent and Mushi, 1995; McGrath et al., 1995; Afenyadu et al., 2001);

- The formulation of a comprehensive training program that focuses on developing worker flexibility: via depth, providing a through grounding in knowledge and skills of a particular trade; breadth, by providing opportunities for craftsmen to gain awareness and some understanding of the various activities taking place around them; and relevance, by preparing trainees for work by alluding to the context and resources used in the informal sector;
- The enhancement of the skills the worker has already acquired by allowing the participant to select courses that address his interests and needs, and incorporation of life skills like basic literacy and numeracy;
- Targeting already practising operatives who require specific skills and new technologies rather then new entrants in a bid to change the existing practices;
- Aiming at improving the practises in the informal sector rather than focusing on formalisation, by addressing the weaknesses without changing the dynamics of the informal sector;
- Be accompanied by necessary tools and processes to allow the beneficiaries to practice the acquired skills;
- The instructors must be willing to learn existing informal techniques as a basis for additional training to make the training of immediate practical relevance, otherwise the informal craftsmen are likely to oppose it; and

- The training itself should be short and intensive, preferably through evening courses.

These recommendations highlight the need for any informal training intervention to be aware of the skill needs of the potential trainees and to incorporate their views in the planning process. The trainee's skill needs may be identified by establishing the kinds of skill they are acquiring as an indication of their training interests, the market requirement (informal operators acquire only marketable skills) and what skills need enhancement.

Just-in-time training

Just-in-time (JIT) training is a form of informal skills training for craftsmen where the craftsman receives one-on-one instruction at the workplace on how to complete the task at hand efficiently and effectively without compromising quality (Alwi *et al.*, 2006). JIT training involves instructing the craftsman on how to identify errors in the work as early as possible and to report the same to the supervisor. In Indonesian case studies (*Ibid.*) the length of training at the site lasted between 30 minutes and one hour depending on the complexity of the task at hand. Training was divided into two phases: the first involved explanations of the materials, methods, and tools to be used; quality of workmanship expected; and any waste activities. In the second, the instructor demonstrated accomplishing the task correctly while allowing the trainee to practice. As in other forms of informal skilling, JIT training is closely related to the current or planned work of the trainee. JIT training benefits include increased numbers of completed planned construction activities whilst minimising fluctuations in output and a decline in waste because the trainees are able to accomplish the tasks correctly (*Ibid.*). JIT has not been tried in the Kenyan construction sector but its usefulness may be limited by the lack of competent supervisors to instruct the craftsmen, particularly under the informal procurement system.

Skills upgrading

Skills upgrading is an important part of training provision that focuses on workmen who are already employed or practicing a given trade. It is aimed at maintaining a skilled up-to-date workforce via the enhancement of their existing skills or equipping them with new skills in response to changes of technology, materials and processes

in their work environment (CSSC, 1989; CIB, 1998; Loosemore *et al.*, 2003). In many construction sectors, the craftsman's progression, represented by skills upgrading, is reflected by the award of additional qualifications that are usually accompanied by increased earning power. In the UK, craftsmen progress from NVQ level one to three and in Kenya from Grade 3 to 1. Despite its importance, skills upgrading of craftsmen is rarely given much emphasis. Skills upgrading is not part of the collective agreement in the UK and usually takes the form of occasional short courses in health and safety or extra trade training at the discretion of the employer (Clarke and Wall, 1998b). Moreover, the absence of any clear career progression from craft level into supervisory positions in many construction sectors, demotivates craftsmen from pursuing additional learning (Clarke and Wall, 1998b).

In Kenya, the DIT offers skill upgrading courses in all recognised trades mainly targeting craftsmen trained informally. Courses are offered at three levels namely;

- Basic courses that target KCPE graduates or 'Jua Kali' (informal) craftsmen with a work experience of two years in the relevant trade. This course prepares the trainees for trade test grade 3;
- Intermediate courses for those who have passed the basic course; or have passed grade 3 trade test; or have at least two years relevant training or industrial experience which includes the ability to interpret engineering drawings. Here trainees are prepared for trade test grade 2; and,
- Advanced courses that require applicants to have at least three years training or industrial experience plus the ability to draw and interpret basic engineering drawings; or to have passed trade test grade 2; or to have passed the intermediate level skill upgrading training. Graduates of this skill upgrading can attempt trade test grade 1 which is equivalent to master craftsmanship.

At the end of training the craftsman is awarded a certificate of attendance and encouraged to attempt the relevant DIT trade test. Unlike formal apprenticeship which requires applicants to have a minimum of secondary school education, the skill upgrading system targets primary school graduates and informal craftsmen. This may be viewed as DIT's attempt to reach out to those who are informally

trained by offering them a chance to acquire formally accredited qualifications. However, the upgrading training may not be attractive to informal craftsmen because of its rigidity. The DIT skill upgrading does not recognise prior learning of informally engaged craftsmen who are expected to commence training at the basic level even with two years experience in the trade indicating that the informal craftsmen are assumed by the DIT to have no recognisable skill. This seems both unreasonable and unrealistic and probably reflects the DIT's attitude towards informally acquired skills. Moreover, the training does not allow the craftsman to commence training at a level of his choice or to select modules they deem useful or relevant. The minimal levels of engagement between DIT and informal employers and craftsmen also raises doubt of the latter's ability to devise courses that reflect the skill needs of the informal construction sector.

The duration of all the courses is 120 hours, each typically divided into 6 weeks of evening classes (DIT, 2008e). Evening classes are intended to cater for those who are unable to obtain full day release from their workplaces. The training cost for the each of the upgrading courses consists of a tuition fee of KS 7,000 (US$ 112.9); a refundable caution fee of KS 1,000 (US$ 16.1); and an optional accommodation fee of KS 10,000 (US$ 161.3). To encourage levy-paying employers to send their employees for skill upgrading, the costs of training are reimbursable (DIT, 2008b). Since, as in formal apprenticeship, the cost reimbursement inevitably excludes informally employed craftsmen, it is plausible that the cost of skill upgrading is an additional barrier to the participation of informal craftsmen.

Training the Trainers

Aside from trade skill upgrading, a much ignored skill upgrade for the craftsman-cum-instructor is the training of trainers; that is, equipping craftsmen with the skills necessary to conduct on-site training and assessment. In many construction sectors such as those in the UK and Kenya, trade competence and experience are deemed to be sufficient qualifications for on-site instruction ignoring the need for trainer skills (Clarke and Wall, 1998a). There is, however, increasing recognition of the need for trainer skills; for example, in The Netherlands, all site trainers are required to be accredited after undertaking a course in pedagogy and in Germany only a *Meister* whose training includes skills in trainer aptitude is allowed to train

(*Ibid.)*. This training-of-trainers standardises the training of potential craftsmen as well as improving the efficiency of the learning process.

Impact of mode of engagement on training provision

The mode of engagement of craftsmen has a direct impact on training provision because construction craftsmanship is learned mainly via on-the-job instruction. The on-the-job training is usually imparted by the skilled craftsman-cum-instructor; hence it is important that the instructor be able to take time out of the production duties to instruct the apprentice/trainee. Accordingly, different modes of engagement impact the training environments differently.

Direct employment is most suited to apprenticeship and other forms of on-the-job training. This is because direct employment tends to be more permanent and stable, guaranteeing continuous and consistent instruction for apprentices and trainees (Clarke, 2005). In the UK trainees are found only in firms which maintain direct employment of operatives and the decline in the number of trainees in the UK (and Kenya) was concurrent with the decline in direct employment (Clarke and Wall, 1998a). Therefore, the prevalence of casualisation and self-employment as a main form of craftsmen engagement undermines the stable training environment (Clarke, 1992a; Clarke and Wall, 1998a; Wells, 1999; Clarke, 2005; DIT, 2006). Consequently, in many construction sectors, employers are encouraged to revert to direct employment in a bid to increase craftsmen training e.g. in the UK via initiatives like 'Investors In People' or via changes to tax arrangements which undermine the popularity of self-employment (Mackenzie *et al.*, 2000). In Kenya, however, no similar interventions have been initiated despite the collapse of formal apprenticeship.

Conversely, output-based employment such as piecework undermines the training environment. Output-based engagement is founded on the output and performance of the craftsman which determines the period of employment and hence the wages payable (Clarke, 2005; Clarke, 2006). This focus on production relegates training to a secondary duty for the craftsmen, particularly where the craftsman is not compensated for the time taken to train (Clarke and Wall, 1998a). Accordingly, piecework, common in construction sectors with high levels of casualisation and

self-employed forms of engagement, reduce the availability of training places and the quality of training on the site (Rainbird, 1991; Streeck and Hilbert, 1991). Clearly, output-based forms of employment do not in themselves provide an infrastructure for their own reproduction (Clarke, 1992b).

Moreover, where piecework-engaged craftsmen take on trainees, the emphasis of the training is on production rather than developing the trainee's skill potential. This implies that training is limited to the minimum skill required to improve the output of the trainee (Winch, 1998; Clarke and Christopher, 2004). The training is thus biased and may utilise inappropriate and unsafe methods of work in a bid to maximise output. The focus on the trainee's output is illustrated by the practice of determining the apprentices wage relative to their productive output compared to that of a craftsman (Clarke and Christopher, 2004). For example, the DIT specifies that the monthly wage for an apprentice will be pegged to 50%, 60% and 70% of the wage of a grade 1 craftsman during the first, second and third year of apprenticeship, respectively (DIT, 2008c). The change in percentage reflects the apprentice's increased productivity as he gains more skill.

Since the mode of craftsmen engagement has such an impact on the provision of training, as the former changes, there is inevitably going to be a need to devise new modes of training or to formulate interventions that can guarantee the continued supply of adequate skills in the sector.

3.3 INTERVENTIONS BY STAKEHOLDERS

Training delivery requirements

As explained in Chapter 2, Section 1, the benefits of training accrue to all stakeholders thus the stakeholders will often intervene in the training delivery systems. Such interventions are aimed at formulating training systems with the following characteristics (Ziderman, 2003):

- Effective in offering meaningful quality skills which are useful and appropriate for the market;
- Efficient in terms of cost so that they are affordable to the majority;

- Competitive to counter supply driven demands so that graduates can easily find gainful engagement;
- Flexible to meet short term changes in scope and direction of training; and,
- Responsive to meet changing market demands so they continually offer skills that are relevant to the market.

Since the operating environment is not static, training delivery systems need to be periodically evaluated to asses their relevance, effectiveness and impact of the training in terms of content and design, changes in learners and organisational payoffs (Alvarez *et al.*, 2004). Moreover, training evaluation helps to improve the training process by reviewing contents and procedures to make them more appropriate and to justify training investment (Hashim, 2001). Specifically, training evaluation addresses the following criteria (Loosemore *et al.*, 2003);

- How effective was the training approach in delivering the desired learning outcome in the individual; and,
- How has the training impacted on the performance of the sector in terms of achieving its objectives.

Evaluation can be accomplished by collecting the opinions of the people involved in the training (trainers and trainees) and the consumers of the services offered by the trainees, as an indication of their satisfaction with the skills acquired.

In Kenya this evaluation process takes place is via the consultations in the Building Construction & Civil Engineering Industries Training Committee. However, this only looks at formal craftsmen training and the committee's exclusion of informal craftsmen and their employers casts doubt on its ability to reflect the opinions and needs of all the stakeholders. The sector's continued adherence to the formal apprenticeship mode of training, despite evidence that it is increasingly ineffective as reflected by the dwindling number of apprentice recruits, is a case in point (DIT, 2008g). There is clearly a need for a more inclusive training evaluation particularly to identify the obstacles that preclude informal craftsmen's participation in training e.g. scheduling of the training, language of instruction and training content.

In addition to training evaluation, successful training delivery demands an understanding of the modes of learning best suited for the learners. Construction craftsmen are typically adult learners, hence their learning is characterised by (Cheetham and Chivers, 2001);

- a preference for self-directed autonomous learning;
- learning best through experiential methods;
- awareness of their individual learning needs;
- their need to apply new knowledge/skills to their circumstances;
- viewing learning as a partnership between teachers and learners; and,
- the use of their experience as a resource in the learning process.

Any training delivery for construction craftsmen must take cognisance of these characteristics.

Training delivery interventions

There are two basic approaches to training; the voluntary and regulatory. The voluntarist approach assumes that to remain competitive, produce quality goods and run efficiently, firms will of their own volition invest in appropriate training targeted to meet market needs (Grugulis, 2007). Such an approach deems regulation unnecessary and it is practiced in countries such as UK and the USA. However, the voluntarist approach is negatively impacted by economic cycles and changes in construction processes that affect the motivation of the firm to train. The broadly voluntary craftsmen's training in Kenya has been negatively impacted by the erosion of the employers' motivation to train. In contrast, the regulated approach assumes that, left to their own devices, firms will prioritise profitability and may not invest in skills development (*Ibid.*). Here, the State supports and regulates training for the public good as practiced in most of continental Europe (Netherlands, France, Germany, Austria, Denmark, and Switzerland). Under state intervention, the regulated training system guarantees continuous training in the sector, irrespective of the prevailing economic conditions. In essence it is an attempt to mitigate for market failure. Given the market failure that has taken place in Kenya, this may suggest that some form of state intervention may be desirable for appropriate

training delivery although its nature and form would have to reflect the realities of the context.

The most important stakeholder intervention to address training deficiencies is in measures to stimulate training demand. Such measures make training delivery self-sustaining and can originate from diverse sources. Firstly, demand for training can be driven by government policies regulating training or motivating employers to increase training. The enactment of the Industrial Training Act 1964 in the UK compelled firms to increase expenditure on the training of their employees (Stevens, 1999) although subsequent initiatives have shifted the balance back towards the market and a shared responsibility between individuals and employers. Likewise, in South Africa, the Industrial Training Act 1964 was replaced by the Manpower Training Act 1981 (HSRC, 1985). Currently in South Africa, the training of craftsmen is under the Construction Education and Training Authority (CETA) which similarly emphasises training as a joint responsibility between firms and individuals (CIDB, 2004). In Kenya the government enacted a similar Industrial Training Act Cap 237 in 1964 (ROK, 1983).

In contrast to the UK and South Africa, however, the training system in Kenya has not been reviewed and still perceives training as the responsibility of the employers. This has exacerbated the erosion of their motivation to training compared to other countries who have revised their regulatory frameworks. Governments can additionally stimulate demand for training via other legislation e.g. environmental and health and safety laws. Environmental concerns, e.g. pollution, increase the need for training particularly given that pollution problems are often caused by ignorance (CIB, 1998). In the same way, the need for improvements in health and safety can stimulate demand for training to equip and sensitise the craftsmen to observe acceptable practices (*Ibid.*). In Kenya, the Environmental Management and Co-ordination Act (ROK, 1990) highlighted construction as a significant source of environmental degradation while health and safety issues are covered under the Factory Act Cap 514 (ROK, 1951). Such legislation, however, only stimulates training if they are up-to-date and are accompanied by stringent policing of adherence coupled with hefty fines for non-compliance. This is not always the case in developing countries.

Clients can stimulate demand for training if, in their pursuit of better value for money, they demand high quality, high productivity, and high skills from the construction sector (Agapiou, 1998; CIB, 1998; Gann and Senker, 1998). These demands may be fulfilled by the clients' insistence on minimum competency levels of the craftsmen who impact the quality of the final product. This is mainly accomplished via the use of preferential procurement systems that may be skewed to favour employers that train (Dainty *et al.*, 2004). In the informal procurement system this would translate into clients hiring appropriately trained craftsmen. For instance, client interventions to stimulate demand for training have been suggested for the Sri Lankan and Chinese construction sectors where craftsmen training is low (Jayawardane and Gunawardena, 1998; Sha and Jiang, 2003).

Manufacturers and suppliers also stimulate demand for training via their pressurising for training to meet the skill needs required to work with the new products and technologies that they are seeking to introduce into the marketplace e.g. new materials, fixings, tools, components, plant and equipment, and use of IT (CIB, 1998; Gann and Senker, 1998). These new technologies cause shifts in traditional craft practices, requiring the retraining of craftsmen (*Ibid.*). Manufacturers therefore lobby the training institutions or formulate their own training programs for the craftsmen. The liberalisation of the Kenyan economy, coupled with the effects of globalisation, has introduced new construction technologies. However, no formal retraining initiatives appear to have been undertaken although some component and material distributors informally offer specific training to their clients' craftsmen. For example, Basco paints, have committed to train 300 painters to help impart professional painting skills in view of its expanded range of products (Nation Reporter, 2007). There is thus potential for greater involvement of manufacturers in craftsmen training.

Other interventions to address the deficiencies of training programs have been proposed: the establishment of in-house or on-the-job programs in the form of short courses, workshops and seminars (Imbert, 1990), although these are unlikely to fundamentally change the skill base (Grugulis, 2007). In UK the most commonly funded training is health and safety and induction, which, although important, is

unlikely to significantly affect productivity, quality and career development of the participants (*Ibid.*).

Another intervention is the crash program. Proposed as a means of quick skilling of construction craftsmen in South Africa to stem shortages (Cattell *et al.*, 1996), it allows adult trainees to gain full craftsmanship in 12 months and youths in 14 months plus a month to prepare for the trade test. Like other forms of craftsmen training the crash training program combined practical and theoretical training with site experience. This kind of intervention is, however, not meant to be sustained over long periods but acts as an emergency redress to a crisis situation.

The use of mobile training units that offer on-site training has been recommended in South Africa (Cattell, 1997; English, 2002b). Mobile training units are akin to an extension service that entails regular visits to the sites with a mobile workshop to provide training specific to the immediate work needs of already skilled craftsmen (Herschbach, 1989). The success of mobile training depends on the ability of those manning the workshop to address the needs of the user's successfully. For construction craftsmen this may entail having instructors in all the trades or having versatile (multiskilled) instructors. The mobile training unit has a high unit cost because of the geographical limitation of those served and may require charging consultation fees to defray the cost (*Ibid.*) and this may preclude their use in Kenya. Clearly many interventions can be utilised to enhance craftsmen training.

Financing training

Training is a costly endeavour and hence the consideration of its financing is a major source of stakeholder intervention. Training funding is necessary to cover the various direct costs (including the provision of suitable teaching facilities e.g. workshops, classrooms, tools, and materials; compensation for the instructors and administrators for their time) and indirect costs (e.g. the forgone productivity by the trainee during training and trainee allowances) (Ziderman, 1975; Stevens, 1999; Tsang, 1999). The unit cost of the training program depends on the length of the training. Where training facilities are underused because of declining enrolment, e.g. craft training at the DIT, the unit cost of training will increase particularly where it is not accompanied by a reduction in instructors (Tsang, 1999). This may make the

training less affordable. Moreover, in a bid to improve funding efficiency, some countries used outcome-related funding where the training funding is dependent on employment of the graduate, but this has been criticised as leading to the watering-down of the training requirements (Clarke and Wall, 1998a).

Traditionally, the financial burden of training has been shared by all stakeholders who earn a return from such investment (Ziderman, 2003; Johanson and Adams, 2004). The apportionment of the burden of training finance depends on the classification of the skills under consideration as explained under human capital in Chapter 2. Moreover, the apportionment is influenced by the characteristics of the respective sector as explored below.

Trainee/worker training financing

Training can be financed by the trainees/workers via cost sharing where the trainee/worker bears the cost of the training in the form of user fees (Ziderman, 2003). This occurs when the training takes place during the trainees/workers own time through pre-employment training or after working hours (evening or weekend classes); or if the worker forgoes his wages during the training duration (Stevens, 1999). In this form of training financing under-investment in training may be caused by the trainee's inability to finance their share of the training costs. This problem is exacerbated by the poor collateral state of human capital and the trainees' uncertainty of return on the investment (Stevens, 1999). The uncertainty is caused by the absence of an advance guarantee that the trainee has the ability to acquire and exploit the skill of interest, in addition to the possibility of future unemployment that may render him unable to recoup his investment. Moreover, in developing countries, where poverty is widespread, the user fees may lead to added discrimination against those unable to pay (Middleton *et al*., 1991; Ziderman, 2003). In Indonesia, the charging of fees in the formal training programs has been identified as one of the barriers to craftsmen participation (Alwi *et al*., 2006). Consequently, user fees as a form of training financing is only desirable where the training leads to occupations that have the potential for future higher market earnings and greater probability of sustained employment (Ziderman, 2003). It is thus more suitable for white collar occupations than blue collar construction craftsmen jobs. In Kenya, the guarantee of continuous employment among craftsmen has been eroded by

casualisation and the intermittent nature of engagement under the informal procurement system (ILO, 2001; Wachira *et al.*, 2007; Wells, 2007).

The challenge of a trainee's inability to pay user fees can be addressed by the provision of career development loans (Clarke *et al.*, 1994; Stevens, 1999). However, such loans are unsuitable where the training has a substantial on-the-job training element like craftsmanship and for training for occupations whose market prices are difficult to verify (Stevens, 1999). Additionally, such loans require the trainee to pass normal tests of creditworthiness and the loans have to be repaid whether or not the qualifications or subsequent employment is obtained (*Ibid.*). This makes such loans unsuitable for construction craftsmen who are likely to have poor or non-existent credit histories. Tax relief to individuals on training programs can also help trainees pay for skills development (Clarke *et al.*, 1994) but this too presupposes that the beneficiary will have a steady job and is within the tax system. Tax relief is unsuitable for the informal sector operatives who do not pay income taxes either because their incomes fall outside the taxable income bracket or because they seek to evade taxes by remaining in the informal economy.

Accordingly, construction craftsmen trainees and workers are often unsuited for cost sharing financing strategies. The craftsmen, however, indirectly share the cost of training in the form of lower wages paid during the training periods when the trainee's productivity may be higher than their wage (Stevens, 1999).

Employer training financing

When training takes place during employment, either as on-the-job training or via a formal course; or if the employer pays for the training; or the training is conducted during working hours at no charge to the worker; then the training is considered to be employer financed (Stevens, 1999). This form of training is considered to be the most viable and sustainable (Whalley and Ziderman, 1990; Middleton *et al.*, 1991; Ziderman, 2003; Muya *et al.*, 2006b). Accordingly, in many countries, both developed and developing, funding of workforce training is financed mainly by employers via a training levy (Clarke and Wall, 1998a; Ziderman, 2003).

Training levies are the most widely used workforce training financing strategies in Sub-Saharan Africa, having been established in 30 countries including Kenya, Nigeria, South Africa, and Botswana (Ziderman, 2003; Muya *et al.*, 2006a). Under the training levy funding model, employers are obliged to contribute a set amount of money to a common training fund, which is used to fund training programs or to compensate employers that train. The training levy, is an attractive financing option for developing countries where state funding is limited by budgetary constraints and may be used to restructure the labour force towards skill-intensive activities such as has been the case in Singapore (Middleton *et al.*, 1991; Dougherty and Tan, 1999; Ziderman, 2003). .

The training levy may be imposed as a percentage of the gross payroll amounts of all employers in a country. The amounts collected are held in a common pool and distributed to the various economic sectors according to their respective need e.g. in Malaysia, South Africa and Tanzania where the payroll levy currently stands at 1% (Ziderman, 2003). Alternatively, the levy may be sector-specific where each sector determines the amount to be levied on its employers depending on the perceived training need. For example, the Kenyan economy is divided into 11 sectors, each with its unique levy percentage and point of collection (Ziderman, 2003; DIT, 2008c). Sector-specific levies are based on the construct that the cost of training programs differ noticeably between sectors hence the differentiation in levy rates. This allows each sector to focus more directly on its training needs (Whalley and Ziderman, 1990). The training levy monies are expended in funding on-the-job training by firms, subsidies for apprenticeships, or training at accredited institutions. It is notable that countries that pursue the ideal type I form of craftsmen training contribute higher percentages to the training levy than those in the ideal type II system e.g. the Netherlands contributes 4.3%, Germany 2%, compared to the UK 0.29% and South Africa 1% of their respective payrolls (Syben, 1998; Clarke and Wall, 2000; Ziderman, 2003) possible a reflection of the higher cost of the former.

The main challenge of employer financing is under-investment caused by the perception of low returns on such investment leading to competitive disadvantage (Arhani *et al.*, 2003). Additionally, under-investment can be caused by the free-rider or poaching problem especially for skills that are transferable, for example,

construction craftsmen skills. Poaching can be redressed by requiring all employers to invest in training via taxation or grant levies which are paid by all employers but where the funds are used to compensate only those who train (Stevens, 1999). Other redress for employer training under-investment include (*Ibid.*);

- Informing employers about the costs and expected benefits of the training. This would assist the employers in choosing the most appropriate and cost effective training; and,
- Establishing a respected system of vocational qualifications that guarantees that the training achieves the stated objectives.

State training financing

Training funding may also be sourced from the state. Typically such government funding takes the form of granting monies to National Training Authorities or other recognised training institutions which train in the various skills required in the respective economies (Ziderman, 2003). In addition, state training financing is often necessitated by equity and social consideration, particularly for pre-employment training where craft trainees are drawn from the least advantaged in the society in terms of ability and family resources (Dougherty and Tan, 1999; Ziderman, 2003). In many Sub-Saharan Africa countries, however, government funding is under increased pressure due to competing budgetary needs, effects of structural adjustment policies, and poor economic performance (Whalley and Ziderman, 1990; Ziderman, 2003). For example, the government of Zambia only released 44% of the budgeted funding to the Ministry of Science, Technology and Vocational Training in 1998, leading to financial constraints in the trade schools (Muya *et al.*, 2006a). Closely related to state funding is donor funding, which can provide additional training financing. However, this too is in decline as donors change their funding priorities; as was the case of Togo (Ziderman, 2003).

Kenya's government, like many other governments in Sub-Saharan Africa, faces budgetary constraints as it endeavours to alleviate poverty and achieve the millennium development goals. This has created tension between the delivery of basic education and strategies aimed at increased employment such as worker training (King *et al.*, 2007). Consequently, much of the state funding is more cost-effectively directed into general education programs like free primary and secondary

school education rather than to direct worker training programs (Middleton *et al.*, 1991). Investment in quality general education may nevertheless be considered to indirectly contribute to worker training by creating a better foundation for skills development (Middleton *et al.*, 1991; Forrester *et al.*, 1995). It is thus unlikely that the Kenyan government will be willing or able to shoulder any significant burden of craftsmen training particularly considering that the Industrial Training Act (ROK, 1983) does not obligate it to contribute directly to worker training. To date there has been no pressure to modify this status with much of the debate focusing on the need for the government to provide only the regulatory framework.

Financing training of craftsmen in Kenya

The Industrial Training Act (ROK, 1983) was formulated on the premise that training of workers is best achieved and financed by the employers. It emphasises employer-led training in the belief that employers are the best placed to determine the skills they require of the workforce. Accordingly, funding of craftsmen training in Kenya is provided mainly by the employers with minimal contribution from the government or the employees.

The funding of craftsmen training is via the sector levy system. The levy is intended to ensure that the cost of training is shared evenly among employers by requiring all employers pay the levy but reimbursing only those who train. The Building Construction and Civil Engineering Industries Training Committee recommended a training levy equivalent to 0.25% of the contract price or estimated cost of the building, be imposed on all employers in the construction sector. This was given legal backing by the issuance of annual legal notices e.g. notice no. 151/2006 (ROK, 2006) by the Minister of Labour and Human Resource Development. In 2007, the training levy amount in all sectors was modified to a standard KS 50 (US$ 0.75) per employee (including apprentices, and casual workers) per month (ROK, 2007) standardising the training levies across all sectors by converting them to a payroll based system.

Whilst this may make sense at governmental level, the main challenge of craftsmen training financing is the collection of training levy. In the formal construction sector collection of the training levy funds is effective as the parties responsible in the

contracts are easily identified and contract documents, including payrolls, are well kept. However, in the expanding informal sector, projects have minimal documentation and parties have no clear-cut responsibilities. Moreover, informal construction employers do not utilise the services of the general contractor who is the typical levy collection point (Wachira *et al.*, 2007). Coupled with the fact that the informal construction sector generally operates outside the regulations, this makes it logistically difficult to collect the training levy. It thus follows that although the informal construction sector is the biggest employer of craftsmen, it does not contribute to the training levy. This may affect the sustainability of the fund and hence the provision of training in addition to compromising the objective of equitable sharing of training costs.

Voucher schemes

Voucher schemes are an alternative form of training financing that have been tried in the informal sector in Kenya. Voucher schemes have been used to finance training by issuing prospective trainees with training vouchers which allow them to buy training from a provider of their choice (Haan, 2001; Ziderman, 2003). This form of training was piloted in the early 1990s in the Kenyan informal sector via the World Bank sponsored Small Enterprise Training and Technology Project (*Ibid.)*. It targeted small and micro enterprises (1-50 workers) that purchased vouchers to get training at 10-30% of the actual face value and redeemed them with any of the registered training providers. Jua Kali associations, NGOs and others were used as allocating agents to decentralise the implementation.

This method of training, facilitates competitive response from training providers through consumer choice and may encourage improvement of the training offered, in addition to indicating the real training needs of the target group (Ziderman, 2003). The results of the pilot project indicate that private training providers, including self-employed master craftsmen, were the preferred choice of training providers as most of the training vouchers were redeemed with them compared with public training institutions (Haan, 2001; Ziderman, 2003). This suggests that informal sector operators prefer to be trained by those operating under the same circumstances as themselves rather than public training institutions which they may perceive as being

out of touch with their needs in terms of the suitability and relevance of their courses.

The voucher scheme training was not extended to informal construction craftsmen which makes it difficult to know if it would be effective, particularly in view of the limited number of private training institutions. Moreover, the voucher scheme has been criticised for, among other reasons, lack of quality assurance; distortions in the training market due to subsidisation; and doubtful sustainability upon withdrawal of the donor (Haan, 2001).

The role of employee organisations

Employee associations facilitate employee representation at various forums, particularly in sectors characterised by minimal trade union membership. Consequently, they are useful for the informal sector where they can assist in articulating the needs of informal operatives and in seeking out potential donors to fund programs e.g. training (Afenyadu *et al.*, 2001). Moreover, employee associations form a common point of interaction with the individual self-employed operatives thus enhancing the probability of reaching the majority (*Ibid.*). This, in turn, improves the efficiency and effectiveness of any intervention.

Notwithstanding this, employee organisations are rare among informal craftsmen, which suggests that there is a need for external assistance to enable the informal craftsmen incorporate and administer employee organisations. Some of the obstacles to their formation include (Kent and Mushi, 1995);

- Concerns about corruption and embezzlement of funds by elected officials. This highlights the need to establish checks and balances to build trust of the craftsmen;
- The *ad hoc* working practises and irregular working hours result in diverse socio-economic needs among the craftsmen, thereby making it more difficult for them to arrive at a common ground on the regulations, duties and responsibilities of the organisation; and,
- Planning for the future as a work ethic is lacking. This is due to the survivalist nature of many of the jobs in the informal sector that mean that all effort is focused on short-term goals.

Private sector training

Private sector training is desirable as it increases the range of training options and encourages competition that may lead to efficiency in training provision (Ziderman, 2003). Moreover, the increasing difficulty of allocating public funding to worker training in developing nations suggests that policy makers should encourage private sector skills development (Dougherty and Tan, 1999). However, private sector training is generally neglected because of a lack of awareness of its current scale and because of prejudices over the profit motive that is perceived to lead to inferior quality training. Such shortcomings are remediable via regulation (*Ibid.)* among other interventions. Moreover, private sector training can provide additional benefits by; being more cost-effective than its public sector counterparts; mounting courses whose length and content are more closely tailored to the actual market requirement; being more responsive to changes in demand for skills; and maintaining close links with local employers (Dougherty and Tan, 1999). This gives private sector training the potential to enhance training provision.

Across many countries, the private sector succeeds in offering training across many economic sectors particularly in programs that do not require heavy capital outlay and are highly marketable e.g. IT skills. Few private sector providers venture into construction craftsmen training as this requires relatively more capital in the form of workshops, tools and equipments, and in the consumed materials needed for practical instruction (Clarke and Wall, 1998a). Occasionally, large contractors and local authorities do offer such training but this is usually a response to critical skills shortages where there is no alternative (*Ibid*.). Despite this, it may be possible to encourage craftsmen training by the private sector via a favourable policy environment and through incentives e.g. tax rebates on training equipment and material (Middleton *et al*., 1991; Ziderman, 2003). In Kenya, private sector craftsmen's training is offered through NGO's such as the Christian Industrial Training Centres and YMCA craft training.

Informal private sector training institutions are also common in Kenya. These institutions have greater scope for aiding informal sector training due to their lower costs and flexibility but efforts to improve the relevance and quality of their training is

essential (King, 1989). Although, none of these informal training institutions is currently offering construction craftsmen skills, they signify potential particularly in offering the theoretical component of the training.

SUMMARY

This chapter has proposed the existence of two ideal types of craftsmen training in the construction sector. One ideal type emphasises the equipping of the craftsmen with underpinning general-knowledge to which various skills are gradually added while the other emphasis the acquisition of respective specific trade skills only. The existence of either ideal type governs the implementation of craftsmen training in the respective sectors with their consequent advantages and challenges. Yet, the adoption of a particular training ideal type is largely determined by historical factors. However, it is also impacted by changes in the work environment necessitating periodic reviews of its operation.

Such review forms a basis of the formulation of efficient and appropriate craftsmen training models to meet the prevailing market requirements. In Kenya changes in the craftsmen's work environment are driven mainly by the increased casualisation that has eroded the contractors motivation to train coupled with the growth of self-employment under the informal construction sector. Together these are potentially altering the skills needed from craftsmen and suggest that an ideal type I training system would be preferred. However, the limited resources coupled with other outlined obstacles preclude the wholesale implementation of this mode of training and the ideal type II mode of training persists.

Skills provision amongst craftsmen in Kenya is enabled by legislation that was formulated to meet the needs of the formal construction sector. In the past 20 years, however, the efficacy of the legislation has been adversely affected because of the increase in casualisation and growth of self-employment. These phenomena have helped undermine the training infrastructure, leading to a virtual collapse of all forms of formal craft skilling including apprenticeship and skill upgrading in construction. Concurrently, the growth of the informal procurement system suggests

that the demand for craft skills has expanded suggesting that craftsmen are now predominantly acquiring their skills via 'extra-legal' methods.

Stakeholder interventions in the training of craftsmen mainly revolve around the need to make the training responsive to market needs. In addition, interventions stimulate demand-led training and devise appropriate training financing mechanisms. In the contemporary Kenyan construction sector, the training of craftsmen is chiefly impacted by their changing work environment because of the increased casualisation and self-employment. As a result, these changes are impacting the traditional forms of stakeholder interventions thus demanding a review of existing approaches.

Moreover, the Kenyan construction sector is currently dominated by informal operators that function outside the provisions of the existing legal framework. A formal law loses its legitimacy and needs to be changed when the majority of the people are operating 'extralegal' i.e. outside the existing legal provisions (De Soto, 2000). To make a new effective law or policy in this scenario, promoters should not presume to act in a vacuum where nothing exists but should foremost take cognisance of what already exists particularly in sectors where the 'extralegal' has successfully managed to deliver what the legal could not (*Ibid.*). Informally employed craftsmen can be said to be acquiring their skills 'extra legally' because anecdotal evidence suggests that with the collapse of the formal training system, these craftsmen are acquiring skills through systems that are outside the provisions of the existing law. Given that these informally employed craftsmen dominate the construction sector, the Industrial Training Act's effectiveness and legitimacy as a method of skills development has thus been greatly eroded. This highlights the need to review the training approach. The first step in this direction demands that efforts be made to identify how these operators are acquiring their skills as a basis for the formulation of a commonly accepted craftsmen training policy. It is this first step that constitutes the thesis of this research.

Accordingly, this study focuses on establishing the methods of skilling among informally employed craftsmen. In addition, appropriate stakeholder interventions to enhance training delivery will be investigated and compared to the existing as an

indicator of possible obstacles. Specifically the study will address the following questions that are subsets of the main research question in Section 1.2;

- How are the craftsmen acquiring their skills?
- How are the skills upgraded and reproduced?
- Who is financing the training?
- What is the prevalence of membership to employee organisations?
- How are these organisations expected to impact training delivery?
- What is the most suitable training time, venue and language of instruction?

While this study does not aim at developing a training policy, it is anticipated that attempting to answer the questions above will form a basis for the formulation of an all-inclusive sector-wide and appropriate training system for the Kenyan construction craftsmen. Moreover, given the apparent commonality of experiences the study may assist other countries as they seek to review and modify their own training policies.

CHAPTER FOUR – METHODOLOGY AND RESEARCH DESIGN

INTRODUCTION

Chapters 2 and 3 identified skills mapping and skilling methods amongst informally employed craftsmen in Kenya as the main research issues in this study. In this chapter, the research method and data collection methods used to investigate these issues, as well as the study's objectives and research questions, are explained. Given the multiplicity of approaches available to accomplish research, the method selection process demands due consideration to the nature of the research questions posed, the type of data required to address the study's objectives, the characteristics of the respective respondents, and finally, the field conditions, that is, '*research is the art of the possible*' (Patton, 1990 pg. 13). These attributes interact in diverse ways to impact the study.

To explain and make the case for the research method and data collection methods adopted in this study, this chapter is divided into five sections;

- Section *One* introduces the positivist approach to research, explaining the selection of the survey method of research for this study and the factors which influenced the selection of the method of data collection.
- Section *Two* considers the various sources of data for the study, including the delimitation of the working population and determination of the appropriate sample size.
- Section *Three* explains how the questionnaire was designed, indicating the data to be collected to address the research questions and objectives.
- Section *Four* describes the procedures used in the data collection process and explains how the ethical considerations were addressed including pre-testing of the survey instrument.
- Section *Five* explains how the data were captured, coded and analysed using the SPSS for Windows software.

Finally, a diagrammatical representation of the research process used in the study is outlined.

4.1 RESEARCH METHODOLOGY

There has been much discussion about which research method and data collection methods are appropriate for studies in construction management (Rooke *et al.*, 1997; Root *et al.*, 1997; Runeson, 1997; Seymour *et al.*, 1997; Walker, 1997; Harris, 1998; Li and Love, 1998; Raftery, 1998; Seymour *et al.*, 1998; Wing *et al.*, 1998). The discussions have centred on theories of construction problem solving; whether the positivist paradigm is more appropriate than the interpretive; and on the problems and benefits of qualitative studies versus quantative. While no consensus has been achieved on these issues, and no single approach has been shown to guarantee good research, it has always been clear that the research method and data collection methods used in any study should be appropriate for the stated objectives. Given the diversity of construction management research, it is plausible that several research methods and data collection methods will continue to co-exist because, as Harris (1998:114) notes, *'all scientific knowledge consists of bodies of theories that are in a state of refinement, abandonment, resurrection or invention'*.

This study utilises the positivist approach, also called traditional or quantative research (Leedy and Ormrod, 2001). The positivist paradigm is objectivist and is based on the belief that the world is objective and external; science is value free; and the observer is independent of the observed (Neuman, 1994; Amaratunga *et al.*, 2002; Easterby-Smith *et al.*, 2002). Accordingly, it asserts that there are universal principles that represent causal relationships, and that the scientific method can be used to unveil those relationships (Neuman, 1994; Easterby-Smith *et al.*, 2002; Fellows and Liu, 2003). Positivism is founded on the premise that regularity exists in human behaviour and it manifests as cause-effect relationships which can be tested empirically to establish associations, comparisons, prediction and generalisations (Edum-Fotwe *et al.*, 1996; Wing *et al.*, 1998; Babbie, 2004).

Logical positivism uses quantative and experimental methods to test hypothetical-deductive generalisations (Amaratunga *et al.*, 2002). This approach was chosen for this study because the data involved are inherently objective in that it enquired about factual information about the nature of training experience of the craftsmen. In addition, given that there is an existing formal craft training system in Kenya, it

was possible to generate hypo-deductive generalisations that the undocumented informal craft training system is similar in terms of skills propagated and skilling methods and that the nature of training in the later system is well understood. Data could then be collected to subsequently verify these generalisations. To establish the typical skills requirements and the skilling methods among the informal craftsmen, it was necessary to collect data from a significant sample of the target population to make generalisation feasible. The quantative research method accordingly afforded the most appropriate approach. To corroborate the quantative data, supplementary data in the form of brief interviews were also collected from trainers and employers.

Research method

The nature of the data sought dictates the research method (Leedy and Ormrod, 2001). This study seeks to investigate the skills the informally employed craftsmen in Kenya have, and the methods by which they were acquired. This information is not documented and could not be sourced from the employers' records because the casual and self-employment nature of engagement of the craftsmen had eroded the employers' responsibility to train, and consequently they did not maintain craft training records. Information on skills and skilling amongst craftsmen could therefore only be accessed by enquiring directly from the craftsmen. Consequently, it was necessary to identify a research method that allowed for the collection of data on the training experiences of these craftsmen.

Having selected a quantitative research approach, the various research designs under this approach were considered. There are two main research designs used in quantative research approach, namely, descriptive and experimental research distinguished (Fink, 2003a);

- Experimental design is where two or more groups are compared with one group being the experimental and the other(s) being the control group. The experimental and control groups are given different interventions, after which the groups are compared to show how they reacted to the different interventions. The study may be carried out before, during, or after the intervention.

- Descriptive design or observational design produces information on groups and phenomena that already exist. They can be divided into three categories. Cross-sectional design gathers data at one fixed point in time to provide a portrait of the group. Cohort design provides data about changes in a specific population over time and case controls are retrospective studies that go back in time to help explain a current phenomenon.

The experimental approach was not feasible for this study because its aim is to investigate the existing training situation as is and no interventions were planned. This research thus used the descriptive design approach to provide a snapshot of the informal training phenomenon. Specifically, the cross-sectional design category was used to collect data via the survey method.

Survey method

A survey is a system for collecting information to describe, compare, or explain knowledge, attitudes, and behaviour of people (Fink, 1995b). It is appropriate where the individuals are the units of analysis and primary data (not available elsewhere) are required to describe the population (Babbie, 2004). The population under study must, however, be accessible and willing to provide information to afford a snapshot of the relevant state of affairs to be taken (Rea and Parker, 2005). The survey method studies a phenomenon of the moment by asking people questions about the issues under study, and tabulating their answers (Leedy and Ormrod, 2001). Data used in the survey method can also be obtained indirectly by reviewing written, oral, and visual records of people's thoughts and actions or by observing people in natural or experimental settings (Fink, 2003b). This study utilised the survey method employing questionnaires to collect original data, namely; craftsmen were asked questions about the skills they practiced and how they had acquired them.

The survey method was selected for several reasons. Firstly, the craftsmen in the Kenyan construction sector are divided into diverse trades namely, carpenters, masons, plumbers, painters and electrical wiremen. The survey method is appropriate for collecting data from such a population because it allows for stratified sampling, which ensures that all the trades are represented in the study. Secondly, the survey method allows for data to be collected from several respondents so that

the training experiences of several craftsmen can be analysed. This makes it possible to identify any patterns or attributes and characteristics of the population. The survey method of face-to-face interviews was additionally preferred because it is effective for collecting data from a population that has low levels of formal education as was expected among the informally employed craftsmen. Such effectiveness is ensured because the interviewer is able to offer reading and writing assistance, and explanations or substantiations of questions to respondents with poor reading and writing skills. Finally, other scholars have successfully used the survey method to investigate issues relating to craftsmen in similar environments as those prevailing in Kenya during the study as exemplified in the examples below.

English (2000) studied opportunities for training and self-development of the informal construction worker in South Africa, collecting data from 200 construction operatives at various sites using the face-to-face interview method. English chose this method in view of the lack of a proper sampling frame and the low levels of education among the respondents. Jayawardane and Gunawardena (1998), in a study of construction workers in Sri Lanka, used the face-to-face interview survey method to collect data from site operatives successfully. The operatives under study in Sri Lanka were informally employed and had little or no formal training. Rowings *et al.* (1996) used questionnaires administered at the job site survey to investigate the characteristics of craftsmen in the USA. The survey sample was 4,600 craftsmen representing more than 30 skills. Zakeri *et al.* (1996) used a structured questionnaire survey to collect data from 355 construction operatives in Iran. Their study aimed at investigating the constraints to operative productivity. The respondents were allowed to take the questionnaires home, culminating in a 42.1% effective response rate which is relatively lower than other face-to-face interviews. Barasa and Kaabwe (2001) used the survey method to investigate vocational training in the informal sector of Kenya. In their study they surveyed a total of 102 instructors and 176 trainees using face-to-face questionnaires, checklists, and interviews. They achieved a response rate of 90%. Kappia *et al.* (2007) used the questionnaire survey method to investigate the career aspirations of construction craft trainees in UK. The questionnaires were administered to 563 trainees across all craft occupations, followed by focussed discussions aimed at elaborating the findings. The above studies were conducted among respondents

and in environments that are very similar to the Kenyan construction sector. In addition, data collected related *inter alia* to issues of training, skills levels, and skills shortages as in this study. Together these studies show that survey method for data collection amongst craftsmen in diverse construction sectors is appropriate and empirically sound and supports its use in this study.

Methods of data collection

Data collection in the survey method involves the posing of a series of questions to willing respondents and recording their responses for further analysis (Leedy and Ormrod, 2001). The questionnaires may be administered to the target population in various methods as discussed below.

The telephone interview method of data collection is where the interviewer phones the respondents and asks them questions and records their responses (Leedy and Ormrod, 2001; Bourque and Fielder, 2003a). The advantage of this method is that it allows rapid data collection, costs less, and affords more respondent anonymity than an in-person interview (Rea and Parker, 2005). The disadvantages include; the inability to use visual material; the lack of control the interviewer has over the process; and the exclusion of that part of the target population without access to a phone (*Ibid.)*. This method of data collection was not feasible in this study because there is no known register of telephone contacts for informal craftsmen. Attempts to use 'snowballing techniques' (Fink, 1995b; Rea and Parker, 2005) to make contact with informal craftsmen by phone would potentially introduce bias into the sample.

Mail-out surveys entail the dissemination of printed questionnaires through the post to respondents who complete the same and return them to the researcher via mail (Bourque and Fielder, 2003b; Rea and Parker, 2005). Its advantages include anonymity for the respondent, possible cost savings, and ample time for the respondents to fill in the questionnaire (Rea and Parker, 2005). Mail-out surveys have the disadvantage of requiring time for follow-up, higher possibility of incomplete responses, and low response rates (Leedy and Ormrod, 2001; Rea and Parker, 2005). Web-based surveys are another method closely related to the mail-out survey. Here the email addresses of the respondents are used to dispatch the questionnaires and respondents complete the same on the internet and email them

back to the researcher (Rea and Parker, 2005). Web-based surveys have similar advantages and disadvantages to the mail-out surveys but, in addition, their use is limited by the small number of persons with email addresses, which is a major disadvantage in a developing country like Kenya. As with the telephone interview method, mail-out and web-based surveys were not considered optimal for the target population in this study because of the inability to identify postal/email addresses for the respondents. Moreover, these two methods work best among a highly educated population as they require proficiency in reading and writing. The likelihood of low levels of formal education among the informal construction craftsmen suggested by the literature (Mitullah and Wachira, 2003), therefore, militated against the use of these methods.

In-person surveys, also known as face-to-face interviews, are the other method of data collection. Here the interviewer solicits data directly from the respondent in a face-to-face encounter; the interviewer will ask the respondents questions and record the responses on the questionnaire (Oishi, 2003; Babbie, 2004; Rea and Parker, 2005). This method of data collection has the advantage of allowing the interviewer to clarify ambiguous answers, a better ability to contact hard-to-reach populations, assurance that instructions are followed, and yield the highest response rates because the interviewer gains the respondents co-operation through rapport (Leedy and Ormrod, 2001; Rea and Parker, 2005). In-person surveys are suitable where telephone and address list of respondents are not available and where the respondents' ability to complete a written questionnaire without assistance is suspect, that is, where the reading and writing skills of the respondents are likely to affect their responses to the questionnaire and their interpretation of the questions (Salant and Dillman, 1994; Leedy and Ormrod, 2001). The disadvantage of this method is that it is more costly than the other methods in terms of time per interview and travel; it is subject to interviewer-induced bias; and it affords less anonymity to the respondent (Salant and Dillman, 1994; Rea and Parker, 2005).

In consideration of the characteristics of the informal construction craftsmen; unknown telephone, postal or email contacts; possibility of low-levels of education which could potentially affect interpretation of questions and responses; plus the need to take advantage of the method promising the highest possible response rate;

in-person survey afforded the most appropriate method of data collection for this study as in the case of Sri Lanka (Jayawardane and Gunawardena, 1998). Moreover, most of the respondents were accessed on construction sites where they work under rough conditions and are constantly mobile, sometimes changing sites on a daily basis. It was therefore not prudent to drop off the questionnaires for the craftsmen to complete at their own time and then have the researcher collect the completed questionnaires at a later date. To mitigate the higher expense associated with in-person survey, the survey instrument was pilot tested to minimise the time of each interview, and plans were made to allow for respondents in the same locality to be interviewed on the same days to reduce travelling costs. In addition to collecting data from the craftsmen, brief interviews were conducted with trainers and employers. The purpose of the interviews was to supplement the data collected from the craftsmen.

4.2 SOURCES OF DATA

Population

Generally, a population is composed of the entire set of objects, events or people that can be studied (Rea and Parker, 2005). In research, however, the interest is in the working or study population. The working population is that part of the general populations that possesses the characteristics that the research aims to study, that is, fulfils the requirement of the research (*Ibid.*). In this study the working population is composed of all craftsmen working under informal employment terms in the construction sector in Kenya.

This research focused on craftsmen working in Nairobi, the capital city of Kenya, and the trend-setter in all economic sectors in the country including construction. Nairobi was selected because it has the highest percentage of informal sector operatives in the Kenya, averaging 24% over the last five years (ROK, 1980 - 2007) and, consequently, the majority of informal construction workmen. Moreover, Nairobi represents the majority of the construction sector in Kenya, both formal and informal. This is exemplified by data that indicates that between 1999 and 2006, Nairobi accounted for an average of 55% of the value of all approved building plans in Kenya (ROK, 1980 - 2007). Accordingly, surveying informally employed

craftsmen in Nairobi is anticipated to be generalisable across Kenya. Additionally, much of the housing in rural Kenya utilises vernacular construction methods, for example, Maasai women construct huts with wattle and mud mixed with cow dung, and do not utilise the craft skills that are under consideration in this study; hence a modern urban locality afforded a more appropriate study field. Nairobi province covers 684 square kilometres divided into eight administrative divisions. Although, the study sample included craftsmen working on construction sites in all the divisions, it was apparent that the limited area of the province, coupled with ease of entry into the informal construction market, afforded no geographical restrictions to finding work. The study population was therefore, refined to comprise of informal construction craftsmen operating in Nairobi.

From the study population it was necessary to compile a sampling frame. A sampling frame is the list of all units making up the study population (Salant and Dillman, 1994). For this study, the sampling frame would be a list of all informal construction craftsmen working in Nairobi. This, however, posed several challenges. The informal construction sector comprises unregulated and unprotected individuals (CIB Task Group 29, 1998:xii). This lack of regulation, coupled with the ease of entry and exit typical of the informal sector, meant that no register of these operators exists, and hence the lack of a proper sampling frame as in other informal sector studies (Barasa and Kaabwe, 2001). The lack of a proper sampling frame is not unique to Kenya but is a common feature in many developing countries as reported in the study of construction workers in Sri Lanka (Jayawardane and Gunawardena, 1998). An estimate of the size of the working population had therefore to be formulated from other sources.

According to published data (ROK, 1980 - 2007), there were 6,814,900 persons working in the informal sector in Kenya in the year 2006. Consistently over the past five years, an average of 3% of all informal workers in Kenya, were engaged in the construction sector, and 24% were working in Nairobi. Assuming that the apportionment of informal workers by sectors is roughly consistent in all geographical localities of Kenya, it can be estimated that the number of informal construction workmen in Nairobi in the year 2006 was 11,513. Given that the number of informal construction workmen in Nairobi has remained generally stable

over the last five years (average growth of less that 500 persons per year) (*Ibid.*), and the 2006 figure may include craftsmen as well as unskilled labourers, it was decided that the working population for this study be estimated at the 2006 figure of 11,513 for the year 2008.

In addition to the craftsmen, the other populations involved in this study include trainers in the vocational colleges that offer construction craft skills, and employers of craftsmen. These groups were supplementary sources of data for the study, aimed mainly at corroborating the data collected from the craftsmen, and it was decided that five in each group would be interviewed.

Sampling

Sampling is a method of selecting a subset of the working population to collect data from. Inferences made from such data are then deemed to be attributable to the whole working population. The sample is thus selected such that it possesses characteristics similar to those of the working population, that is, the sample must mirror the target population (Leedy and Ormrod, 2001; Fink, 2003b). Generally, the larger the sample the more confidence that the inferences made reflect those of the working population (Rea and Parker, 2005). Sampling is done because it is usually not necessary or feasible, given the constraints of time and cost, to collect data from the whole population. Additionally, the sampling procedure is determined by the purpose of the sampling and the parameters of the working population (Leedy and Ormrod, 2001).

Sampling of craftsmen

Given that the working population of craftsmen in this study was an estimate it was not possible to calculate the sample size directly. Bearing in mind that the sample size should be adequate to allow reliability and replicability of the results (Walker, 1997), this group's sample size was determined using guidelines given by other researchers and statisticians.

Gay (1996:125), as quoted by Leedy and Ormrod (2001:221), provides the following guideline to determine sample sizes;

- For small populations (N<100), survey the whole population

- If the population size is around 500, 50% of the population should be sampled
- If the population size is around 1,500, 20% should be sampled
- For a population equal to or exceeding 5,000, the population size is almost irrelevant and a sample size of 400 will be adequate.

Rea and Parker (2005:150) assert that a population size of fewer than 100,000 is considered small and guideline for sample selections for the relevant range of population is;

- A sample size of 370 from a population of 10,000 will yield a sampling error of +/- 5% at the 95% confidence level
- A sample size of 377 from a population of 20,000 will yield a sampling error of +/- 5% at the 95% confidence level.

Salant and Dillman (1994:55) give the following guidelines for similar ranges of population;

- For a population of 10,000, given the expectation that the variation in the population with respect to the characteristics of interest of 50/50, a sample of 370 will yield a sampling error of +/- 5% at the 95% confidence level.
- For a population of 10,000, given the expectation that the variation in the population with respect to the characteristics of interest of 80/20, a sample of 240 will yield a sampling error of +/- 5% at the 95% confidence level.
- For a population of 25,000, given the expectation that the variation in the population with respect to the characteristics of interest of 50/50, a sample of 378 will yield a sampling error of +/- 5% at the 95% confidence level.
- For a population of 25,000, given the expectation that the variation in the population with respect to the characteristics of interest of 80/20, a sample of 234 will yield a sampling error of +/- 5% at the 95% confidence level.

The sample sizes indicated in these guidelines refer to the numbers of usable duly completed questionnaires or interviews. Researchers, however, warn against expecting 100% response rate and advise that the sample sizes be adjusted in view of a realistically achievable response rate (Salant and Dillman, 1994).

The guidelines above indicate that a sample size of 370 craftsmen would be adequate for this study. In consideration of the use of the face-to-face interview method of data collection, which is reputed to have high response rates, it was estimated that a 95% response rate was reasonably achievable. This then translated to a sample size of 389 craftsmen, which was then rounded to 400. The sample size of 400 craftsmen was consequently used for this study.

Composition of the sample

The next step was to decide on the composition of the sample. The informal construction craftsmen under study practice different trades. These diverse trades were anticipated to follow the formal categorisation and accreditation, which consists of five distinct trades, namely, carpentry and joinery, masonry, electrical wireman, plumber pipe fitter and painter decorator. To allow for a snapshot of the skills and modes of skilling among the craftsmen, the sample needed to be selected such that all the different trades are represented. This would allow the data obtained to be analysed by trade in order to highlight any significant similarities or differences between the respective trades. Consequently, it was decided that the study's data collection would follow the formal categorisation but allow for investigation into any emerging trades or specialisms, hence the use of stratified sampling. Stratified sampling involves the separation of the sample into mutually exclusive groups to make sure that each stratum is represented in the sample (Rea and Parker, 2005).

It is recommended that an eligibility criteria be set for the sample (Fink, 1995b). The criteria specify the characteristics of respondents who are eligible to participate in the survey, hence focussing it only on those people who can provide the most accurate information. The eligibility criteria for this study foremost involved identification of the craftsmen working under informal employment. As explained in Section 2.1, informal employment in Kenya comprises those craftsmen who are employed by formal enterprises (contractors) on casual terms, and those employed directly by clients under the informal procurement system. Accordingly, craftsmen eligible to participate in this study were limited to those working in either of these forms of engagement.

In addition, it was decided that for an informally employed craftsman to be eligible to participate in the survey, he should have worked as a skilled operative in the construction sector for at least two years. The time limitation was set to ensure that data would only be collected from operatives committed to working in the construction sector, and not seasonal workmen or those working temporarily as they waited for employment opportunities in other sectors. In the absence of formal accreditation of many of the informal sector craftsmen, the recognition of a skilled craftsman was difficult to establish. It was therefore decided that the most plausible manner would be to accept the vetting of the employer or the person in charge of the site, that is, if a worker was employed as a craftsman on the site then the study would accept him as such. This assumption is based on the premise that, in the interest of quality craftsmanship and value for money, employers or their representatives only engage craftsmen with proven ability. The measure of skill was additionally vetted by the requirement that the craftsmen should have worked as a skilled operative for at least two years. These criteria were set to ensure that the respondents interviewed would be *bona fide* representatives of the craftsmen operating in the construction sector.

Sampling of trainers and employers

The respondents from the other groups involved in this study were sampled via purposive sampling. Purposive sampling is a non-probability sampling method that allows researchers to use their own judgement to select the respondents, that is, the respondents are chosen because they have the information needed (Leedy and Ormrod, 2001; Rea and Parker, 2005). This method was selected because the training institutions deal with many other issues, which are not relevant to the study. It was thus necessary to target the data collection to specific respondents who were knowledgeable about the research questions. Accordingly, the heads and tutors of the construction training departments were targeted. Employers were identified from those running active sites within Nairobi and who were additionally accessible and willing to be interviewed.

4.3 QUESTIONNAIRE DESIGN

As this survey research used face-to-face interviews to collect data from the craftsmen, comprehensive questionnaires were developed to obtain data on what

skills the craftsmen were acquiring, the methods of skilling and modes of propagating the skills. The questionnaire, depicted in Appendix A, was designed to collected data based on the main issues surrounding the types of craft skills in the construction sector and the associated skilling methods as identified in the literature review. In addition, the questionnaire was tailored to gather the data required to address the study's research questions. Further, each question was probed for its usefulness in achieving the study objectives; for appropriateness of its format; and in consideration of the method of capturing and analysing the data collected (Fink, 1995a; Walker, 1997; Nardi, 2006).

A standard questionnaire was administered to individual craftsmen across all construction trades under study. The questionnaire comprised of structured questions but allowed the respondents to give any relevant additional information under the category of 'other' added to each question. This allowed the respondent to insert their own choices if those provided were inappropriate. Structured questionnaires were chosen because they are an efficient method of collecting systematic primary data from respondents (Rea and Parker, 2005; Nardi, 2006).

The questionnaire had a total of 36 questions divided into four sections. The first section solicited general information from the craftsman, for instance, number of years worked in construction, age, and education. These questions were intended to collect biographical data that would provide a contextual background for the rest of the survey. Being direct and relatively easy to answer, these general questions were also intended to put the respondent at ease, hence their positioning at the beginning of the questionnaire (Salant and Dillman, 1994; Bourque and Fielder, 2003b). The next section enquired about the craftsman's skills and method of skilling, for example, their trade, how they trained, and possession of generic skills. This section dealt with the main issues under investigation in the study. Subsequently was a section investigating the reproduction of craft skills amongst fresh sector entrants. The craftsmen were asked about the source of their trainees, the criteria for selection, and training financing. The purpose of this section was to explore the current training environment to ascertain if it differed from the craftsmen's training experience in order to enable the identification of typical skilling routes. Finally, the questionnaire dealt with issues relating to delivery of training, for

instance, appropriate language, time and venues, and the role of employee organisations. This information was intended to indicate the craftsmen training preferences as a proxy to the obstacles in the existing training programs. In addition, the training preferences would indicate the interventions that stakeholders (employers, state and trainers) might institute to enhance craft training in the sector. Table 4.1 summarises the information solicited from the craftsmen under the various research questions.

Table 4. 1: Data collected from the craftsmen

Research questions	Craftsmen
What skills do clients in the informal construction sector require from craftsmen?	○ Main trade skill ○ Unrecognised and emerging trades ○ Multiskills - common mixes ○ Generic skills ➢ Methods of work ➢ Interpretation of drawing/documents ➢ Estimation ➢ Supervision ➢ Materials specifications ➢ Job management, Entrepreneurial ○ Skill certification
How are the craftsmen acquiring these skills in view of the decline in formal training?	○ Formal training ➢ Colleges, Formal apprenticeship ○ Informal training ➢ Informal apprenticeship ➢ Observation and experience ➢ Village polytechnics ○ Period of training – norms ○ Training others ➢ Selection criteria ➢ Financing
Do the skills acquired in the informal sector conform to the skill requirements of the formal construction sector?	○ Problems being recruited on formal jobs ○ Skills that cannot be informally acquired ○ Utilisation of ➢ Multiskills ➢ Generic skills
What training delivery methods are appropriate given the sector's shift towards casualisation of labour and an increasingly informal construction system?	○ Role of employee organisation ○ Suitable timing – evenings, weekends, scheduled days ○ Suitable location ○ Language of instruction
Other data	○ Age, Education level ○ Period worked in construction ○ Formal and informal clients ○ Mode of engagement

The majority of questions in the survey instrument utilised categorical or nominal measurements in order to bring out the diverse experiences of the craftsmen. Completion of the questionnaire entailed the interviewer circling the appropriate option(s) selected by the respondent in each question. This method proved to be the most efficient, economising on the time required to interview each respondent. Consequently, each questionnaire was completed within an average of 10 to 15 minutes.

In addition to the data collected from the informal craftsmen, interviews were conducted with trainers at training institutions and employers. These interviews were intended to supplement and corroborate the information from the craftsmen. Table 4.2 indicates the data sought in the interviews with these stakeholders via guiding questions.

Table 4. 2: Data collected from trainers and employers

Research questions	TRAINERS	EMPLOYERS
What skills do clients in the informal construction sector require from craftsmen?	○ Skills taught ○ Adequacy of DIT syllabus	○ Skills expected ○ View of multiskills
How are the craftsmen acquiring these skills in view of the decline in formal training?	○ Numbers trained ○ Capacity utilisation ○ Training in multiskills	○ Value of accreditation ○ Measure of proficiency
Do the skills acquired in the informal sector conform to the skill requirements of the formal construction sector?	○ Opinion on trade testing ○ Opinion of informally trained craftsmen	○ Satisfaction with informally acquired skills
What training delivery methods are appropriate given the sector's shift towards casualisation of labour and an increasingly informal construction system?	○ Flexibility in training delivery ○ Mobile training units ○ Language ○ Teach new skills ○ Training incentives	○ Allow training on their sites ○ Pay training levy ○ Demand proof of proficiency
Other data	○ Problem associated with training ○ New skills needs	○ Satisfaction with the proficiency of the craftsmen

4.4 DATA COLLECTION

The data collection process commenced with an application for research authorisation to the Ministry of Science and Technology, Kenya. The application

entailed the completion of an application form detailing the research purpose, funding, relevant population, intended geographical location; submission of the research proposal; and paying the prescribed fee (for this study Kenya Shillings 1,000 (US$16.13)). The information submitted was then scrutinised for associated ethical or other considerations that may adversely affect the targeted population or the public. The application for research authorisation for this study was approved and a research clearance permit issued in November 2007 (see Appendix C).

The craftsman is the unit of analysis in this research and the focus of the data collection. This differs markedly from other studies on the skills and training of construction craftsmen where the enterprise and the employer form the basis of analysis, for example, Agapiou and Dauber (2001) where 100 enterprises were interviewed in a bid to investigate training and skill requirements in the Scottish construction sector; and Dainty *et. al.* (2005) which investigated the impact of the skills crisis in the UK on small-medium-sized employers.

In this study, interviewing employers was not viable because of a number of reasons. Firstly, the informally employed craftsmen have no direct employment with any employer or enterprise because of the thriving casualisation and self-employment. These *ad hoc* terms of engagement have eroded the employers motivation to train hence they do not keep training records as the craftsmen increasingly taking charge of their own training. Secondly, informal employers, who are the most dominant in the sector, are difficult to identify and contact to organise interviews because they are not registered, and typically they do not keep employee records. Therefore, given that the craftsmen are rational economic workers, the skills they possess were deemed to be a reflection of the market requirement.

The face-to-face interviews were conducted at the convenience of the craftsmen, mainly at the construction sites. The study targeted construction sites where work was ongoing for ease of meeting craftsmen during their working day and because the lack of readily available craftsmen's contact details precluded identification of other meeting places. On arrival at the site, effort was made to identify who was in-charge of the site (employer, lead craftsman, contractor, foreman or their representatives) and to seek their permission as gatekeepers to identify any

workmen hired as craftsmen and to obtain permission to interview them on site. Access to the workmen was thus negotiated with whoever was in-charge at the time of the visit. In an effort to cause the least disruption, interviews were scheduled in the craftsmen's free time/breaks; for example during the lunch break or at the end of the work day.

Data collection ethics require respect for the respondents by ensuring voluntary participation via informed consent and guarantee of confidentiality (Salant and Dillman, 1994; Babbie, 2004; Rea and Parker, 2005). Accordingly, before each interview, informed consent was sought from the craftsmen via dialogue (as opposed to signing consent sheet) by explaining the purpose of the study and giving each a chance to voluntarily participate in the survey. In addition, the craftsmen were assured of the confidentiality of the information gathered, in that results would be presented such that individual respondents could not be identified and the data would be used for research purposes only. The interviews were conducted in English or Kiswahili depending on the language that the craftsmen were most comfortable with. The translation into Kiswahili was done by the interviewer using wording familiar to the craftsmen as determined via information obtained during the pilot testing. Data in the main field study were collected with the aid of a pre-trained research assistant. To minimise the risk of interviewer bias, and to ensure that a shared perspective was maintained throughout the data collection process, the research assistant always accompanied the researcher in all the field trips to the sites.

Data from the training institutions and employers were collected via interviews. These were conducted at the respondent's convenience by prior appointment. As with the craftsmen, before the commencement of the interview the respondents were given an explanation of the purpose of the interview and how they had been identified. The respondents were each given a chance to voluntarily participate in the interview and they were assured of the confidentiality of the information gathered. Consent to use a voice recorder was also sought from the respondents and the same was used in the interviews where there was no objection. The responses were therefore recorded by the interviewer in writing and/or with a voice recorder. The language used with these respondents was mainly English.

Pilot testing

Pilot testing is the pre-testing of the survey instrument under actual survey conditions, by administering the questionnaire to a small group of the working population (Rea and Parker, 2005). It is akin to a trial run for the survey instrument, intended to refine the quality of the instrument to ensure more efficiency in the actual field survey. Additionally, pilot testing helps to identify errors and predict possible problems in the survey instrument, thereby allowing correction before the actually field study (Litwin, 2003). Moreover, it assists in the determination of the time and cost requirement for data collection; makes the research boundaries clearer; and the research more focused (Walker, 1997). Many writers, (e.g. Salant and Dillman, 1994; Leedy and Ormrod, 2001; Litwin, 2003; Rea and Parker, 2005), strongly recommend pilot testing of survey instruments before embarking on the field survey. It is recommended that pre-testing should involve 20 to 40 respondents (Rea and Parker, 2005).

In this instance, the questionnaire used to collect data from the informal craftsmen was piloted on a sample of 43 craftsmen. The pilot sample composed of 12 masons, 8 carpenter/joiners, 5 electrical wiremen, 4 plumbers, 4 painters, 5 steel fixers and 5 plasterers. These craftsmen were engaged on diverse projects including residential houses, blocks of flats, commercial buildings, and schools, all at different levels of construction. The building height ranged from single storey to five storeys all with diverse plinth areas and shapes. The buildings were mainly constructed of reinforced concrete frame infilled with stones blocks, roofed with clay tiles, and finished with plaster and paint. The pilot testing was carried out at Nairobi, in April 2007, over a period of three weeks.

During the pilot study some weakness were identified in the questionnaire leading to the elimination of some of the questions and the modification of others. For example, a question asking the craftsmen to indicate the amount of working time that they spent executing non-trade skills was eliminated. During the interviews, it became clear that the craftsmen executed many of the generic tasks, e.g. costing, outside the working time (mostly in the evening) typically over several days depending on the ease with which the information sought could be accessed. It was

thus difficult to allocate specific working times to these tasks. The pilot study also established the extent to which questions in the survey instrument were easily understood by the craftsmen, by establishing appropriate wording for translation into the Kiswahili language which is common among the respondents. Moreover, the pilot study data allowed for the refinement and selection of the appropriate data analysis procedures via a data trial run. Having confirmed that data could be successfully collected, the main field survey was launched.

Main field study

The main field study consisted of the data collection from the informally employed craftsmen at various construction sites in Nairobi. The field study was undertaken over a period of four months, between November 2007 and February 2008. As with the pilot study, the projects under construction comprised schools, houses, commercial, and mixed development facilities. The projects ranged from bungalows to ten storey commercial developments, constructed using similar materials and construction techniques to the pilot study sample. The clients involved in the projects were from both the public and private sectors. The public sector projects were managed by general contractors who employed craftsmen, while those in the private sector engaged craftsmen directly under the informal procurement system.

As the craftsman was the focus of this study and the unit of analysis, the number of construction sites visited during the study was determined by the number and variety of trades employed on the respective sites at the time of data collection. This was, in turn, dictated by the size of the facility under construction as larger multi-storey facilities tended to engage higher numbers of craftsmen; and the work at hand, e.g., if the construction was at walling stage, there were more masons at work. Trade crafts like plumbing and electrical wiremen were only available on projects where the structural frame was in place, and plasterers and painters where facilities were nearing completion. In the multi-storeyed buildings, it was common to find a wider variety of trades because work typically was progressing at different stages on each floor. Appendix F portrays a sample of photos of the craftsmen and their trainees at various sites.

The craftsmen willingly volunteered the information required resulting in a response rate that exceeded the target (see Table 4.3). The receptiveness of the craftsmen was probably motivated by the fact that, as some of them explained, the study was a novel experience for most of them as they rarely encountered people that were interested in their opinions on issues that affect their careers. Conversely, setting appointments with the respondents from the training institutions was far more problematic because the data collection period coincided with the election season in Kenya when many of their employees were on leave. The employers interviewed were those that were available at the construction sites visited.

Survey response

Table 4.3 indicates the survey responses from the various categories of respondents. In all the categories of respondents, the targets were achieved or exceeded. The survey of informally employed craftsmen exceeded the targets. This was due to the availability of a higher number of craftsmen willing to be interviewed in the sites visited. It was deemed imprudent to ignore the additional respondents as this could improve the confidence of the sample being more representative of the population. Moreover, extra responses in the survey method are deemed beneficial because they improve the accuracy of the results thereby enhancing their ability to be generalised (Rea and Parker, 2005).

Table 4. 3: Survey response

Respondents	Targeted number	Actual responses	
		Number	Percentage
Craftsmen	400	498	125
Training institutions	5	5	100
Employers	5	5	100

4.5 DATA CAPTURE AND ANALYSIS

The data collection process generated considerable data and many variables as indicated in the questionnaire in Appendix A. The data were analysed using the SPSS for windows software. This software was selected because it is well

established and suitable for analysing the type of data that were collected in this study (Buckingham and Sauders, 2004; Field, 2005).

Data capture

In addition to the data from the questions, two additional variables were introduced. The first was the unique numerical identification for each completed questionnaire, and the second represented the craftsman's locality in Nairobi as indicated on the first page of the questionnaire. The purpose of these two variables was to ease the process of data capture and verification, particularly in cases where errors identified at a later stage demanded the data to be crosschecked against specific questionnaires. To capture the data in SPSS, the numerical codes allocated to each of the possible answer options within particular questions, plus their labels, were defined in the fields (Babbie and Halley, 1995; Field, 2005). Additional fields were utilised to capture any relevant data volunteered by the respondents. Consideration was given to some questions that were not applicable to all respondents, for example, questions about trainees did not apply to craftsmen who had never trained others. To eliminate the potential of distortion of the interpretation of such questions, all non-applicable responses were labelled as missing values in SPSS, and were consequently excluded from the relevant calculations and recorded separately in the results (*Ibid.)*.

Questions that required the respondent to select all the applicable choices necessitated refinement for ease of data entry into SPSS. Such refinement required the grouping or aggregating of related choices, e.g., in Q-14 all the tasks that related to the use of cement (e.g. masonry, plastering, and flooring) were grouped together under the category cement works. Some of the questions were multiple-response where the respondents were allowed to select all the applicable responses (more than one value). Data from these questions were captured using the multiple-dichotomy method; for each possible response a variable that can have one of two values was created, such as, 1 for yes and 2 for no (Field, 2005). For instance, in Q-16 each alternative answer was treated as a variable with the option 'yes' for those who practised the specific skill and 'no' for those who did not. At the end of the data capture process, verification was conducted via manual random check on both the soft and the hard copy outputs.

Data analysis

Statistical analysis was executed with the assistance of the SPSS software. The data collected were mainly of a nominal or categorical nature and were manipulated using various descriptive statistics. The results of each of the questions are presented in Appendix B. Additionally, non-parametric statistical analysis suitable to categorical data was used to draw statistical inferences (Siegel and Castellan Jr., 1988; Babbie and Halley, 1995; Field, 2005). These include the Cramer's V and Phi which measure the strength of association between two categorical variables; and the Lambda statistic (Goodman & Krustal tau) which measures the proportional error when membership of one category is used to predict category membership on another variable (*Ibid.)*. To ensure that all significant outcomes were identified, the tests of association were conducted on the results of all questions as indicated in Appendix D. The Cramer's V statistic was used to test the associations because it is more appropriate for variables that contain more than two unordered categories as was the case with most of the data in this study (*Ibid.)*. Cramer's V statistic attains values between 0 representing no association between the variables and 1 indicating dependent variables (Buckingham and Sauders, 2004; Field, 2005). For this study significant associations were deemed to be those with values higher than 0.5 (at $p<0.001$) representing a medium to high association between the variables. These are highlighted in Appendix D and are subsequently discussed in the data analysis chapter.

Given that the data in this study was collected from the craftsmen of diverse trades, each trade might potentially represent an independent population. It was thus necessary to determine whether the trades collectively could be considered to belong to the same population. Where data consists of frequencies in discrete unordered categories as in this study, the chi-square test is used to assess the significance of the differences among the independent groups (Siegel and Castellan Jr., 1988; Buckingham and Sauders, 2004; Field, 2005). Accordingly, the chi-square test was used to test the differences of the results of each question against the various trade groups. To ensure that the requirements of the chi-square test were not violated various categories were combined *(Ibid.)* and significance was set at $p<0.001$. The results of the test are presented in Appendix E where the

significant results are highlighted. The results indicate that the groups belong to the same population as significant differences are only visible in 24% of the results. Therefore, in the data analysis chapter, the results are aggregated for all questions that did not indicate significant differences and discussed along trade groupings only for questions that had significant differences.

The resulting statistical output is displayed via tables, histograms and pie charts. Although the categorical data did not allow for the statistical testing of the hypotheses, the output permitted implications of the data to the study hypotheses to be drawn. The data collected from training institutions and employers were coded along the themes identified in Table 4.2 and reported descriptively to corroborate the findings from the craftsmen.

SUMMARY

In conclusion, this study utilises the positivist approach to research to allow a portrait of the skilling experiences amongst informally employed craftsmen to be formulated. This portrait entails the mapping of the skills acquired and the skilling methods. In view of the lack of a proper sampling frame, and the possibility of low levels of education among the majority of respondents, the survey method using face-to-face interviews was selected as the most appropriate method of data collection. Figure 4.1 outlines the research process.

A standardised structured questionnaire was formulated and targeted for administration on a sample of 400 informally employed craftsmen from diverse trades. The working population was delimited to include informally employed craftsmen working in the Nairobi province of Kenya.

The response to the survey exceeded the targeted sample size as 498 informal craftsmen were interviewed. The raw data from the questionnaires were then coded, captured and analysed with the help of the SPSS software. To corroborate the data collected from the craftsmen, five training institutions and five employers were interviewed. The results of the data analysis are reported in Chapter five.

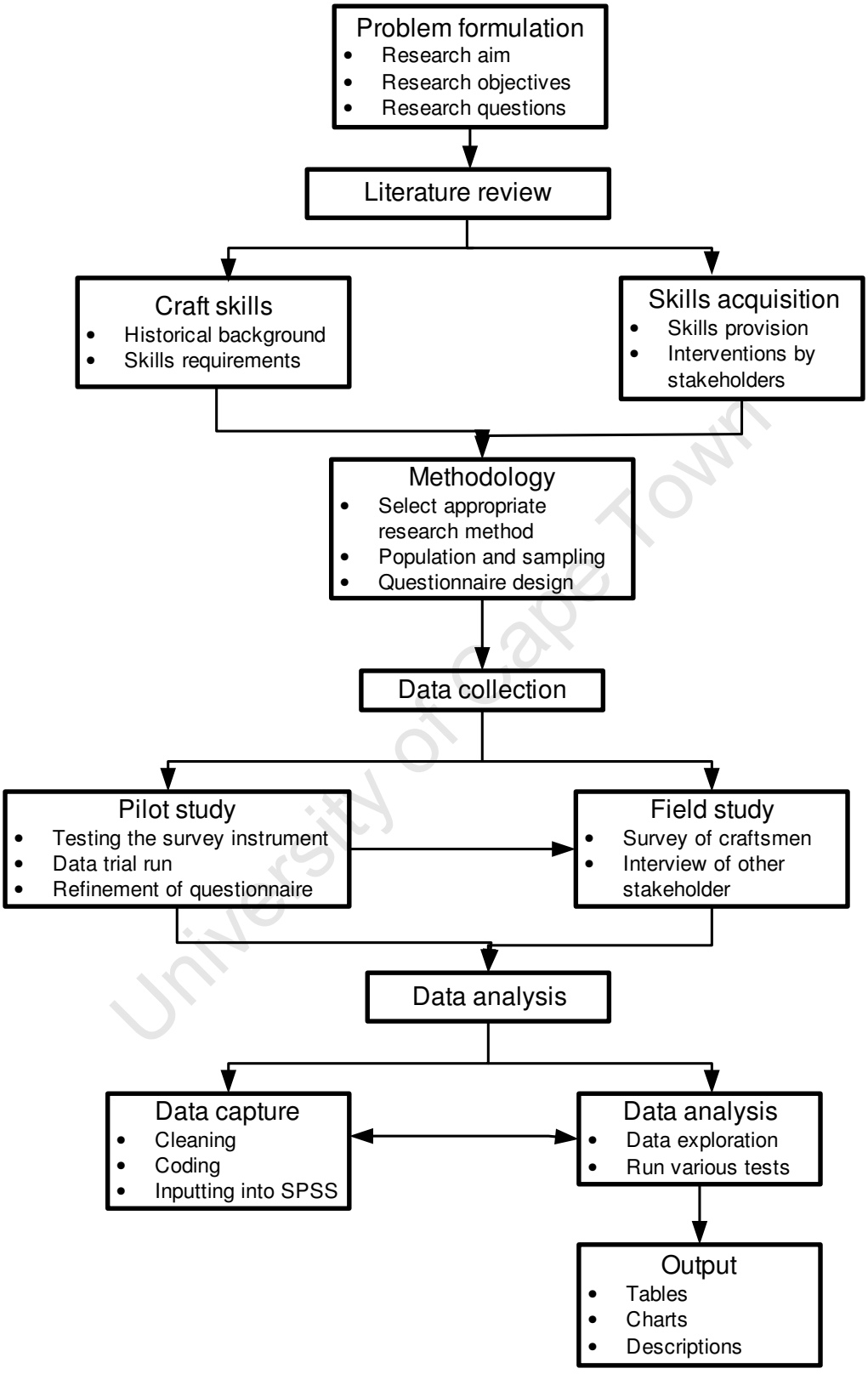


Figure 4. 1: The research process

CHAPTER FIVE - DATA PRESENTATION AND ANALYSIS

INTRODUCTION

This study aims at mapping the skills of informally employed craftsmen and investigating the skilling methods and modes of enhancing training delivery. The data collected were thus aimed at investigating the training experiences of the informally employed craftsmen as a reflection of the market demand for craft skills and existing modes of skilling. In addition, issues relating to the reproduction of the crafts skills and training delivery interventions were explored. To verify the craftsmen's views, interviews were conducted with the training institutions and employers.

Accordingly, this chapter reports on the findings and is divided into seven sections;

- Section *One* report's on the general information mainly from factual questions intended to set the context for subsequent sections.
- Section *Two* details the types of skills and the methods of skilling among the craftsmen.
- Section *Three* explores the modes used by the craftsmen to reproduce their skills among trainees.
- Section *Four* considers the training delivery interventions that may be used to enhance training among the informal craftsmen.
- Section *Five* outlines craftsmen's training provision by the training institution.
- Section *Six* presents the views of employers on the craft skill requirements and certification.
- Section *Seven* synthesises the findings by identifying the typical skill profiles and skilling routes.

Finally, a brief summary of the chapter is documented.

5.1 GENERAL INFORMATION

The purpose of questions in this section was to collect general information and biographical data from the craftsmen e.g. their age and education levels. This

information was intended set the context for the questions in the subsequent sections.

Experience

The question dealing with the duration of experience in construction was foremost intended to test the suitability of each respondent by ensuring that those interviewed had worked in the construction sector for at least two years in accordance with the set eligibility criteria in Section 4.2. The data indicate that most informally employed craftsmen are committed to careers in the construction sector with the majority possessing between 10 and 15 years experience (Table 5.1).

Table 5. 1: Duration craftsmen have been working in construction

Duration working in construction	Frequency	Percent
2 to 5 years	51	10.2
More than 5 to 10 years	130	26.1
More than 10 to 15 years	173	34.7
More than 15 to 20 years	82	16.5
More than 20 to 25 years	23	4.6
More than 25 years	39	7.8
Total	**498**	**100**

The distribution is comparable to the USA and Iran where the majority work experience was 11-20 and 10-20 years, respectively (Rowings *et al.*, 1996; Zakeri *et al.*, 1996). This relatively long experience may be deemed to be a proxy indicator that Kenyan informal craftsmen gain sufficient, satisfactory skills that enable them to pursue long-term careers in the sector. In addition, it suggests that the respondents are familiar with the training processes in the sector hence their responses may be deemed to be authentic reflections.

Age

The majority of the craftsmen were below the age of 50 years, with the modal age group being 30-39 years (Figure 5.1). The age distribution is positively skewed

(skewness =1.046 and kurtosis =1.786), indicating higher lower age scores. The relatively younger age may be a reflection of the labouring (manual) nature of construction work in Kenya where low levels of mechanisation demand physical fitness hence the sharp decline of craftsmen beyond 50 years which may be considered as the retirement age as is the case in Sri Lanka (Jayawardane and Gunawardena, 1998).

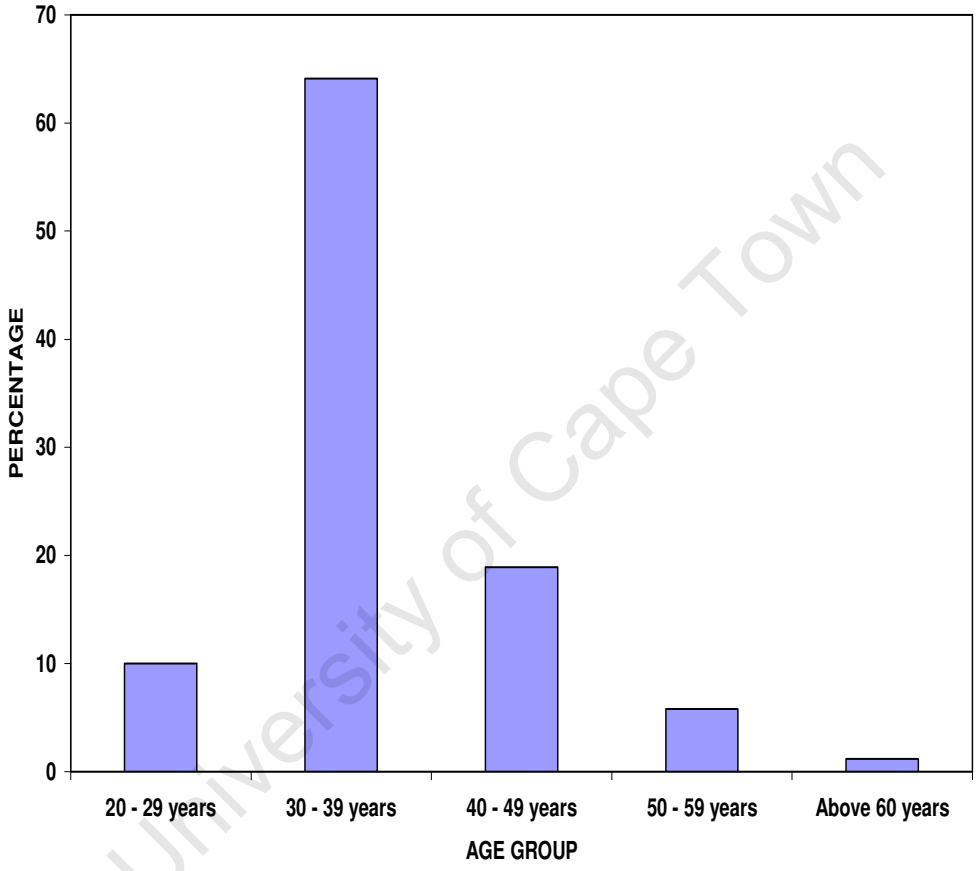


Figure 5. 1: Age of the respondent

The age distribution of the Kenyan informal craftsmen follow similar trends to Sri-Lanka, Iran and the USA (Rowings *et al.*, 1996; Zakeri *et al.*, 1996; Jayawardane and Gunawardena, 1998) as compared in Figure 5.2. This suggests that construction craftsmanship is mainly characterised by a workforce of between 20 and 40 years of age. This appears to be the norm irrespective of the diverse attributes of each sector. As expected, there is a medium association between the respondents' age and experience as indicated by Cramer's V statistic of 0.542 (at $p<0.001$).

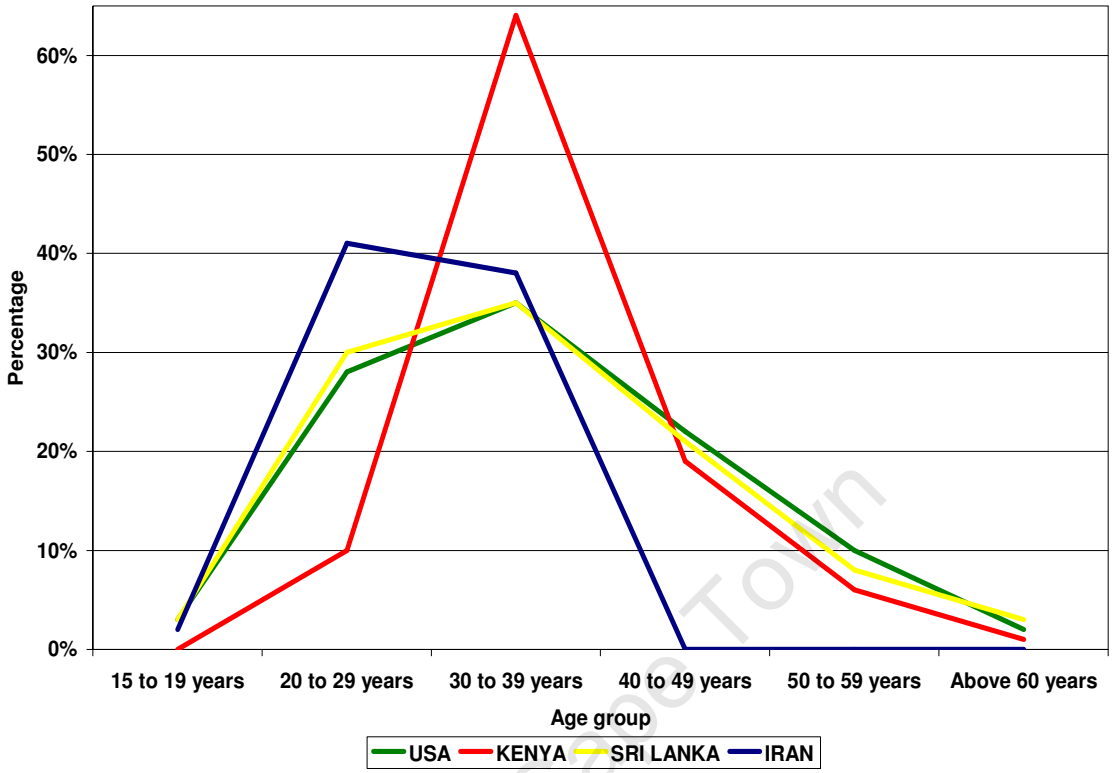


Figure 5. 2: Comparison of the craftsmen age groups Kenya, Sri Lanka and USA

Recruitment

Table 5.2 indicates that the majority of the informal craftsmen (59%) commenced work in construction as unskilled labourers. This indicates the continued prevalence of the Indian style of craftsmen recruitment where potential craftsmen are selected from the pool of labourers (King, 1977). Typically, these unskilled labourers are not required to possess any specific educational qualifications or skills to be hired because they carry out basic menial tasks under supervision. This makes construction work popular among those who have failed in formal education or those with little access to other jobs or formal training openings (King, 1987; Kent and Mushi, 1995; Loosemore *et al.*, 2003). The sourcing of trainee craftsmen from the unskilled labourers has also been observed in other construction sectors e.g. the USA where 10 – 20% of the journeymen (with the exception of electricians) started off in unskilled ranks (Foster, 1970). The other 41% joined construction after training in the various institutions including NYS, youth polytechnics, and prison. This is an indication that training institutions contribute significantly to skills development amongst informally employed craftsmen.

Table 5. 2: Recruitment of respondents into the construction sector

Recruitment into construction	Frequency	Percent
As unskilled labourer	295	59.24
After training	198	39.76
After prison training	5	1.00
Total	**498**	**100**

Further analysis of the data indicates that craftsmen from the electrical wireman and plumber pipe fitter trades have a significantly higher percentage (more than 70%), of entrants joining construction after training when compared to all the other trades which average only 23% (Table 5.3).

Table 5. 3: Relationship between respondents' trade and entry into construction

Respondents trade * did you join sector before or after training? Cross tabulation				
Respondents trade		Did you join sector before or after training?		
		Before training	After training	Total
Mason	Count	90	36	126
	% within respondents trade	71.4%	28.6%	100%
Carpenter & joiner	Count	37	49	86
	% within respondents trade	43.0%	57.0%	100%
Electrical wireman	Count	17	51	68
	% within respondents trade	25.0%	75.0%	100%
Plumber pipe fitter	Count	21	50	71
	% within respondents trade	29.6%	70.4%	100%
Painter decorator	Count	65	8	73
	% within respondents trade	89.0%	11.0%	100%
Steel fixer	Count	23	2	25
	% within respondents trade	92.0%	8.0%	100%
Plasterer	Count	10	3	13
	% within respondents trade	76.9%	23.1%	100%
Welder fabricator	Count	28	4	32
	% within respondents trade	87.5%	12.5%	100%
Landscaper	Count	3	1	4
	% within respondents trade	75.0%	25.0%	100%
Total	Count	294	204	**498**
	% within respondents trade	59%	41%	**100%**

Note: Highlight indicates trades with highest recruitment after training

The higher prevalence of college training among some trades suggests that formal training is crucial in some trades but not significant in others. This, in turn, indicates the possibility of different routes to craftsmanship amongst informally employed craftsmen, driven by the underlying technical process of each trade. This is further affirmed by the medium association between the craftsman's trade and mode of entry into construction and trade training (Cramer's V = 0.504 and 0.575, respectively, at $p<0.001$). In addition, the prevalence of college training in some trades relative to others suggests that some trades (electrical and plumbing), have relatively fewer menial tasks and require some technical background hence attracting fewer labourers when compared to other trades.

Education

Figure 5.3 indicates that 58% of the respondents did not complete their secondary school education. Consequently, these informal craftsmen are excluded from formal apprenticeships for which a minimum of a secondary school certificate is required (DIT, 2008c). Thus, these craftsmen must seek alternative modes of training that do not require stringent education requirements. This finding supports the argument that formal apprenticeship is out of step with the reality in the market (King, 1977) as it excludes more than half of the sector's craftsmen. Education levels among craftsmen in Kenya are, however, higher relative to their counterparts in Sri Lanka where 81% had no GCE O level qualification (Jayawardane and Gunawardena, 1998).

The other 42% of the informal craftsmen had completed secondary education and hence were eligible for formal vocational training. Discussions with these craftsmen revealed that although they qualified for formal training, some did not take it up because they lacked sponsorship from contracting firms to attend DIT arranged training; or they could not afford the user fees charged in private colleges; or their trade of choice did not attract formal training e.g. steel fixing. The higher levels of formal education amongst the Kenyan craftsmen compared to other developing countries may be courtesy of the government's emphasis on general education over the last 20 years.

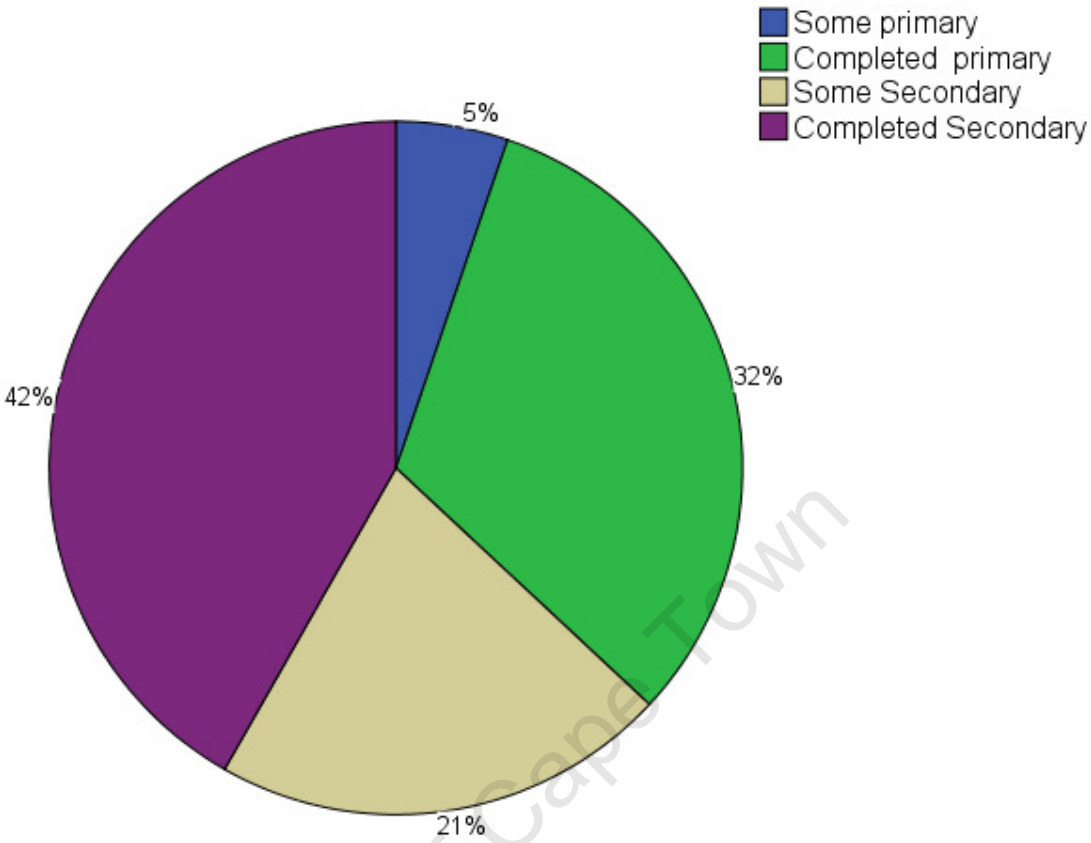


Figure 5. 3: The respondents' level of education

Table 5.4 indicates that, as with Sri Lanka (*Ibid.*), a higher percentage of plumbers and electricians had secondary education compared to those in other trades (likewise for landscapers whose sample is too small to generalise). This may again be an indicator of a higher requirement for basic science and mathematics proficiency in these trades leading to the exclusion of inappropriately educated trainees. A significant number of informally employed craftsmen therefore meet the education requirement of formal apprenticeship, suggesting that the collapse of the latter was not due to the inadequacy of suitable educated trainees.

Table 5. 4: Relationship of level of education and trade

Respondents trade * respondents highest level of education Cross tabulation						
Respondents trade		Respondents highest level of education				
		Some primary	Completed primary	Some Secondary	Completed Secondary	Total
Mason	Count	9	61	22	34	126
	% within respondents trade	7.1%	48.4%	17.5%	27.0%	100%
Carpenter & joiner	Count	4	40	19	23	86
	% within respondents trade	4.7%	46.5%	22.1%	26.7%	100%
Electrical wireman	Count	2	8	9	49	68
	% within respondents trade	2.9%	11.8%	13.2%	72.1%	100%
Plumber pipe fitter	Count	1	11	11	48	71
	% within respondents trade	1.4%	15.5%	15.5%	67.6%	100%
Painter decorator	Count	5	22	25	21	73
	% within respondents trade	6.8%	30.1%	34.2%	28.8%	100%
Steel fixer	Count	1	4	7	13	25
	% within respondents trade	4.0%	16.0%	28.0%	52.0%	100%
Plasterer	Count	3	5	3	2	13
	% within respondents trade	23.1%	38.5%	23.1%	15.4%	100%
Welder fabricator	Count	1	7	10	14	32
	% within respondents trade	3.1%	21.9%	31.2%	43.8%	100%
Landscaper	Count	0	0	0	4	4
	% within respondents trade	.0%	.0%	.0%	100%	100%
Total	Count	26	158	106	208	498
	% within respondents trade	5.2%	31.7%	21.3%	41.8%	100%

Note: Highlight shows trades with high entrants with secondary education

5.2 CRAFTSMEN SKILLS AND SKILLING

This second section reports on the skills that the informal craftsmen posses; how they acquired the skills and other issues related to skilling.

Trade skills

Informal craftsmen have generally followed the similar craft demarcations as the formal sector (Table 5.5). These demarcations follow traditional crafts and are dictated mainly by the prevailing technology and materials e.g. the prevalence of the use of stones.

Table 5. 5: Respondents' trade classification

Respondents Trade	Frequency	Percent
Mason	126	25.3
Carpenter & joiner	86	17.3
Electrical wireman	68	13.7
Plumber pipe fitter	71	14.3
Painter decorator	73	14.7
Steel fixer	25	5.0
Plasterer	13	2.6
Welder fabricator	32	6.4
Landscaper	4	0.8
Total	**498**	**100**

In addition to the formally recognised trades, some informal craftsmen have specialised in skills like steel fixing, plastering, welding/fabrication and landscaping (classification as per market practices). Steel fixing developed into a trade with the encouragement of Indian contractors, due to the popularity of *in-situ* reinforced concrete particularly in high rise building. In this form of construction the bending and fixing of reinforcement is done manually hence encouraging the development of steel fixing into a significant skill. Steel fixing is, however, limited to fixing reinforcement only and does not extend to tasks involved in structural steel work which is executed by the welder fabricator. Plastering is a common finish, which is traditionally part of the masonry trade but over time it has evolved into a speciality demanding more precision than other masonry work such as wall construction. Accordingly, plastering as a speciality is driven by competition in the market place where some masons seek to differentiate themselves so as to attract a higher wage rate. The growth of the plastering and steel fixing trades are indicative of the deskilling of the masonry trade (Clarke, 1992a). This deskilling is driven mainly by the prevalence of a particular technology in the construction sector (in-situ concreting and plastering) which ensures that craftsmen can afford to specialise in certain trade tasks yet still find continuous work.

Similarly, the welding/fabrication trade (equivalent to the metal worker) has grown as a consequence of the increased use of metal in various components including

casements, burglar proofing, door leaves, gates, balustrades, and structural steel work. Although it is a formally recognised trade under the DIT, it is not grouped among construction crafts but under the welder and general fitter trade. Landscaping in contrast is an emerging occupation resulting from the growing emphasis by clients on outdoor environment particularly different forms of gardening. Landscaping was introduced as a certificate level course in 1990 in a training institution and currently has few practitioners.

The DIT does not recognise steel fixing, plastering and landscaping as trades and hence offers no formal curriculum, training or testing for these skills. This suggests that it is the construction market that is encouraging specialisation and growth of new skills amongst informal craftsmen and driving the deskilling of traditional trades such as masonry.

Most (89%) of the craftsmen selected their trade freely (Figure 5.4). Discussions with the craftsmen indicate that the process of trade selection takes place at the beginning of their careers in construction. As labourers, they observe the various trades at work and decide on which they deem most beneficial in terms of the wage rate, availability of continuous work or for which they have aptitude (and hence the ease and speed with which they could learn the trade). The interaction with various trades is facilitated by the fact that labourers on construction sites are rarely recruited to carry out any specific tasks but are assigned to various craftsmen depending on need. In a single working day, a labourer may work with craftsmen from a number of different trades. In addition, unskilled labour tends to change workplaces often, sometimes on daily basis, depending on the wage rate and availability of work. Since across-sites projects are at different stages of completion, the labourer is exposed to various trades and phases of work. The labourer is thus exposed to an *ad hoc* multi-skilled induction process *albeit* with no structure. Moreover, the induction provides the labourers (potential craftsmen) a broad understanding of the site production process that will be beneficial when working with diverse trades and multiskilling.

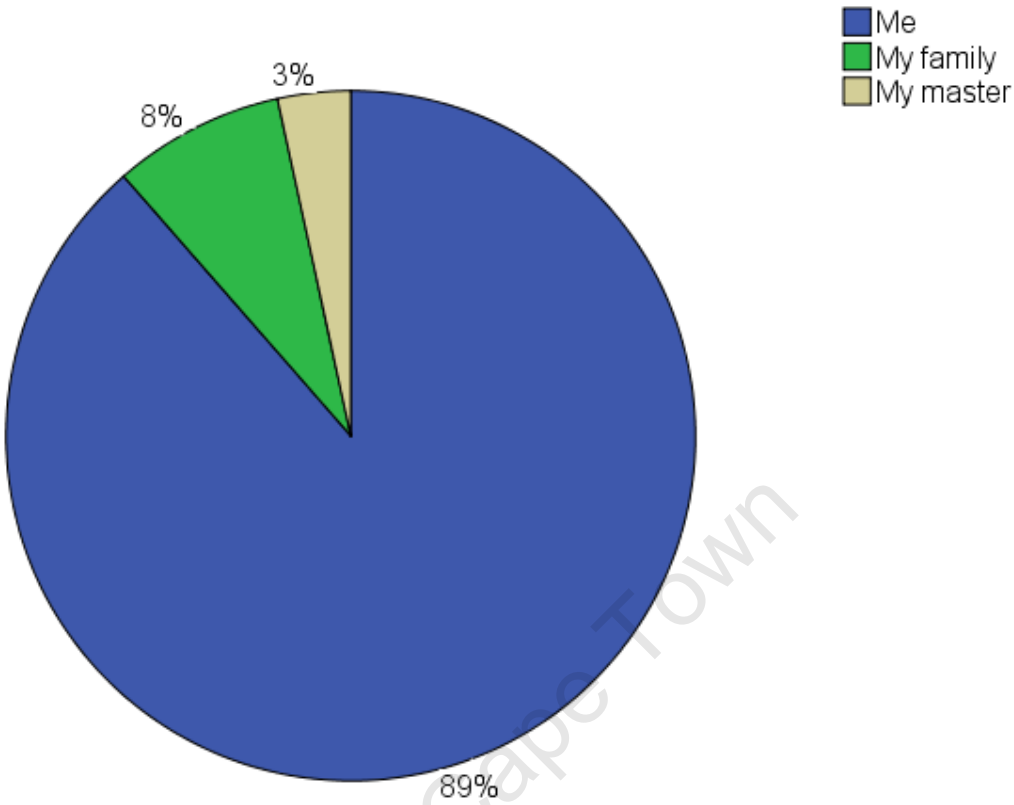


Figure 5. 4: Party who chose trade for the respondent

For those trained in colleges prior to joining the construction sector, choice of trade was dictated by their personal preferences governed by their vetting of the various practicing craftsmen using a similar gauge as the labourers. For those craftsmen recruited to a trade by relatives (8%) e.g. fathers, brothers and masters (3%), they too started off as labourers but their exposure was limited to the specific trade of the relative or chosen master. Trade selection among informal craftsmen is thus closely associated with the entrant's experience as a labourer, their perception of the market and influence from relatives/masters.

Trade profiles

Informally employed craftsmen practice a wide range of trade skills which were matched (via cross-tabulation) to the various trades to create typical trade profiles. The resulting categories in Table 5.6 highlight the most practised trade skills in each craft.

Table 5. 6: Prevalence of multiple trade skills among respondents

Trade multiskills * respondents trade Cross tabulation											
Trade multiskills		Respondents trade									
		Mason	Carpenter & joiner	Electrical wireman	Plumber	Painter	Steel fixer	Plasterer	Welder Fabricator	Landscaper	Total
Cement works	Count	125	2	0	0	1	2	5	0	0	135
	% within trade	99.2%	2.3%	.0%	.0%	1.4%	8.0%	38.5%	.0%	.0%	27.1%
Wood works	Count	0	84	0	2	0	1	0	0	0	87
	% within trade	.0%	97.7%	.0%	2.8%	.0%	4.0%	.0%	.0%	.0%	17.5%
Electrical works	Count	0	0	66	1	0	0	0	0	0	67
	% within trade	.0%	.0%	97.1%	1.4%	.0%	.0%	.0%	.0%	.0%	13.5%
Plumbing works	Count	0	0	2	68	0	0	0	0	0	70
	% within trade	.0%	.0%	2.9%	95.8%	.0%	.0%	.0%	.0%	.0%	14.1%
Painting/ Glazing	Count	0	0	0	0	71	0	0	0	0	71
	% within trade	.0%	.0%	.0%	.0%	97.3%	.0%	.0%	.0%	.0%	14.3%
Metal works	Count	0	0	0	0	0	2	0	31	0	33
	% within trade	.0%	.0%	.0%	.0%	.0%	8.0%	.0%	96.9%	.0%	6.6%
Steel fixing	Count	0	0	0	0	0	20	1	1	0	22
	% within trade	.0%	.0%	.0%	.0%	.0%	80.0%	7.7%	3.1%	.0%	4.4%
Landscaping	Count	0	0	0	0	0	0	0	0	4	4
	% within trade	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%	.8%
Finishing *	Count	1	0	0	0	1	0	7	0	0	9
	% within trade	.8%	.0%	.0%	.0%	1.4%	.0%	53.8%	.0%	.0%	1.8%
Total	Count	126	86	68	71	73	25	13	32	4	**498**
	% within trade	100%	100%	100%	100%	100%	100%	100%	100%	100%	**100%**

* Finishing includes plastering, flooring and stone dressing
Highlight indicates the most common trade multiskills for each craft

The Cramer's V statistic of 0.932 (at $p<0.001$) indicates that there is a highly significant association between the craftsman's trade and their trade multiskills. In addition, the Lambda and Goodman and Kruskal *tau* have a value of 0.900 (at $p<0.001$) again indicating that knowing the craftsman's trade is an almost perfect predictor of their trade multiskills.

Accordingly, the trade skills practised by the informally employed craftsmen can be classified into three categories; broad skills, specialist skills and narrow specialisms. The broadly skilled craftsmen are multiskilled and perform a wide range of works within their skill category (Clarke and Wall, 1998a). These crafts include the masonry and carpenter/joiner trades. Masons acquire broad trade skills that revolve around tasks that use cementacious materials. These skills include masonry, bricklaying, concreting including steel fixing, fixing metal openings, stone dressing, plastering, tiling, and flooring (includes screeding, terrazzo and granolithic finishes, tiles, and paving slabs). The carpenter/joiner craft practises skills related to wood materials. These include all works associated with carpentry, joinery (timber openings, fixtures and fittings), roofing with timber structure including fixing the associated coverings, fixing timber formwork and scaffolding and ceiling finishes.

The specialist trades execute all tasks within their trade but are not limited to a particular material. Craftsmen in this category include the electrical wireman, plumber/pipe fitter, painter/decorator and welder/fabricator trades. The electrical wireman engages in laying conduits, wiring and fixing electrical fittings, while the plumber lays different types of pipes, pipe fittings and fixes all sanitary fittings. In addition to these skills, some of the electrical wiremen and plumbers reported executing minimal finishing work e.g. laying tiles and painting but this was limited to making good affected surfaces during maintenance work. The painter/decorator trade carry out all painting/decorating to internal and external surfaces, sign writing and glazing works (to both timber and metal openings). The combination of painting and glazing works arises from the proximity of scheduled tasks (i.e. painting and glazing are usually undertaken together as the final tasks in the building process). It thus reflects the clustering of tasks that are easily interfaced. The welder/fabricator executes tasks limited to metal work including fabrication of metal openings (casements, doors, and gates), burglar-proofing, balustrades and structural metalwork.

The narrow specialists compose of the craftsmen who specialise in particular tasks that are fragmented from the broad trades and of those working in emerging skills. They include the steel fixer, plasterer, stone dresser and the landscaper whose

tasks are limited to outdoor gardening e.g. planting flowers, grass, trees and rock gardens.

Some of the skills found in other construction sectors have not developed into trades in Kenya. For example, in the absence of stringent implementation and policing of health and safety regulations, scaffolding is not a trade but the skill is practised by all the craftsmen with each constructing his working platform. For instance, in multi-storeyed buildings the craftsmen from the different trades jointly construct the shared scaffolding. However, since scaffolding is commonly constructed of timber the carpenters tend to take a leading role in its construction particularly on multi-storeyed buildings. None of the craftsmen had plant operating skills and this reflects the low levels of mechanisation on Kenyan building sites. Moreover, when basic equipment is needed (typically concrete mixers and vibrators), it is usually hired from rental firms who insist on their own operators to ensure that the equipment is safely and properly used in an attempt to minimise damage to expensive and scarce plant. This practice has detached the needs for plant operation skills from the informal craftsmen.

In addition to the above classifications, a special category of the craftsmen designated as 'lead craftsmen' were identified. The lead craftsman is in-charge of all the construction works and is the main liaison with the client under the informal procurement system (Wachira *et al.*, 2007). All the lead craftsmen were sourced from the broadly skilled trade categories, that is, masonry and carpenter/joiner (Table 5.7) but with the majority (81%) being masons. This is further attested by the medium association between the respondents trade and appointment as a lead craftsman as indicated by the Cramer's V statistic of 0.603 (at $p<0.001$).

Table 5. 7: Lead craftsmen's trade and multi-skills

Respondents trade * multi skills for lead craftsmen Cross tabulation									
Respondents trade	Multiskills for lead craftsmen								Total
	Cement works	Wood works	Painting	Cement works & Painting	Wood works & Painting	Wood works & Plumbing	Plumbing & painting	Metal worker	
Mason	35	22	4	0	8	2	1	1	73
Carpenter	7	5	2	3	0	0	0	0	17
Total	42	27	6	3	8	2	1	1	**90**

Discussions with the craftsmen indicated that it is easier for a mason to become a lead craftsman for two main reasons. Firstly, the mason is advantaged by being the first craftsman that the client contacts during the commencement of construction because his skills are required for foundation works (e.g. concreting and walling). Secondly, the masonry trade, as a consequence of its versatility, is involved throughout the site production stages from the concreting in foundations, to walling in the structure, to plastering in the finishing stage. This continuous involvement enables the masons to develop a more long term relationship with the clients giving them an advantage over other trades that are engaged for relatively shorter periods on the site.

In addition to being broadly skilled, the majority of lead craftsmen have 'bolted on' (Clarke and Wall, 1998a) multi-trade skills. Table 5.7 indicates that the most common 'bolted on' skills entail a combination of cement works, woodwork and painting skills. This combination is popular because cement and woodworks encompass the bulk of building tasks. The lead craftsmen require both the broad and 'bolted on' skills to supervise the construction works and to assist the client in vetting the skilfulness of craftsmen applicants (Wachira *et al.*, 2007).

Trade skilling

The majority (75%) of informally employed craftsmen acquired their trade skills via informal skilling which includes, *inter alia*; informal apprenticeship with Asian or African contractors or with self-employed master craftsman; via experience (observing and doing); or in village/youth polytechnics (Table 5.8).

As previously explained (Section 2.3), informal training in Kenya has its genesis in the Indian model of skilling. The craftsmen revealed that informal skilling was most appealing to those with low levels of education because of its less stringent requirements, particularly the minimal theoretical input. In addition, their lower economic capability suits the exclusion of user fees in informal training. Training at the village/youth polytechnics is grouped under informal skilling in this study because these institutions target primary school graduates who are not eligible for formal craft training. Moreover, the trainers in these polytechnics are usually unschooled but experienced local craftsmen leading to training that has all the

characteristics of informal skilling particularly emphasis on productivity and minimal theoretical input.

Table 5. 8: Method of initial skill acquisition

Method of training	Frequency	Percent
DIT	3	0.6
College – Institutes of technology/NYS/CITC/JKUAT	109	21.9
Village/Youth polytechnic	103	20.7
Apprenticeship with European contractor	9	1.8
Informal apprenticeship with Asian contractor	14	2.8
Informal apprenticeship with African contractor	19	3.8
Informal apprenticeship with master	81	16.3
Experience	153	30.7
Prison training	6	1.2
Material manufacturer	1	0.2
Total	**498**	**100**

The prevalence of informal skilling is driven by its legitimacy amongst many employers (contractors and private developers), coupled with its ability to cater for many trainees that are excluded from formal apprenticeships. This notwithstanding, informal skilling is not formally accepted or recognised as a form of craftsmen training by the training and education authorities. Graduates of informal training are thus regarded as unskilled operatives in the formal sector, unless they attempt and pass the trade tests. The high percentage of craftsmen trained via informal skilling asserts the significance of this form of training in meeting the human resource needs of the Kenyan construction sector.

A significant number of informally employed craftsmen (24%) were trained formally in colleges, DIT and prison. Table 5.9 indicates that many of those formally trained are from the electrical and plumbing trades. This again would seem to indicate that the skills in these trades are more difficult to acquire informally relative to the other trades, possibly because they require higher theoretical input to be effective in practice. Specialisms resulting from the deskilling of the masonry trade (steel fixing and plastering) are wholly acquired informally; an indication that because they are not formally recognised they do not attract any formal training. Table 5.8 above

indicates that only 2% of the craftsmen were trained via formal apprenticeship in European contracting firms, although this maybe a reflection of the decreasing number of European firms operating in Kenya.

Table 5. 9: Prevalence of formal and informal training amongst trades

Respondents trade * formal versus informal skilling Cross tabulation				
Respondents trade		Formal versus informal skilling		
		Formal training	Informal training	Total
Mason	Count	11	115	126
	% within respondents trade	8.7%	91.3%	100%
Carpenter & joiner	Count	13	73	86
	% within respondents trade	15.1%	84.9%	100%
Electrical wireman	Count	44	24	68
	% within respondents trade	64.7%	35.3%	100%
Plumber pipe fitter	Count	42	29	71
	% within respondents trade	59.2%	40.8%	100%
Painter decorator	Count	2	71	73
	% within respondents trade	2.7%	97.3%	100%
Steel fixer	Count	0	25	25
	% within respondents trade	.0%	100%	100%
Plasterer	Count	0	13	13
	% within respondents trade	.0%	100%	100%
Welder fabricator	Count	3	29	32
	% within respondents trade	9.4%	90.6%	100%
Landscaper	Count	3	1	4
	% within respondents trade	75.0%	25.0%	100%
Total	Count	118	380	**498**
	% within respondents trade	23.7%	76.3%	**100%**

Note: Highlight indicates trades with the highest formal and informal training

In a similar manner, Table 5.10 indicates that 75% of the craftsmen acquired multi-trade skills via informal skilling. This suggests that there is minimal cross-training between the formal and informal skilling, hence those who start with informal skilling tend to acquire all their skill informally and *vice versa* as attested by the Cramer's V statistic of 0.590 (at $p<0.001$) indicating medium association. Moreover, more than half (51%) of the craftsmen acquired these skills by watching others and experience, an increase of 20% above the number that acquired initial trade skills using the same method (Table 5.8). This suggests that initial trade skill acquisition is not

sufficient for full craftsmanship, hence the craftsmen requires additional time to learn and perfect the range of skills within their trade. Skills training is thus a continuum, commencing with initial trade skilling followed by gradual acquisition of the respective trade multiskills.

Table 5. 10: Methods of acquisition of multiple trade skills

Method of learning trade multi skills	Frequency	Percent	Valid Percent
DIT	24	4.8	5.2
Colleges of technology	84	16.9	18.2
Village/Youth polytechnic	66	13.3	14.3
Formal apprenticeship with contractor	2	0.4	0.4
Informal training with contractor	8	1.6	1.7
Informal apprenticeship with master	21	4.2	4.6
Watching others/Experience	252	50.6	54.7
Material manufacturer	4	0.8	0.9
Total	461	92.6	100
Narrow specialists – no multi-skills	37	7.4	
Total	**498**	**100**	

Given that informal skilling typically lacks specific training regulations, the period of training for the informal craftsmen was deemed to be the time it took for them to be hired as craftsmen. The period the craftsmen trained and what they deem to be an appropriate length of training in their trade varied both within and between the trades (Tables 5.11 and 5.12). Nevertheless, 12 and 24 months was the most frequently selected period for all the trades. This suggests that the sector's norm is within this range, except for electricians and plumbers who are trained formally; typically taking 36 months.

Table 5. 11: Training period in various trades

Respondents trade * length of training Cross tabulation										
Respondents trade		How long did you train in months?								
		3	6	12	18	24	30	36	48	Total
Mason	Count	5	17	29	10	48	2	9	6	126
	% within trade	4.0%	13.5%	23.0%	7.9%	38.1%	1.6%	7.1%	4.8%	100%
Carpenter & joiner	Count	2	6	17	4	47	2	7	1	86
	% within trade	2.3%	7.0%	19.8%	4.7%	54.7%	2.3%	8.1%	1.2%	100%
Electrical wireman	Count	1	1	5	4	19	1	35	2	68
	% within trade	1.5%	1.5%	7.4%	5.9%	27.9%	1.5%	51.5%	2.9%	100%
Plumber pipe fitter	Count	0	2	8	5	15	1	40	0	71
	% within trade	.0%	2.8%	11.3%	7.0%	21.1%	1.4%	56.3%	.0%	100%
Painter decorator	Count	11	20	24	6	9	1	2	0	73
	% within trade	15.1%	27.4%	32.9%	8.2%	12.3%	1.4%	2.7%	.0%	100%
Steel fixer	Count	3	7	9	2	4	0	0	0	25
	% within trade	12.0%	28.0%	36.0%	8.0%	16.0%	.0%	.0%	.0%	100%
Plasterer	Count	1	4	3	1	3	0	1	0	13
	% within trade	7.7%	30.8%	23.1%	7.7%	23.1%	.0%	7.7%	.0%	100%
Welder fabricator	Count	1	4	12	8	6	0	1	0	32
	% within trade	3.1%	12.5%	37.5%	25.0%	18.8%	.0%	3.1%	.0%	100%
Landscaper	Count	0	0	0	0	2	0	2	0	4
	% within trade	.0%	.0%	.0%	.0%	50.0%	.0%	50.0%	.0%	100%
Total	Count	24	61	107	40	153	7	97	9	**498**
	% within trade	4.8%	12.2%	21.5%	8.0%	30.7%	1.4%	19.5%	1.8%	**100%**

Note: Highlight indicates the most common training period for each trade

Additionally, most of the craftsmen recommended appropriate training periods that were equivalent to or less than their own period of training. This suggests that craftsmen try to replicate their own training experiences when coaching new entrants and deem themselves to be better trainers than their masters, hence increasing the possibility of shortening the training period over time. The replication of past training practices over time may, in addition, be a reflection of the absence of any training of trainers programs, which might alter existing training methods and consequently training periods. Moreover, given that informal training typically perpetuates existing technologies (Johanson and Adams, 2004), the need to augment the training periods between the time the craftsmen trained to when they take on trainees is diminished, as new skill areas are rarely introduced.

Table 5. 12: Appropriate training periods in various trades

Respondents trade * appropriate training period Cross tabulation									
Respondents trade		What training period is appropriate for your trade in months?							
		3	6	12	18	24	30	36	Total
Mason	Count	8	31	31	4	35	3	14	126
	% within trade	6.3%	24.6%	24.6%	3.2%	27.8%	2.4%	11.1%	100%
Carpenter & joiner	Count	3	8	18	5	41	4	7	86
	% within trade	3.5%	9.3%	20.9%	5.8%	47.7%	4.7%	8.1%	100%
Electrical wireman	Count	0	1	10	3	13	1	40	68
	% within trade	.0%	1.5%	14.7%	4.4%	19.1%	1.5%	58.8%	100%
Plumber pipe fitter	Count	0	3	8	5	15	0	40	71
	% within trade	.0%	4.2%	11.3%	7.0%	21.1%	.0%	56.3%	100%
Painter decorator	Count	14	39	10	1	6	0	3	73
	% within trade	19.2%	53.4%	13.7%	1.4%	8.2%	.0%	4.1%	100%
Steel fixer	Count	1	8	10	1	4	0	1	25
	% within trade	4.0%	32.0%	40.0%	4.0%	16.0%	.0%	4.0%	100%
Plasterer	Count	1	7	3	1	1	0	0	13
	% within trade	7.7%	53.8%	23.1%	7.7%	7.7%	.0%	.0%	100%
Welder fabricator	Count	1	5	22	1	3	0	0	32
	% within trade	3.1%	15.6%	68.8%	3.1%	9.4%	.0%	.0%	100%
Landscaper	Count	0	0	0	0	3	0	1	4
	% within trade	.0%	.0%	.0%	.0%	75.0%	.0%	25.0%	100%
Total	Count	28	102	112	21	121	8	104	**498**
	% within all trades	5.6%	20.5%	22.5%	4.2%	24.3%	1.6%	20.9%	**100%**

Note: Highlight indicates the most common training period chosen as appropriate for each trade

Unlike formal training where the training period is standardised at 36 months for all trades (DIT, 2008c), informal skilling differentiates the training period between differing trades (Table 5.13). The only exceptions are the electrical wireman and plumbing trades that have a higher incidence of formal training and hence an average training period of 36 months. This suggests that informal craftsmen generally consider different trades to require different training periods depending mainly on the range of skills in the respective trades but also the perceived difficulty of honing the skills. For example, the broad trades of masonry and carpentry that comprises a wide range of skills take 24 months, while a specialism like plastering takes only 6 months. In addition, the diverse training periods for different trades amongst informally employed craftsmen may be a reflection of the norms in the craft

market, that acknowledge that the difficulty in acquiring craft skills varies between trades as reflected in the training periods.

Table 5. 13: Average training lengths

Trade	Actual period (months)	Recommended period (months)
Mason	24	24
Carpenter/joiner	24	24
Electrical Wireman	36	36
Plumber pipe fitter	36	36
Painter decorator	12	6
Steel fixer	12	12
Plasterer	6	6
Welder fabricator	12	12
Landscaping	24	24

Skill upgrading

Skills upgrading is necessary to prepare craftsmen for changes in the construction sector for instance, new technology, materials, components and processes (CIB, 1998). Nevertheless, the majority (80%) of the informally employed craftsmen do not formally upgrade their skills after their initial training (Table 5.14).

Table 5. 14: Prevalence of formal skill upgrading

Formal skill upgrade	Frequency	Percent
Yes	100	20.1
No	398	79.9
Total	**498**	**100.0**

The lack of formal skill upgrading does not necessarily imply that these craftsmen are not updating their skills but rather that the format of their training continues to be informal. The minimal formal skill upgrading among informally employed craftsmen is a clear indication of their exclusion from formal training programs and the absence of interventions to integrate them into the formal system, for example, via formalisation of their skills through competence based accreditation. This could potentially create mobility barriers between the formal and informal construction

sector as skills are not mutually recognised. Moreover, the informal craftsmen perception that formal training programs are unsuited to their work environment coupled with the lack of recognition of informal prior learning makes the upgrading courses unattractive to the informally trained. In addition, the low levels of technological changes in the Kenyan construction sector exert minimal pressure to alter the traditional craft skills making upgrading less pressing.

Where skill upgrading occurs, Table 5.15 shows DIT as the most significant provider (62%), particularly among the electrical wiremen and plumber pipe fitters. Formal colleges too offer skill upgrading (14%) chiefly to both trades. The craftsmen explained that these trades have a higher incidence of skill upgrading because of the relatively higher levels of technological change for example, introduction of electronics coupled with the widening variety of fittings in the market demand additional knowledge. Accordingly, the Cramer's V statistic is 0.501 (at $p<0.001$) indicating a medium association between institution of skill upgrading and trade. Material manufacturers, specifically the paint manufacturing companies, are also offering skill upgrading to informal craftsmen in Kenya. Such training is limited to short courses (single day) and contents cover only the products of the respective company. This reflects the potential of involving manufacturers in training informal craftsmen, particular in view of their influence on the clients' choice of materials in the absence of a general contractor.

Table 5. 15: Institution of skill upgrading

Institution of skill upgrade course	Frequency	Percent
DIT	62	62
Other colleges	14	14
Village polytechnic	9	9
Material manufacturers	14	14
Other – NGO	1	1
Total	**100**	**100**
None	398	
Total	**498**	

In tandem with the lack of formal training, 57% of informally employed craftsmen do not hold a trade test certificate (Figure 5.5). This is a proxy for the diminished value

of the trade certificate in the Kenyan construction sector. Its decline in value is a consequence of the dominance of the informal construction sector which typically does not value formal skill accreditation. In addition, it confirms the weak link between output based forms of engagement and accreditation (Clarke and Wall, 1998a) and suggests that employers prefer alternative modes of skill certification.

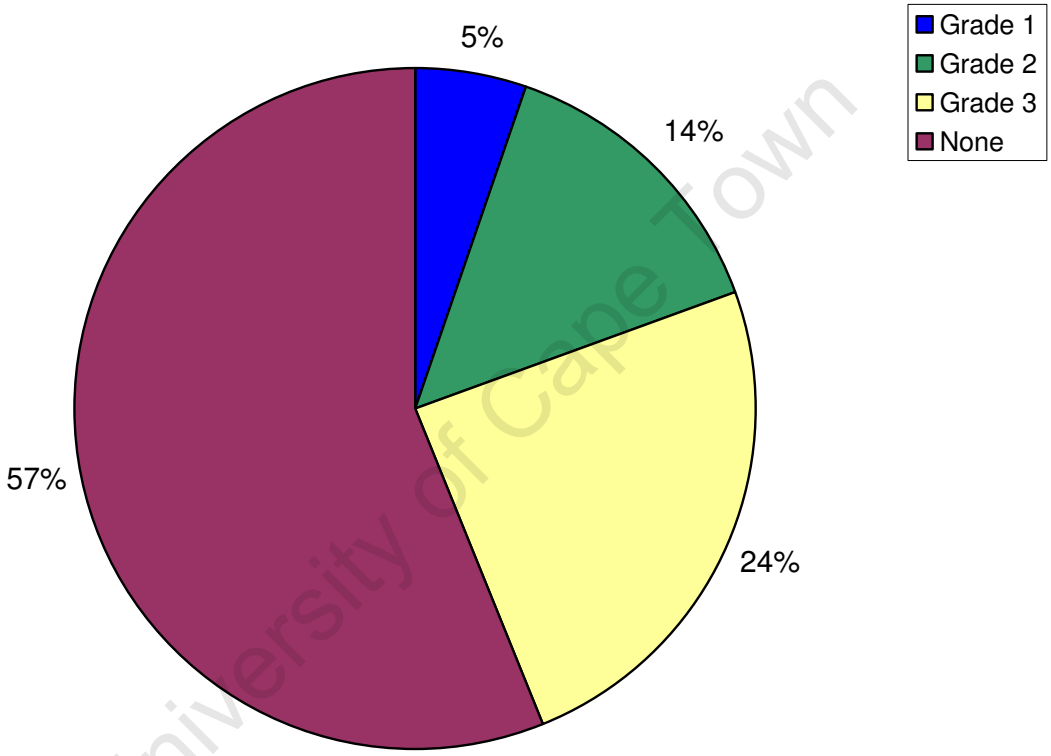


Figure 5. 5: Craftsmen with trade test certificate

Less than half (43%) of the informally employed craftsmen possess trade test certificates. Of these, more than half (56%) had the minimum Grade 3 certification which represents a narrow skilled person working under supervision and only 12% had achieved Grade one which is the master craftsman level (DIT, 2008f). Skill upgrading forms the basis for craft progression through the grades in the formal sector as exemplified by the significant association (Cramer's V = 0.675 and 0.813

at p<0.001) between the category of grade and skill upgrading and institution offering the upgrading course. The informal craftsmen explained that in absence of grading, their progression is measured by their experience and reputation as exemplified by the number of projects they had completed.

Possession of a trade test certificates is closely linked with formal training (Table 5.16). Accordingly, DIT, Colleges and formal apprenticeship (consequently electricians and plumbers) have a higher prevalence of trade tested graduates. The significant number of trade tested village polytechnic graduates demonstrates the concerted effort by the government and parents in recent years to formalise the institutions by offering portable and certifiable skills (Boeh-Ocansey *et al.*, 1995). However, due to their informal skilling approach, these polytechnics rarely offer training beyond the minimum grade 3 trade tests which emphasises practical ability when compared to higher grades that require increasing levels of theoretical input which is a challenge to their instructors.

Table 5. 16: Method of training versus possession of a trade test cert.

Method of training * possession of a trade test cert? Cross-tabulation			
How did you train?	Do you have a trade test cert?		Total
	Yes	No	
DIT	3	0	3
College - Inst of tech/NYS/CITC/JKUAT	94	15	109
Village/Youth polytechnic	88	15	103
Apprenticeship with European contractor	5	4	9
Informal apprenticeship with Asian contractor	2	12	14
Informal apprenticeship with African contractor	2	17	19
Informal apprenticeship with master	5	76	81
Experience	13	140	153
Prison training	6	0	6
Material manufacturer	0	1	1
Total	**218**	**280**	**498**

The relationship between the possession of a trade test and method of training is significant. The Goodman and Kruskal tau statistic was 0.61 (at p<0.001) indicating that knowing that a craftsman had a trade test certificate, there is a more than 61%

reduction in error of predicting how they trained. The Cramer's V coefficient indicates that these variables have a highly significant relationship of 0.78 (at $p<0.001$) hence the relationship is unlikely to have happened by chance. Due to the link between formal training and the electrical and plumbing trades, the possession of a trade test is associated to recruitment (0.732); trade (0.505); and length of training (0.616) (all at $p<0.001$). This confirms that the trade test is associated with formal skill training therefore craftsmen trained via informal skilling have minimal regard for it.

The low levels of trade certification amongst craftsmen in Kenya additionally indicates that employers place minimal value in formal skill accreditation as is the case in South Africa and Indonesia (Cattell, 1997; Alwi *et al*., 2006). Moreover, the majority of contractors in Kenya are Indian-controlled firms who have never accepted the formalisation of craft skilling but prefer informal on-the-job training and the informal procurement clients depend on informal methods of skill assessment like word of mouth references. Together these form the majority of demand for craft skills in the construction sector. Consequently, Table 5.17 indicates that 68% of these craftsmen have never lost a job due to lack of a trade test certificate, further eroding the utility of the certificate. Given that formal skill upgrading usually occurs in formal colleges that advocate formal skill certification, those who upgrade their skills are least likely to be denied a job due to lack of trade test as indicated by the highly significant association (Cramer's V = 0.737 at $p<0.001$) between these variable.

Table 5. 17: Percentage of craftsmen denied work due to lack of trade test

Craftsmen denied a job because of lack of trade cert	Frequency	Percent
Yes	160	32.1
No	338	67.9
Total	**498**	**100**

Government institutions, European contractors and direct clients are the most likely to require craftsmen to produce the trade certificate (Table 5.18). The first two employers have always supported formalised training while those direct clients (or

their representatives) that require trade certifications are those that work in the construction sector e.g. engineers, architects and quantity surveyors. Given that these are currently the minority employers in the construction sector, their influence is much less. It is noteworthy that, while the public sector institutions require trade certification among their employees, such requirement is not extended to craftsmen engaged by contractors working on public funded projects. The minimal grading is a further indicator of the segmentation of the craftsmen in the Kenyan construction sector into a market for those who are graded and those who are not leading to inflexibilities in the mobility of skills.

Table 5. 18: Type of client denying craftsman work due to lack of a trade test

Client requiring proof of formal certification	Frequency	Percent
Government institution	75	15.1
European contractor	24	4.8
Direct client	56	11.2
NGO	5	1.0
None	338	67.9
Total	**498**	**100**

Generic skills

In addition to the trade skills and in contrast with the formal training curriculum, informally employed craftsmen are acquiring generic skills. Figure 5.6 shows the common types of generic skills acquired by the craftsmen including specification of materials, estimation of resources, preparation of quotations, and supervision of construction work. Generic skills are generally practised within the limits of the craftsman's respective trade e.g. a plumber can only specify plumbing materials while a painter can only supervise painting works. However, for the lead craftsman who oversees the whole construction process under the informal procurement system, his generic skills extend to all the building trades e.g. he prepares quotations for works of all the trades and supervises all the trades. This suggests that the acquisition of generic skills is part of the progression of the informal craftsmanship following subsequently to the attainment of trade skills.

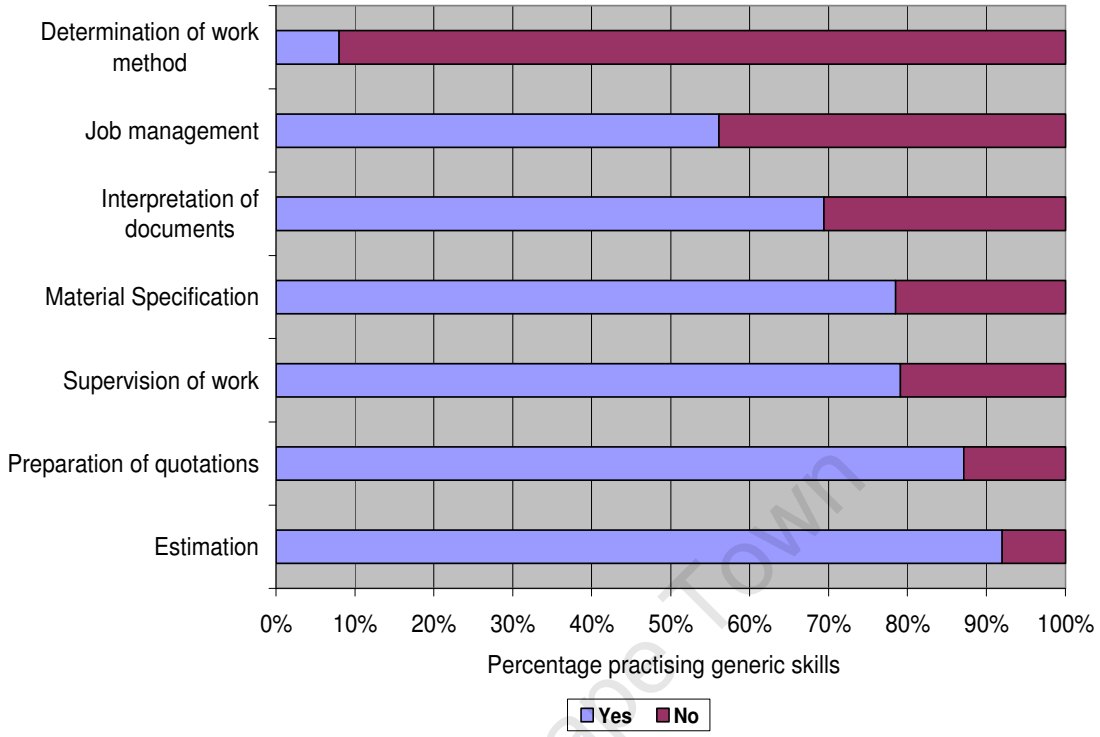


Figure 5. 6: Craftsmen generic skills

Generic skills are practiced mainly by craftsmen engaged in the informal procurement system and informal subcontracting. Accordingly, many of these skills are inspired by the new terms of engagement of the craftsmen in an increasingly informalised construction sector (Wachira *et al.*, 2007). For example, the preparation of quotations, supervision, job management, and determination of work method are all traditionally executed by the general contractor in formal procurement. However, the absence of the general contractor, coupled with the inexperience of clients in construction matters, under the informal procurement mode of construction, creates a skills gap in the site production process, which the craftsmen are satisfying. Additionally, the craftsmen acquire skills that consultants provide in the formal construction process e.g. specification of the type and quality of materials, which is ideally in the domain of architects and estimation of resources and interpretation of documents which is in the domain of quantity surveyors. This indicates that the craftsmen are filling the gap created by the declining engagement of contractors and professionals within the informal sector because, in comparison to their inexperienced clients', craftsmen afford the best alternative.

The generic skills acquired by the craftsmen are limited to those that are directly applicable to their work environment. Consequently, because of the low levels of mechanisation in the informal construction sector, few craftsmen have skills related to the selection of appropriate of machinery. Furthermore, none of the craftsmen reported performing entrepreneurial duties, possibly a reflection of their engagement mainly as individual self-employed craftsmen rather than as firms.

Studies in various construction sectors have shown that craftsmen are motivated to acquire additional skills by, *inter alia,* the increased potential earnings, more continuous employment, more challenging work, easier work physically and interest in new skills (Alster, 1989; Burleson *et al.*, 1998; Haas *et al.*, 2001; Gomar *et al.*, 2002; Carley *et al.*, 2003). In contrast, for Kenyan informal craftsmen, the overriding reason (99%) for acquiring generic skills is to conform to the requirements of the informal procurement clients (Figure 5.7). This reason applies to all the trades irrespective of the mode of training as indicated by the medium associations between these variables (Cramer's V = 0.576 at $p<0.001$).

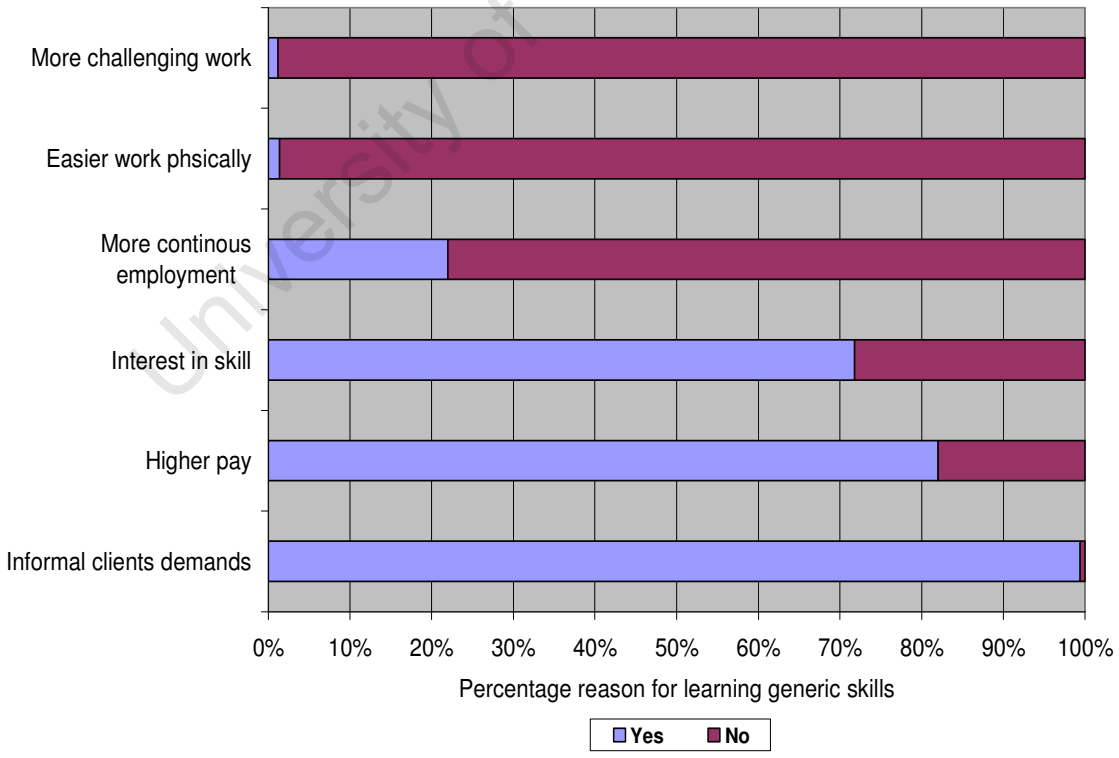


Figure 5. 7: Reason for craftsman learning generic skills

The finding that informal clients' demands are the main drivers for acquisition of generic skills demonstrates the significant impact of the informal procurement system on the set of skills required of the craftsmen. Moreover, it indicates the ability of informally employed craftsmen to adapt rapidly to the changing demand for skills in the construction sector. This rapid adjustment is enabled by the flexibility of informal training courtesy of its lack of a rigid curriculum. The other significant reasons as reported by the craftsmen are higher pay (82%), interest in skill (72%) and more continuous employment (22%). Discussions with the craftsmen indicate that those who learn generic skills are in a better position to negotiate a premium wage because they can demonstrate that they are adding additional value to the client by providing more than just traditional trade skills and this stimulates the interest in such skills. Additionally, these craftsmen have a greater likelihood of being appointed lead craftsmen (the client's chief advisor) which is usually accompanied by higher pay and more continuous employment (Wachira *et al.*, 2007). The other reasons identified from the literature of other construction sectors e.g. more challenging work and easier work physically, were not of significant importance to these informally employed craftsmen.

Generic skills training

As in the training for trade skills, informally employed craftsmen acquired generic skills chiefly via informal skilling (Table 5.19).

Table 5. 19: Method of acquisition of generic skills among the respondents

Method of learning generic skills	Frequency	Percent
DIT	1	0.2
Other college	4	0.8
Village polytechnic	6	1.2
Formal apprenticeship with contractor	2	0.4
Informal training with contractor	3	0.6
Informal apprenticeship with master	5	1.0
Watching others/Experience	461	92.6
Do not practice any generic skills	16	3.2
Total	**498**	**100**

The major method of this informal skilling is via watching others and experience (93%) where the older more experienced craftsmen pass on their skills to their apprentices who perfect the same over a period of time through trial and error. This is enabled by the inexperience of the informal procurement clients, coupled with the absence of any professionals to monitor and identify any errors, which allows the craftsmen the leeway to make and correct mistakes without too much fuss from the clients. Additionally, the absence of legally enforceable contracts between the clients and the craftsmen means that the latter's legal/professional liability is minimal and this, coupled with their low economic status, avails the clients little recourse against the craftsmen when things go wrong. The only recourse for the client is to fire the respective craftsman and hire another to make good any deficiencies and to proceed with the outstanding work. In addition, generic skills are not included in the craftsmen's formal training curriculum since they are not expected to execute such tasks in their traditional formal employment under the general contractor. Therefore, the craftsmen have no option but to learn the skills informally.

Employers and terms of engagement

The majority of informally employed craftsmen (67%) work for both the contractors as casual labour and directly for clients who engage in the informal procurement system (Figure 5.8). The craftsmen, like their counterparts in Tanzania (Mlinga and Wells, 2002), move between both forms of engagement depending on where work is available. A further 29% of the craftsmen work mostly for direct clients in the informal procurement system making this the most significant employer (29% + 67%). Only 4% of the craftsmen reported that they mostly worked on casual terms for the contractors, a reflection of both the declining demand for formal construction in the building subsector and the waning role of the contractors as the main employers of craftsmen.

The informally employed craftsmen expressed preference for working for direct clients mainly because of the higher wages paid in the informal sector (Wells, 2001), coupled with the tendency of the latter to allow the craftsmen more control of the work process which enhanced learning (of both the trade and generic skills), and training others. In addition, the craftsmen explained that having worked for direct clients who allowed them access to project financing issues, they were of the

opinion that contractors made high profits, hence viewing the wages paid by the latter to be exploitative. This view ignores the fact that contractors have extra expenses like insurance, taxes, and costs associated with adherence to laws and regulations that are generally ignored by private developers, hence the illusion of high returns. The preference of working directly for clients explains the popularity of generic skills amongst the craftsmen as these are mainly utilised in informal construction.

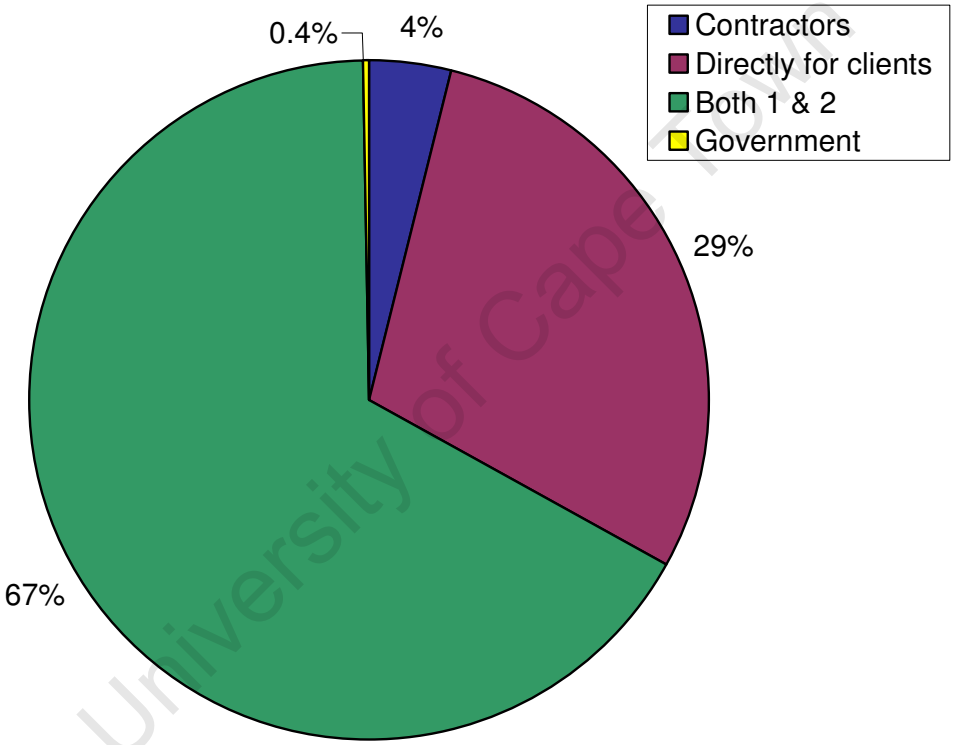


Figure 5. 8: Clients for whom the craftsmen mostly work

Table 5.20 indicates that piecework is the most common method of engagement among informal craftsmen, effectively encompassing 98% of the craftsmen (piecework plus its variations weekly, daily and contract basis).

Table 5. 20: Terms of employment of the craftsman

Terms of employment	Frequency	Percent
Daily	45	9.0
Weekly	93	18.7
Monthly	7	1.4
Contract	158	31.7
Permanent	2	0.4
Piece work	193	38.8
Total	**498**	**100**

The respondents explained that, under piecework, the craftsman dictates the period of engagement by comparing the task at hand to his estimated productivity as per his past experience with similar tasks, but this may be subject to negotiation where the employer deems it unreasonable. Under weekly and daily terms of employment that are variations of piecework, the employer dictates the time for the task depending on his estimate of the time required to accomplish the respective task, as per past experience with similar tasks or on advice from the lead craftsman. In addition, contract terms are a variation of piecework where the work in question encompasses a given section of the construction works for example a floor or section e.g. an electrical wireman will be hired to wire and fix electrical fittings to a single floor of a multi-storey building.

Further discussions with the respondents revealed that piecework engagement is attractive to both craftsmen and employers because of its perceived benefits. Earnings and the period of employment depends on productivity, so more productive craftsmen earn relatively more as they can complete the task within shorter periods and move on or negotiate additional tasks. This leads to the emphasis of productivity as the major proxy of the skilfulness of a craftsman. For contractors this mode of engagement is equally attractive because it gives them the option of laying off the craftsmen at the completion of each task hence they can easily shed off the obligations associated with permanent employment. Informal procurement system clients advocate the piecework form of engagement because it gives them the flexibility to suspend the work at the any time as dictated by the availability of

funding. Piecework therefore conforms flawlessly to their mode of construction financing where work progress is dictated by the availability of funding (Wachira *et al.*, 2007). The relationship between the employer and the terms of employment is exemplified by the Cramer's V statistic of 0.619 (at $p<0.001$), which indicated medium association.

Accordingly, the dominance of piecework as the primary mode of informal craftsmen engagement in the Kenyan construction sector is a reflection of the sectors' shift towards increased casualisation and the informal construction system as in many constructions sectors e.g. Brazil, India, Malaysia (ILO, 2001). Moreover, its prevalence implies that craftsmen are considered to be output workers hence any training is geared towards the enhancement of output usually at the expense of the acquisition of quality skills. Permanent and monthly terms of engagement are uncommon among the informal craftsmen with the few occurrences being for key craftsmen engaged by contractors as foremen or those working for government institutions.

Skill certification

Qualifications certify skills thereby enabling employers to find suitably skilled craftsmen (CIB, 1998; Grugulis, 2003). Since amongst most informally employed craftsmen standardised qualifications are absent, the employers have to devise other means of assuring themselves that the workers have the requisite skills. In the Kenyan construction sector, such means of skill certification include testimonials, word of mouth references, use of sample works, visit to previous works and trade test certificates (Figure 5.9).

The most common (58%) of these forms of assurances of skilfulness is the use of testimonials as a proxy for satisfactory vetting by others. This is common especially among specialist trades like electrical work and plumbing where the costs of sample work may be prohibitive due to the higher cost of materials and components. Moreover, the quality of work executed under these trades is difficult to vet since it is relatively more technical and is mostly hidden in the building fabric, for instance, wiring and piping. Many employers therefore accept the vetting of others who are generally more technically qualified in such fields for example, engineers and

specialist contractors. In addition, many craftsmen who in the past were employed by contractors were awarded testimonials when they were laid off while others request consultants whom they have worked with satisfactorily in the past to write testimonials. The Cramer's V statistic indicates that there is a medium association (0.556 at $p<0.001$) between the use of testimonials and those practising job management. This suggests that vetting by others is important for those appointed as lead craftsmen (those likely to practice job management skills) probably because it reassures the client by acting as a proxy of the craftsman's proven ability.

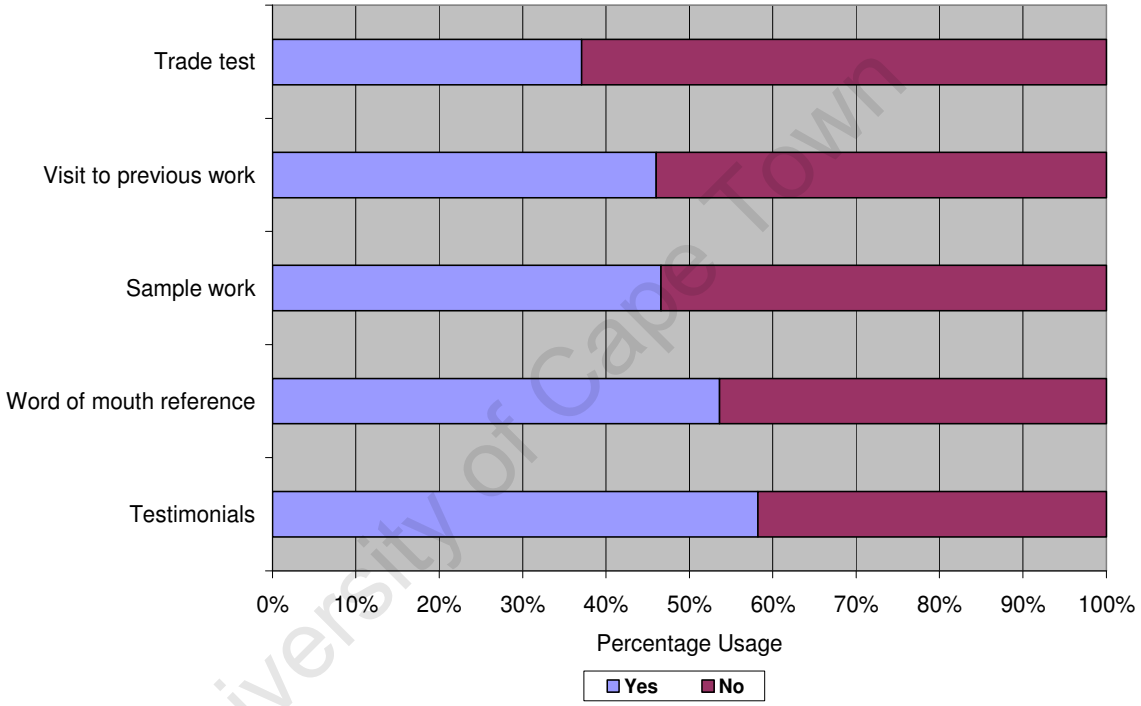


Figure 5. 9: Proof of competence to the client

Closely related to testimonials is the word of mouth reference or verbal testimonial (54%). Here the craftsman is hired because he has worked satisfactorily for others who are known to the employer or because he has a good reputation in the neighbourhood. Besides acting as a form of skill certification, testimonials and word of mouth references are a measure for the experience of the craftsman and his ability to get along with diverse employers. The popularity of these methods suggests that employers value experience above all other indicators of skilfulness.

Sample work is equally common (47%). In this method, a craftsman is asked to execute a sample task before he is hired and if its quality is deemed satisfactory he is engaged. Typically such sample work is executed as part of actual building works, (e.g. the craftsman may be asked to paint a wall), and may therefore result in the wastage of materials and labour if the outcome is unsatisfactory (probably requiring making good or demolition). This may thus be an expensive mode of skill certification but the expense is mitigated by limiting the sample work to a day's job only. In addition, the craftsmen explained that it was a common practice to pay wages for the first day of work only if the work was satisfactory further minimising the possible loss. Moreover, the use of sample work as a form of skills assessment assumes that the employer is equipped to judge the quality or otherwise of the craftsman's work. Where contractors are the employers this is a plausible assumption since they are technically qualified and experienced in construction. However, in the informal procurement system where the clients are inexperienced in construction matters, their ability to judge quality work is doubtful hence escalating the possibility of poor quality work. To address this problem, the informal clients rely on the advice of the lead craftsmen who are tasked to vet other craftsmen including the quality of their work.

Visits to previous work done by the craftsmen are the other method of skills assessment (46%). This is a measure of both quality and experience as it allows the potential employer to visually assess the skilfulness of the craftsmen and the more numerous the number of previous projects, the greater the perceived know-how of the latter. Visits to previous works are akin to sample work *albeit* on a larger scale and is based on similar assumptions.

Finally, those who have trade test certificates (37%) use them as proof of formal skill certification (Cramer's V = 0.855 at $p<0.001$). In addition, there is medium association (Cramer's V at $p<0.001$) between possessing trade certificates and recruited to construction after training (0.665); secondary school education (0.509); formal trade training (0.693) with 36 months training (0.608); and formal skill upgrading (0.593). This is further indication that formal trade certification is mainly associated with formal training.

5.3 TRAINING OTHERS

In this section the informal craftsmen were questioned about the methods they were using to propagate their skills among the new entrants in the sector and their perception on the need to augment their style of skilling. This is intended to further elaborate the skilling methods in the informal construction sector.

Number of trainees

Training in this study was deemed to encompass only those who a craftsman had coached to the level where they were able to find employment as craftsmen. The majority of the craftsmen (97%) reported that they train others in the same manner they were trained, with the highest number of those trained (49%) being in the broadly skilled trades of masonry and carpentry (Table 5.21 and 5.22).

Table 5. 21: Percentage of craftsmen who train others

Train others	Frequency	Percent
Yes	481	96.6
No	17	3.4
Total	**498**	**100**

Table 5. 22: Number of trainees versus trade

Respondents trade * number of trainees Cross tabulation							
Respondents trade	How many trainees have you trained so far?						Total
	1 to 2	3 to 4	5 to 6	7 to 8	9 to 10	More than 10	
Mason	12	19	21	13	17	39	121
Carpenter & joiner	11	17	31	2	7	12	80
Electrical wireman	20	25	18	3	0	1	67
Plumber pipe fitter	21	24	11	6	2	6	70
Painter Decorator	8	16	13	7	7	21	72
Steel fixer	5	7	8	2	0	2	24
Plasterer	1	3	0	0	3	4	11
Welder Fabricator	7	10	9	4	0	2	32
Landscaping	2	1	0	0	0	1	4
Total	87	122	111	37	36	88	**481**

The relatively higher number of masonry and carpentry trainees suggests that these are the primary trades in the sector. The few craftsmen that do not train are from the group with the shortest experience in the sector (2 to 5 years). Training is typically informal skilling and its prevalence is a reflection of the availability of new entrants in the sector, particularly primary school graduates, coupled with the absence of any barriers to entry into the informal sector training market. In addition, the prevalence of training highlights the important role of the informal sector in skills development amongst Kenyan craftsmen and suggests that the collapse of formal training was not due to the non-availability of recruits.

Informal craftsmen are not compensated for their training duties. This notwithstanding, many craftsmen are willingly taking on trainees as it is deemed to be part of the construction tradition (Clarke and Wall, 1998a). In addition, as the trainees gains skill they enhance the output of the instructing craftsman thereby boosting their earnings under the piecework terms of engagement since the trainees' unskilled wage is fixed. The number of trainees indicates those coached by each craftsman throughout his career in construction. The craftsmen had trained a mean of 4 persons hence the group of trainers (481) had on average reproduced their skills fourfold which given the length of time in the industry, gives some indication of the expansion in capacity arising from the growing demand for craftsmen skills in the construction sector.

Understandably, training others is closely related to mastery of the trade as reflected by the experience of the craftsman. Consequently, the number of trainees is directly proportional to the craftsman's experience in the construction sector (Table 5.23). In addition, discussions with the craftsmen indicated that the older more experienced craftsmen had a wider clientele and were therefore rarely out of work. Consequently, they were able to take on more trainees because they could guarantee more continuous training whilst also having a better reputation than the younger craftsmen.

Table 5. 23: Craftsmen experience versus number of trainees

Length of time working in construction * number of trainees Cross tabulation							
Length of time working in construction	How many trainees have you trained so far?						Total
	1 to 2	3 to 4	5 to 6	7 to 8	9 to 10	More than 10	
2 to 5 years	21	9	6	1	0	1	38
More than 5 to 10 years	37	41	32	3	4	11	128
More than 10 to 15 years	20	52	41	22	16	21	172
More than 15 to 20 years	6	13	22	8	10	23	82
More than 20 to 25 years	1	3	4	1	2	11	22
More than 25 years	2	4	6	2	4	21	39
Total	87	122	111	37	36	88	**481**

Sourcing trainees

As expected, and as a consequence to the dominance of the informal skilling, trainees are commonly (99%) sourced from the pool of unskilled labourers as were many of their masters (Figure 5.10). This is further evidence that the craftsmen attempt to replicate their own training experience among their trainees. In addition, the craftsmen asserted that their work was difficult physically and was thus best suited for those who joined voluntarily rather than those who were coerced.

Kinship (5.4%), acquaintances (1%), and employer assignees (1.7%) were not significant factors in the recruitment of trainees. The craftsmen explained that construction craftsmanship, being a blue collar job, has low esteem and prestige thus they did not advertise it as a choice career among their kin or friends. However, some craftsmen recruited their relatives particularly those who had been unemployed for long periods due to poor academic achievement. Similarly, employers were deemed to have low regard for construction craftsmanship therefore they rarely assigned trainees. This suggests that, as in many other countries, construction craftsmanship in Kenya has a poor image attracting mainly those unable to find alternative jobs or those who have failed in the classroom based education systems (ILO, 2001).

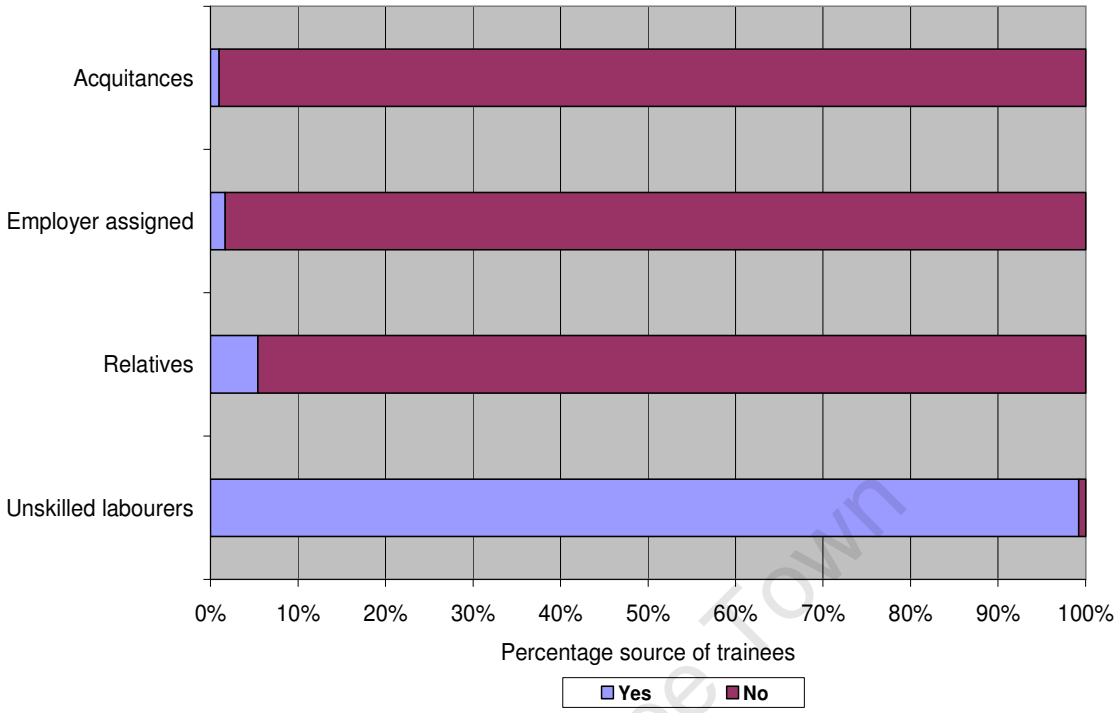


Figure 5. 10: Sources of trainees

The only criterion (96%) used in the selection of trainees was their aptitude (Table 5.24).

Table 5. 24: Criteria for selection of trainees

Criteria used to choose trainees	Frequency	Percent
Ability to pay training fees	1	0.2
Aptitude	480	96.4
Do not train	17	3.4
Total	**498**	**100**

The craftsmen explained that aptitude represents the trainees' inherent ability to learn the respective skills and their ease in using tools (commonly described among the craftsmen as having a talent for a given trade). The measurement of aptitude commences during the initial probation period ranging from approximately one to three months, where the trainee works as a labourer and is required to prove their endurance in the face of taxing physical work; their commitment to work in the sector by reporting on time every day and being obedient. Following probation the trainee learns various skills under the pupilage of the master, mainly by observation

and by performing menial tasks like mixing mortar, cutting various sizes of timber, identifying different material/components, packing, handling (identifying and handing different types of tools to the craftsmen) and carrying tools. As the trainee's knowledge of different materials/tools and their use on the site increases, the difficulty of the allocated tasks increases. The trainee's aptitude is subsequently tested by allowing them to carry out the learned tasks under the master's watchful monitoring. The master then vets the work and if it is up to an acceptable standard the trainees is given increasingly more complex tasks until they are able to work unsupervised. Lack of aptitude may be demonstrated by the trainees' failure in any of the stages and results in one being designated a 'professional' labourer.

Other criteria like ability to pay training fees, level of education, physical fitness and age were insignificant for the selection of trainees. The trainees' level of education was the least important not only because the instructing craftsmen had low levels of education but because the craftsmen claimed that experience had indicated that those with higher levels of education did not demonstrate better/faster mastery of the skills and tended to be less obedient.

Training period

The lack of structure in informal skilling implies that the length of training is not fixed or predetermined. Given that the trainees' aptitude is the overriding attribute, the period of training is mainly determined by the trainee i.e. when the trainee ascertains that he can execute any task assigned by the master successfully, he deems himself qualified and henceforth seeks employment as a craftsman (Table 5.25).

Table 5. 25: Party determining the length of the training period

Party determining the length of the training period	Frequency	Percent	Valid Percent
Master	47	9.4	9.8
Trainee	434	87.1	90.2
Total	**481**	**96.6**	**100**
Do not train	17	3.4	
Total	**498**	**100**	

Alternatively, the master may decide that the trainees is qualified and signal it to him by allocating him work equivalent to that of other craftsmen and negotiating (with the client) a craftsman's pay for the trainee. Where the trainee's workload is upgraded to that of other craftsmen but the pay differs possibly because the employer is unwilling to upgrade his status, the trainee usually opts to leave and seek employment elsewhere as a craftsman.

Table 5. 26: Attribute determining the length of the training period

Attribute determining the length of the training period	Frequency	Percent
Trainees aptitude	480	96.4
Trainees financial ability	1	0.2
Do not train	17	3.4
Total	**498**	**100**

Similarly the length of the training period is not fixed but is determined by the trainee's aptitude (Table 5.26). Consequently, trainees with higher aptitude as indicated by their ability to execute the learned skills after minimal training periods, graduate to craftsmanship the fastest.

Training financing

The majority of the trainees (96%), just as were their masters during training, are hired and paid as unskilled workers during the training period (Table 5.27). Due to the prevalence of the various forms of the piecework format of engagement, many of the trainees (56%), are attached to a particular craftsman who negotiates wages for both hence the master pays the trainee. Accordingly, there is a significant association between the party paying the trainee and the craftsmen's employer and terms of engagement as reflected by the Cramer's V statistic of 0.531 and 0.722 (at $p<0.001$), respectively.

Alternatively, the employer or the lead craftsman may hire both the craftsmen and the labourer-cum-trainee separately (40%) and pay them individually. Effectively therefore all the trainees are paid as unskilled labourers by the client. The few unpaid trainees are those hired by relatives who take care of all their expenses.

Table 5. 27: Payment of the trainees during the training period

Payment of the trainees	Frequency	Percent
Trainee is not paid	4	0.8
The client as unskilled worker	200	40.2
The master as unskilled worker	277	55.6
Do not train	17	3.4
Total	**498**	**100**

As in formal training therefore, the employers are the training financiers (DIT, 2008c). This status is however not explicit as the employer's consent to allow training on their sites is not sought but the tag of unskilled labourers for the trainees allows training to proceed without the former's knowledge or interference. Moreover, the trainees share in the cost of training by accepting low wages during the training.

Preferred training

The craftsmen were unanimous (100%) that the best opportunity for training is offered by new works rather than maintenance/refurbishment jobs. This is because in new works the trainee gets an opportunity to experience the whole variety of tasks involved in his trade as the works progress from foundation to completion. This demonstrates that informally trained craftsman are aware of the benefits of exposing the trainees to all the different types tasks within the chosen trade as recommended by many trainers (Clarke and Wall, 1998b; Syben, 1998).

Table 5.28 indicates that the majority of craftsmen, (97%) acknowledge that the most ideal form of training craftsmen is one that combines classroom and on-the-job instruction.

Table 5. 28: Most appropriate form of training for craftsmen

Best form of training for the craftsmen	Frequency	Percent
Classroom training	1	0.2
On job training under a master	13	2.6
Combination of on-the-job and classroom training	484	97.2
Total	**498**	**100**

This overwhelming choice is indicative of the craftsmen's recognition that some of the skills they require to accomplish their work are best (more satisfactorily and more quickly) disseminated in a classroom environment (Streeck and Hilbert, 1991). They were especially keen to avoid 'trial and error' learning which tended to lower their reputation with clients. These skills are particularly those associated with generic skills that are becoming more important as a consequence of the craftsmen's changing work environment. Moreover, it reflects the craftsmen's appreciation of the increasing need for theoretical knowledge in the contemporary construction sector. Few of the informal craftsmen (3%), advocate exclusive training on-the-job only. The perception of this small group is driven by fear that other choices may bring into question the authenticity of their own skills, which were wholly acquired via on-the-job training.

The craftsmen perceived some skills to be best acquired via classroom (college) training. Figure 5.11 shows that such skills are mainly those that require theoretical input.

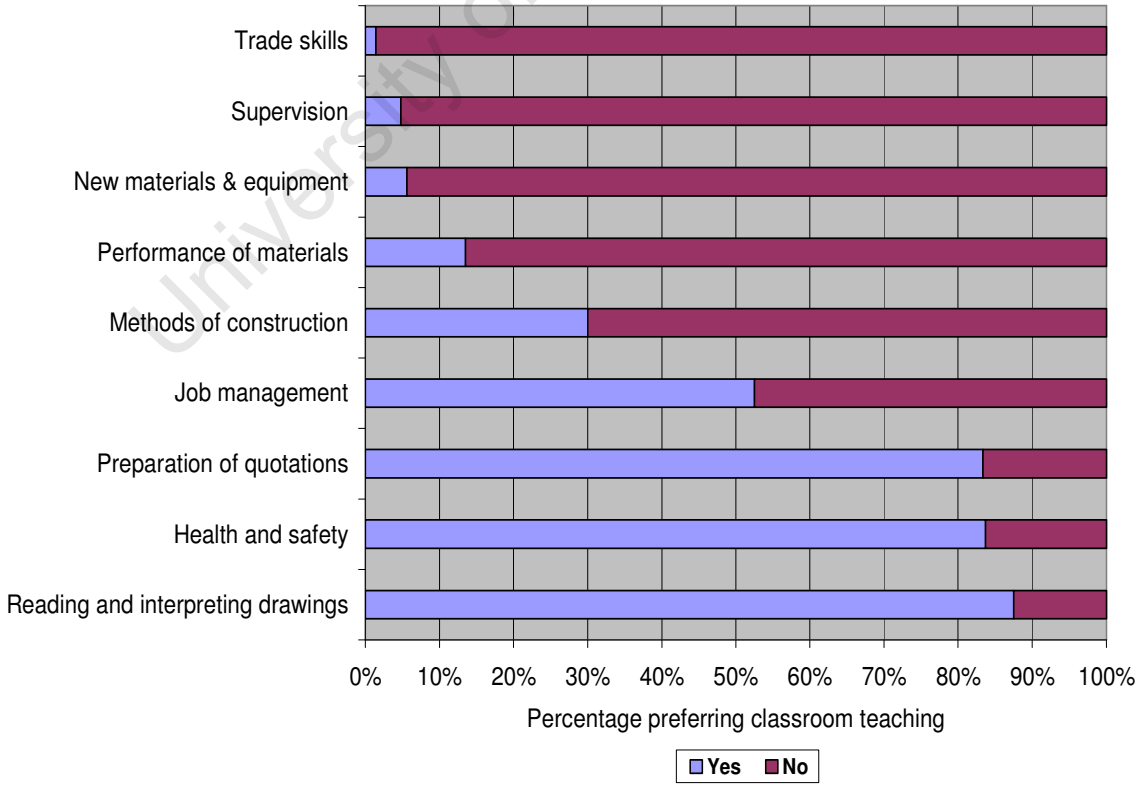


Figure 5. 11: Skill training that requires classroom teaching

The choice of these skills reflects the craftsmen's appreciation of the inadequacy of informal skilling in propagating theoretical training, which they deem necessary (Ziderman, 2003). This may be a proxy of the skill areas that informal craftsmen consider themselves inadequately proficient. This is confirmed by the medium association between the choice of reading and interpreting drawings as best acquired in a classroom and the respondents trade, formal skill upgrading, and acquisition of multiple trade skills (Cramer's V statistic = 0.535, 0.547, and 0.548 at $p<0.001$). Likewise, craftsmen who chose job management as one of the skills they practise deemed it suitable for classroom training as indicated by the medium association between the variables (Cramer's V statistic = 0.612 at $p<0.001$). In keeping with their mode of training, the informal craftsmen generally maintained that trade skills, working with new materials, performance of materials, and supervision are all best learned on-the-job. These are skills that are considered to be best learned via practical experience.

5.4 TRAINING DELIVERY INTERVENTIONS

In this section the study considers the interventions that stakeholders can take to enhance appropriate training among the informally employed craftsmen in Kenya. Such interventions include the enhancement of the role of employee organisation and formulation of suitable modes of training delivery.

Interactions with DIT

The DIT is tasked with training delivery amongst craftsmen in Kenya thus the study sought to find out how successful it was in reaching out to the informal operators. Only 32% of these craftsmen had any interaction with DIT throughout their career (Table 5.29). This indicates that DIT has very low outreach amongst informally employed craftsmen probably due to its focus on formal training coupled with the perceived unsuitability of its programs to informal operators (DIT, 2008c).

Table 5.29 indicates that the informal craftsmen interact with DIT is limited to two areas; trade testing (65%) and skill upgrading (34%). This is further affirmed by the perfect association between interaction with DIT and trade testing as indicated by the Cramer's V statistic of 1.00 (at $p<0.001$). Consequently, a medium association exists between interaction with DIT and type of grade test certificate held, (0.604)

and use of trade test as proof of skill (0.574 both at p<0.001). Likewise, for formal skill upgrading (and consequently institution where course was taken), the statistic is 0.732 (at p<0.001) indicating a highly significant association. Furthermore, there is a medium association between interaction with DIT and mode of recruitment into construction and training (Cramer's V = 0.531 and 0.569 at p<0.001 respectively) indicating that those recruited after formal training are more likely to have interacted with DIT. The negligible (1%) number of informal craftsmen reporting interaction with DIT in trade skills training further confirms the formers exclusion from formal training. Moreover, it highlights the need for DIT to formulate means of reaching the informal sector operators to achieve sector-wide training.

Table 5. 29: Interaction of craftsmen with DIT

Areas of interaction with DIT	Frequency	Percent	Valid Percent
Trade skills training	2	0.4	1.2
Trade skills upgrading	54	10.8	34.2
Trade testing	102	20.5	64.6
Total	**158**	**31.7**	**100**
No interaction	340	68.3	
Total	**498**	**100**	

Employee organisations

In many countries craftsmen representation is crucial to the mounting of successful training programs (Clarke and Wall, 1998b). Given that many of these informally employed craftsmen are not members of the construction trade union for reasons explained in Section 3.2, the study sought to find out if the craftsmen were members of any organisation that could form a common point of contact.

The majority of the craftsmen (52%) were members of informal (*juakali*) organisations (Table 5.30). These informal organisations are not employee associations but are more like welfare clubs where the craftsmen contribute some nominal monies every month to cater for the social needs of the members e.g. hospital bills and funeral expenses. These clubs are not registered, have no specified rules or officials, and no fixed membership as craftsmen tend to join and leave at will. Usually, they revolve around specific, typically older and respected

craftsmen and tend to dissolve when the individual retires, or dies, or migrates from the locality. Being so loosely constituted, these clubs are not recognised by any of the other stakeholders and do not address issues regarding the craftsmen's training, employment, or advancement of their careers or interests. This notwithstanding, the large membership to these clubs indicates that the craftsmen are not averse to forming associations but they might require outside intervention.

Table 5. 30: Craftsmen membership to employee organisations

Membership to employee organisation	Frequency	Percent
Yes	259	52
No	239	48
Total	**498**	**100**

About half (48%) of the craftsmen were not members of any craftsmen organisations (Table 5.30). Discussions with them indicate that being self-employed each craftsman was expected to negotiate individually with the employers and their irregular working practices coupled with the absence of an employer's organisation that would allow collective bargaining minimises any benefits of organisations. This demonstrates the need to formulate a common meeting point for the informal craftsmen and their employers to allow for negotiation on issues of mutual benefit.

Table 5.31 indicates that the majority (98%) of the craftsmen reported that they consider an employee organisation necessary. This is a proxy for both their awareness of the advantages of collective action and their willingness to join such an organisation. Many craftsmen reported that they had not formed an organisation because it would take a lot of their time to set up and run again reflecting the need for external assistance.

Table 5. 31: Craftsmen's perceptions of the need for an employee's organisation

Necessity of an employee's organisation	Frequency	Percent
Yes	489	98.2
No	9	1.8
Total	**498**	**100**

Next the study sought to investigate the duties the craftsmen would expect the employee's organisation to execute relative to training matters. Soliciting for training funding was the most popular (99%) duty (Figure 5.12). The craftsmen explained that they earn minimal wages therefore like in other informal sectors any investment in training would necessarily have to be sourced elsewhere (Whalley and Ziderman, 1990; Middleton *et al.*, 1991). The craftsmen would additionally expect the employee organisation to oversee and coordinate the training programs; maintain a register of qualified craftsmen chiefly for purposes of increasing the availability of work amongst those deemed qualified but not for vetting their training background or their skills; and represent their interests in curriculum development forums so that the course contents would suit their needs and negotiate the lowering of user fees charged in various institutions. These duties are deemed to be better handled by the employee organisation because the craftsmen consider themselves to be inadequately qualified to undertake such responsibilities and none of them could afford to take time off their work to attend to these issues again, affirming the need for outside intervention.

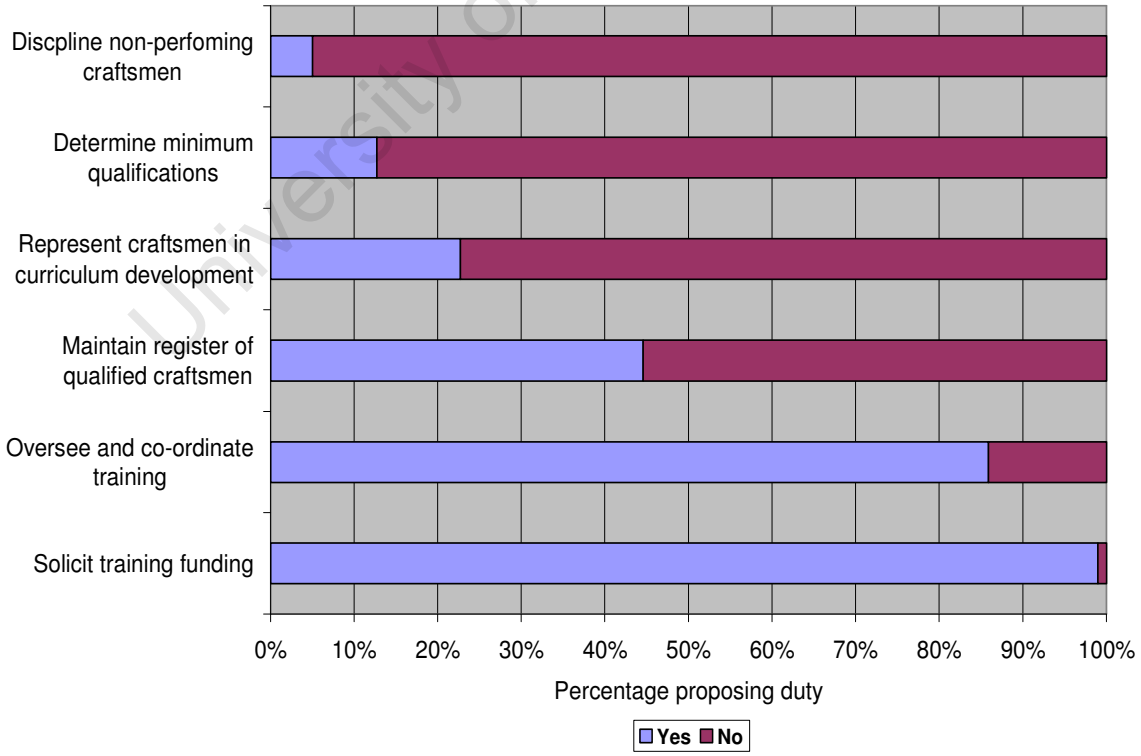


Figure 5. 12: Proposed duties of employee organisation

Informally-employed craftsmen thrive on the lack of regulation of their practice which allows them to use their ingenuity and entrepreneurial skills to succeed. Accordingly, they are opposed to any effort that would introduce regulation into their practices. This is clearly reflected by the minimal support for having the employee organisation determine the minimum qualifications required to enter the market as a craftsman (13%), or to discipline non-performing operators (5%) (Figure 5.12). In addition, there was unanimous opposition to allowing the employee organisation to vet prospective trainees. The craftsmen viewed such activities as attempts to control their practice, compromise their flexibility, intrude in their already established reputations, and possibly create a forum for the government to tax them. Additionally, they were aware that such activities would only succeed if clients agreed to engage only the qualified and registered craftsmen, which is challenging given the diversity of the informal sector clients and the absence of a representative employers' organisation. Beyond the choices provided, the majority (95%) of the craftsmen indicated that they would expect the employee organisations to regulate wages chiefly by guaranteeing minimum wages in addition to giving them affordable loans to buy tools/equipments and to improve their lives e.g. buy houses, and meet their family obligations. This is an indicator of the financial constraints the craftsmen encounter in their career.

Preferred training times, venue and language

Successful training programs must be scheduled at times that are convenient for the target learners. The informal craftsmen were generally unwilling to participate in any form of training that would demand that they sacrifice some of their working time, as this would translate into loss of income. Consequently, many of them preferred that training be scheduled outside the working hours, e.g., weekdays after 5pm, over weekends or on prearranged days (Figure 5.13). Training on weekdays after work was deemed unsuitable because the craftsmen reported that they are extremely fatigued at the end of the day coupled with their tendency to work overtime to meet their piecework tasks. This may partly explain the minimal uptake of DIT skill upgrading courses, which are scheduled on weekdays from 5 to 7pm. Weekends were the most preferred (53%) as the craftsmen would be less fatigued while scheduled days (33%) would allow them to negotiate off-days with their employers. The latter was mainly selected by plumbers and electricians. Training outside the

normal working hours would, however, require that the trainers be willing to sacrifice their free times which would normally coincide with the craftsmen preferred training times or they earn overtime rates. Alternatively, the craftsmen could be compensated for the loss of working time as an incentive to attend such training during the working hours.

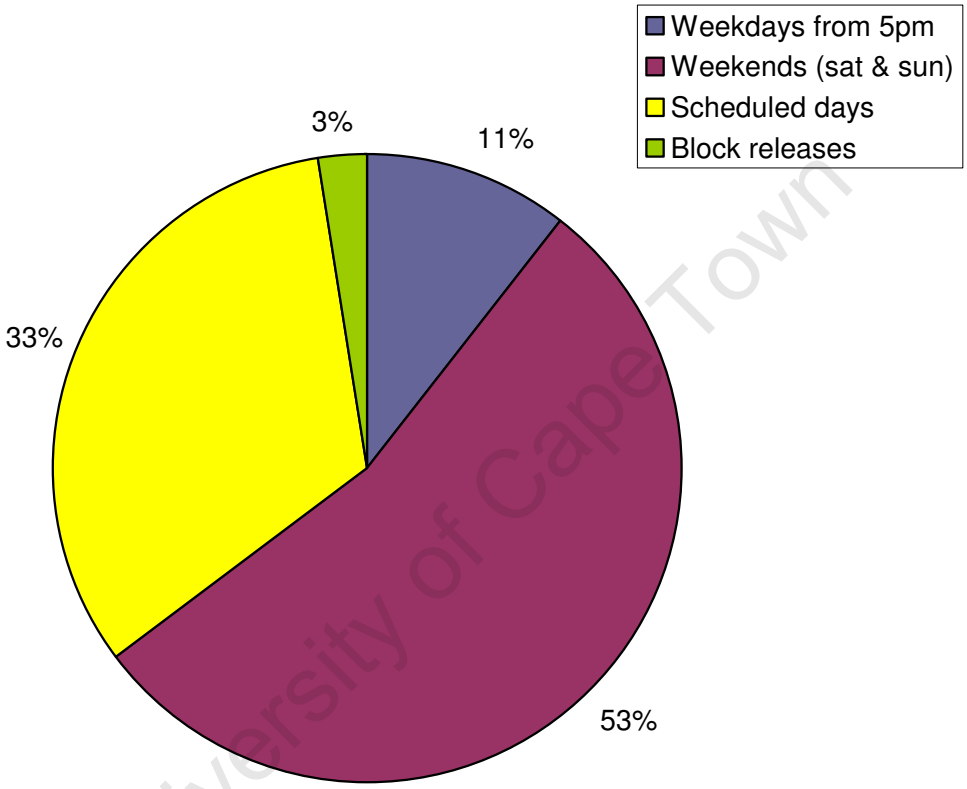


Figure 5. 13: Best time for craftsmen training

In tandem with the preference for training both on-the-job and in classroom as shown in Table 5.28, 90% of the craftsmen chose a combination of the classroom and the site as the most appropriate venue for training (Table 5.32). This is in recognition of the need for theoretical skills that are more suited to classroom training and the need to perfect the acquired skills via hands-on practical experience. Government construction sites were a popular venue selection, particularly for practical training because the craftsmen view such sites as public property on which they should have easy access as opposed to privately owned

sites. Use of government sites would, however, raise other issues like insurance cover for the trainees/trainers and would require negotiation with the contractors.

Table 5. 32: Most suitable venue for craftsmen training

Suitable venue to host craftsmen training courses	Frequency	Percent
Classroom	25	5.0
Government sites	27	5.4
Both classroom and site	446	89.6
Total	**498**	**100**

English is the language of instruction at all the DIT institutions and other formal colleges. The choice of English was deemed appropriate because the target trainees in these institutions are secondary school graduates who are expected to be proficient in the language (DIT, 2008c). Graduates of secondary school in Kenya typically have a total of 12 years of compulsory English language training besides English being the language of instruction in all other subjects except other languages. While English is the formal business language, Kiswahili is the most widely spoken language in Kenya, particularly among those with low levels of formal education and informal sector players.

The majority of informally employed craftsmen (58%) (see Figure 5.3) did not complete their secondary school education hence they are likely to have only a very basic understanding of the English language. Consequently, use of both the English and the Kiswahili language was the most popular choice for the language of training instruction (Table 5.33).

Table 5. 33: Appropriate language of instruction

Appropriate language of instruction	Frequency	Percent
English	10	2.0
Kiswahili	48	9.6
Both English and Kiswahili	440	88.4
Total	**498**	**100**

This was an unexpected result because the relatively low levels of education amongst most of the craftsmen would have suggested that they would prefer the use of the Kiswahili language. However, craftsmen perceived that, while the use of Kiswahili would enhance their understanding of the training/instructions since they were all more proficient in it, they needed familiarity with English which was the main medium of communication with their clients and in the business environment e.g. among material suppliers. Additionally, most of the documents in the construction sector are written in English and where consultants were involved on the sites, English was their language of choice. Consequently, proficiency in English was viewed as a method of enhancing the status of the craftsmen amongst their clients/consultants in addition with improving their interpersonal communication skills. This is demonstrates the need for the training programs to encompass other life skills like reading, writing and numeracy to compensate for the low levels of education among the craftsmen.

5.5 TRAINING INSTITUTIONS

Five training institutions were visited and interviews conducted with the heads of the construction departments. The purpose of the interviews was to solicit the views of these institutions on training of craftsmen in Kenya. Of the five institutions, two were privately owned, two were publicly funded and one was a youth polytechnic.

Skills and skilling

The institutions offer training in the formally recognised crafts including welding and fabrication. Electrical wireman was the most popular craft in all the colleges followed by plumbing. This concurs with the finding that many craftsmen in these trades are college trained (Table 5.9). Painting/decorating training was offered in only one college clarifying the possible reason for the prevalence of informal skilling in this trade (Table 5.9). In addition, trainers in the other colleges explained that painting was taught as part of the masonry, carpentry and metal fabrication crafts rather than as a unique trade. The colleges offered instruction in all the multi-trade skills associated with the respective trades and one college encouraged 'bolted on' multiskilling by combining masonry and plumbing; carpentry and cabinet making to diversify the graduates' employment opportunities. The trainers elaborated that the expense involved in trade multiskilling coupled with the difficulty of trade testing in

multiple trades was prohibitive. The period of training averaged 24 months for all the crafts except at the DIT college where the period was 36 months. This generally agrees with the periods selected by the craftsmen for recognised crafts (Table 5.13), suggesting that this may be the most appropriate training period.

The colleges had similar entry requirements, that is, the applicants be 18 years of age; able to pay fees or have employer sponsorship for the DIT college; and secondary school graduate except for the youth polytechnic and one private college which admitted primary school graduates. Fees in the colleges average KS 10,000 (US$ 161) per term (three terms make one year) making formal training unaffordable for informal craftsmen. Currently the colleges were utilising between 50 and 100% of their training capacity except the DIT college which had no applicants in 2007, further evidence of the declining demand for formal training especially in public colleges.

Accreditation

All the institutions, with the exception of the DIT college reported dissatisfaction with the trade test syllabus. They judged the syllabus as shallow, outdated, and insufficient for contemporary craft needs. The colleges therefore formulated their own curricula, which covers wider skill areas than required by the trade tests e.g. general construction knowledge, working with new material and components, estimation of resources, entrepreneurship, and reading drawings. Moreover, some colleges have adopted the Kenya National Examination Council (KNEC) Technical Education Programme to boost the theoretical content of their courses in addition to affording their trainees extra craft certification (KNEC, 2006). This demonstrates the trainers' appreciation of the value of theoretical knowledge and generic skills in contemporary craftsmanship.

Due to the broadening of their curricula, the colleges reported that their trainees were overqualified for the trade test as exemplified by the 75 to 100% pass rate. In addition, the trainers pointed out the following weakness in the trade testing;

- minimal coverage of emerging trade knowledge e.g. working with new materials;

- English language was a problem for some trainees requiring examiners to translate questions into Kiswahili;
- new trades are not covered e.g. electronics;
- the test sometimes has errors and questions are repeated over the years;
- lack of grading classification does not encourage or recognise excellence; in the current format a trainee can only pass or fail. Trainers suggested the introduction of distinction, credit, pass classifications at all grading levels;
- lack of uniformity in marking;
- absence of an appeals board for those dissatisfied with results;
- inflexibility that does not allow trainees to attempt higher grade tests without starting with the basic trade test; and
- absence of a 'walk in' accreditation shop that would make trade testing more accessible.

The above misgivings suggest that the trade tests have a credibility problem. Interviews with DIT indicate that they are aware of these challenges and they are planning to mount training courses for test developers, increasing the remuneration for examiners to attract more qualified persons, in addition to institution of professional validation of the tests.

Training facilities

All the colleges had workshops and classroom facilities for training. The main challenge for all of them, particularly the youth polytechnic, was the capital outlay involved in equipping and modernising the workshops, tools and purchasing training materials. Many of the trainers explained that the obsolete equipment made their colleges unpopular because they could not keep up with changing technology in addition to the difficulty of maintaining old equipment. To mitigate these costs the colleges combined training and production. Furthermore, they were lobbying the government for grants, subsidies and tax rebates on imported teaching materials. Such assistance was deemed the most appropriate government contribution to training financing.

The colleges recommended an average of one instructor for every 20 students, with most depending on hiring part-time instructors to cope with the fluctuating number of students. To enhance training the trainers suggested the following additional interventions; avail bursaries to assist economically disadvantaged trainees pay fees and purchase tools; introduction of part-time and modularised training to enhance skill upgrading among working craftsmen; the government to assist in the setting up of trainee sites for practical experience; strengthen linkages with contractors to afford more industrial attachment to the trainees; and, involve material manufacturers in the training so that they can donate modern training materials.

Perception of informally trained craftsmen

Trainers in the colleges conceded that informally trained craftsmen outnumbered their graduates in the market and had higher productivity mainly because procedural correctness and safety and health were ignored. However, they pointed out the following weaknesses;

- narrow range of skills;
- lack of exposure to modern materials and technology;
- fewer employment opportunities in government institutions which typically require formal trade certification;
- for electrical work informally trained craftsmen are not allowed to sign official documents certifying the safety of installations;
- poor communication skills; and
- tendency to take undue risk during construction leading to higher incidence of accidents mostly because of ignorance.

To counter these weaknesses the trainers agreed that there is need to formulate courses to upgrades the skills of informal craftsmen.

5.6 EMPLOYERS VIEWS

Five employers were interviewed to corroborate the views from the craftsmen. Four of the employers had engaged craftsmen directly under the informal procurement system while one was a general contractor.

Skill requirements

None of the employers reported much difficulty recruiting craftsmen but all conceded that electrical wiremen were relatively scarce. The employers relied heavily on the lead craftsmen or foreman to find suitably qualified craftsmen as they had better networking amongst the craftsmen. All the informal employers expected the craftsmen to be proficient in their trade skills and in addition possess generic skills like costing, preparation of quotations, material specification and interpretation of drawings. The employers explained that the latter skills were a reflection of the craftsman's experience and in addition the employer economised on costs because the latter was not compensated separately for the skills. This confirms the craftsmen's explanation that they acquired generic skills to meet the requirements of informal employers (Figure 5.7).

Skill certification and training support

Skill proficiency was vetted by testimonials, word of mouth reference, sample work and visits to previous work. The employers asserted that these were preferred modes of skill certification because they reflected experience which is more valuable that trade test certification. This further confirms the declining value of the trade test certificate. Moreover, the employers were satisfied with the work of informally trained craftsmen because they were more readily adaptable to difficult working conditions and required less supervision although they had difficulty adapting to new materials and technology. As expected, none of the employers were aware of any ongoing training on their sites and explained that they would discourage it as it would delay the works by taking up the craftsmen's production time.

None of the informal employers paid or had been asked to pay training levy and only one was aware of the DIT and its functions. This confirms their exclusion from formal training. The formal contractor paid a training levy as it was a requirement in the contract but did not sponsor any trainee or take on any apprentices because his firm preferred to train its own craftsmen on-the-job. In addition, he explained that casual employment was more suited to ungraded craftsmen because it allowed for negotiation of wages. Surprisingly the contractor was a representative of the employers at the DIT further casting doubt on the seriousness of formal training.

5.7 SYNTHESIS

In this section the findings are synthesised to create a model of the training of informally employed craftsmen in the Kenyan construction sector. The model is intended to outline the skills the craftsmen are acquiring, and the skilling routes, hence representing a summary of the study findings. In addition, the model will facilitate the comparison of the informal and formal training system, thereby highlighting any similarities, differences and overlaps of both systems.

Skill profiles

The mapping of skills amongst informally employed craftsmen produced skill profiles that may be divided into four classifications as detailed in Table 5.34. These profiles differ significantly from those in the formal sector as shown in Table 2.2.

Table 5. 34: Kenyan informal craftsmen skill profiles

Kenyan informal craftsmen skill profiles		
A. Lead Craftsman Broadly skilled trade 'Bolted on' specialist trades Broad generic skills Informally trained		
B. Broadly skilled trades	***C. Specialist trades***	***D. Narrow specialisms***
B1. Masonry Masonry Bricklaying Concrete work Fixing metal openings Plastering Tiling Flooring Trade specific generic skills Informally trained	C1. Electrical Wireman Wiring Electrical fittings Trade specific generic skills Formally trained C2. Plumber pipe fitter Piping Sanitary fittings Reservoirs Trade specific generic skills Formally trained	D1. Specialisms Plastering Steel fixing Stone dressing Landscaping* Lack generic skills Informally trained
B2. Carpenter/joiner Carpentry Joinery Timber roofing Timber formwork Timber scaffolding Ceiling finishes Trade specific generic skills Informally trained	C3. Painter decorator Painting/Decoration Sign writing Glazing Trade specific generic skills Informally trained C4. Welder Fabricator Metal work Structural metal Trade specific generic skills Informally trained	

* Landscaping is an emerging trade that is formally trained

Firstly, the informal skill profiles include generic skills in addition to the trade skills. Generic skills are motivated by craftsmen's changing work responsibilities particularly under the informal procurement system. Under this arrangement, the craftsmen are required to assist the client in project execution and to work independently without the supervision of their traditional employer, the contractor. Consequently, they acquire skills that are traditional executed by the contractors and consultants; e.g. material specification, costing, and supervision. Secondly, informal skills are chiefly acquired via informal skilling methods. This reflects the craftsmen's shift towards 'extralegal' modes of skill acquisition. In addition, there is the emergence of new skill categories that are not recognised in the formal sector work environment and training, namely the lead craftsman, and the narrow specialisms. All these changes demonstrate the impact of the increasing informalisation of the construction process, coupled with the dominance of informal procurement systems, on the set of skills required of the contemporary Kenyan craftsmen.

Skilling routes

The summary of the training route of the craftsmen is represented in Figure 5.14 and formal skilling is depicted in Figure 5.15. These conceptual models represent the pathway followed by the different craftsmen enroute to craftsmanship as per the data collected and the specifications by the DIT for the formal route.

The informal training route has a diverse pool of recruits when compared to the formal route, mainly because its entry requirements are relatively more flexible. This makes it a more popular method of training, although it is dominated by 'extralegal' informal skilling that is not formally recognised. In addition, the informal training route recognises a wider range of trade skills and provides for the training in generic skills. It is notable that, although generic skills are not formally recognised, the formally trained craftsmen also acquire them but via informal skilling. The informal and formal craftsmen training routes find commonality in the practical trade training given to the trainees, mainly via on-the-job instruction by a master craftsman. Theoretical trade instruction is only given to the formally trained craftsmen. Moreover, informally trained craftsmen can formalise their skills by attempting and passing the trade test.

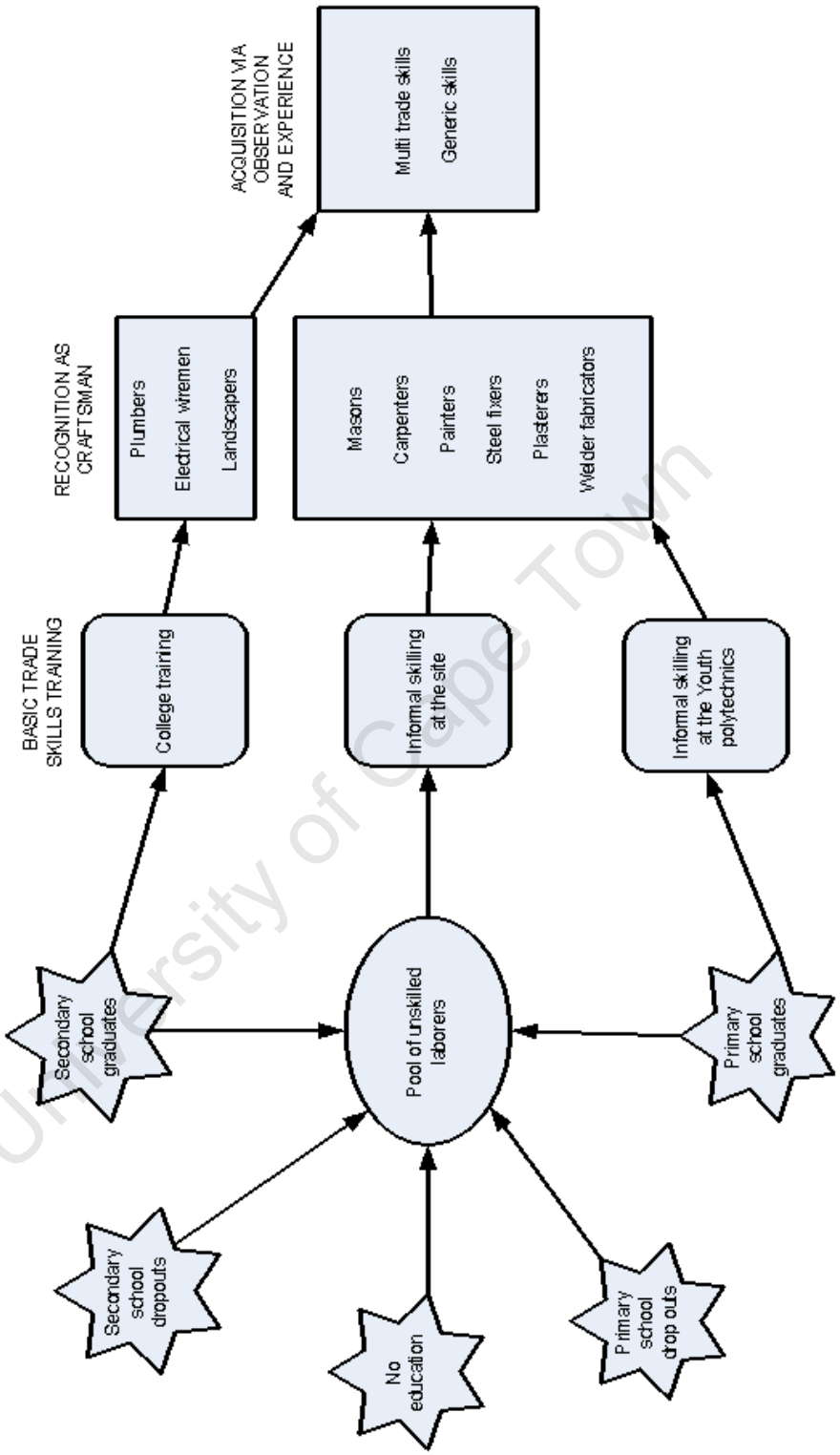


Figure 5. 14: The training route for informal craftsmen

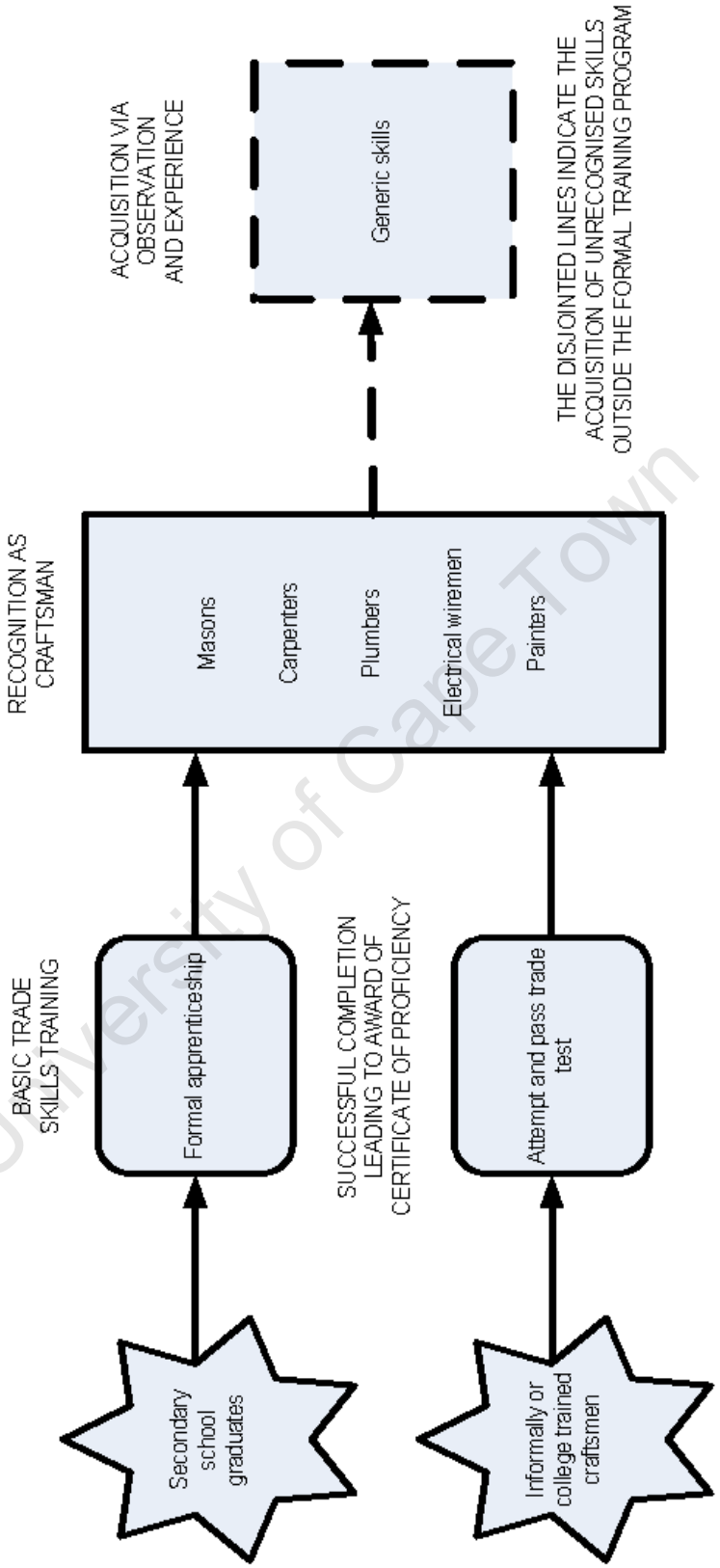


Figure 5. 15: The training route for formally recognised craftsmen

Figure 5.16 summarises the training model for the various trades in the informal sector. The training is a progression commencing with a multi-trade introduction to the site production process when the new entrant is engaged as a labourer; followed by the acquisition of basic trade skills and later on multiple trade skill and generic skills.

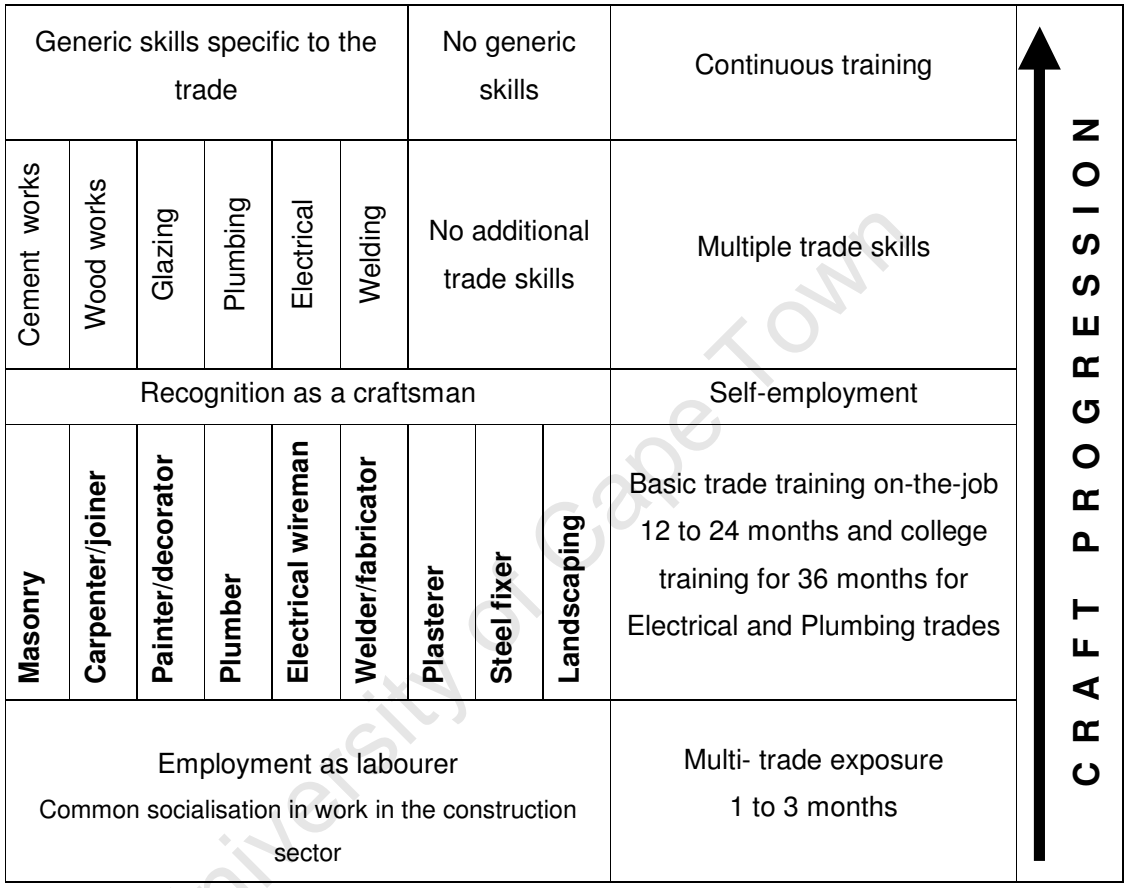


Figure 5. 16: Informal craftsmen training model

As explained in Section 3.1 the formal training model in Kenya is deemed to be a replica of the ideal type 2. Conversely, the format of training followed by the informal craftsmen appears to be a hybrid between ideal types 1 and 2, *albeit* less structured. The probation employment as a labourer exposes the trainee to the various trades and work processes akin to the initial common basic training in ideal type 1. The further specialisation in a particular trade replicates ideal type 2 as it emphasises the attainment of trade specific skills only. Informal training is however unique in that, unlike the two models, it goes beyond the acquisition of trade skills to afford training in generic skills. Although ideal type 1 trainees learn generic skills

e.g. planning and controlling their work, they are limited to the execution of their trade skills whilst those in the informal sector encompass skills traditionally provided by the contractor and consultants e.g. costing and supervision. Informal craft training in Kenya may thus be described as unique and emerging ideal type.

SUMMARY

This empirical study aimed at investigating the skills that informal craftsmen possess, the methods they utilise to acquire these skills, and how appropriate training delivery can be enhanced. Consequently, categorical data were collected from the informal craftsmen via structured questionnaires.

The findings indicate that the majority of craftsmen commenced their career in construction as unskilled labourers and had 10 to 15 years working experience. The modal age of the sample was between 30 and 39 years and 58% had not completed their secondary school education.

The skills mapping indicate that informal craftsmen are acquiring both trade and generic skills. The trade skills follow the formal trade classification but with specialisms in steel fixing, plastering and landscaping. Trade skilling is chiefly via informal skilling methods except for the electrical and plumbing trade that have a higher incidence of formal training. As is typical of informal skilling, the training period for the various trades varies from between 6 to 24 months in addition to 36 months for formally acquired trades. Generic skills such as costing, preparation of quotations, supervision, material specification, interpretation of documents and job management are likewise acquired informally, chiefly via observation and experience. These skills are acquired to meet the demands of the informal sector client who engages the craftsmen directly under piecework terms.

The majority (97%) of the craftsmen propagate their skills by training unskilled labourer via informal skilling. The success of this mode of training is dependent on the trainees' aptitude as indicated by the ease with which they can learn the respective trade. Training financing is shared between the employer who pays the trainees unskilled wages and the trainee who accepts the low wages.

Despite the prevalence of informal skilling, the informal craftsmen consider appropriate craft training to comprise classroom and on-the-job instructing in appreciation that generic skills are more suited to theoretical training. In addition weekend training and instructing via the Kiswahili and English language was deemed to be most suitable. Moreover, many informal craftsmen support the formation of an employee organisation to act both as a contact point and to enhance collective bargaining.

These findings demonstrate the significant role the informal sector is playing in skills development amongst construction craftsmen. Formulation of appropriate sector-wide training policies would thus require engagement of these 'extra-legal' forms of training. Such policy initiatives would entail encompassing the skill needs of the informal sector and taking cognisance of the informal skilling methods in the formulation of viable training programs for construction craftsmen. Moreover, interventions should include building linkages between the formal training institutions and informal trainers in an effort to address the weaknesses of informal skilling e.g. by increasing the level of theoretical instruction and introduction of appropriate technology. The interventions should aim at the integration of both formal and informal craftsmen training as a means of addressing the shortages and inadequacies in craftsmen skills and to increase the levels of skill certification for the benefit of the sector.

In view of the decline of training in the formal construction sector, however any interventions should not be aimed at formalising the informal sector craftsmen but rather at enabling them execute their work responsibilities more efficiently by equipping them with the requisite skills without forgoing the benefits of the existing informal system. This implies that for successful implementation, the informal sector players (clients and craftsmen) should be partners in the formulation of training programs highlighting the need for more representative employer and craftsmen associations. In addition, the DIT, trainers and other stakeholders need to begin viewing the informal construction sector as an important part of the construction sector paving the way for the allocation of resources to address its training requirements.

CHAPTER SIX – CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER WORK

INTRODUCTION

This study set out to investigate the training environment of informally employed craftsmen in the Kenyan construction sector. This entailed the mapping of the skills that these craftsmen are acquiring; exploring the methods of skilling; and identifying the training delivery interventions that maybe used to enhance training. This chapter summarises the findings and presents the conclusions and recommendations of the study.

The chapter is divided into three sections:

- Section *One* revisits the study objectives, summarises the main findings and presents the conclusions. In addition, the implications of the findings on the hypothesis are explained.
- Section *Two* presents the proposed recommendations that may enhance appropriate training amongst informally employed craftsmen.
- Section *Three* outlines the proposed areas of further study emanating form this research.

6.1 CONCLUSIONS

Revisiting the research problem and objectives

The intent of this thesis was to investigate the impact of changes in the Kenyan construction sector on the training of craftsmen. The training and determination of skill requirements amongst craftsmen in the formal Kenyan construction sector is the responsibility of contractors; their recognised employers, under the auspices of the Industrial Training Act Chapter 237. However, over the past 20 years, the Kenyan construction sector has shifted towards increased casualisation of craftsmen engagement consequently eroding the contractors' motivation to train. Concurrently, the sector has experience significant informalisation of the site production process, mainly as a consequence of the informal procurement system,

where self-employed craftsmen are engaged directly by private developers. These private developers, who are currently the largest employers of craftsmen, have no incentive to train because they are *ad hoc* consumers of construction services. In addition, private developers do not contribute to the training levy fund hence they are excluded from the formal training committee and their employees do not benefit from formal training programs. Together, the increased casualisation and self-employment have led to the collapse of the formal system of craft training and made informal employment the most prevalent form of engagement amongst Kenyan craftsmen.

The literature indicates that the skills required of craftsmen change in tandem with changes in their work environment, as a consequence of changing technology, materials, and employment relationships. Accordingly, the changes in the Kenya construction sector, especially with reference to employment relationships, are likely to have altered the landscape of craft skills necessitating a skills mapping exercise. In addition, the collapse of the formal method of craft training, suggested the existence of alternative methods of skilling particularly in view of the rapid growth of the informal construction sector. These alternative modes of skilling are classified as extra-legal or informal skilling. Craft skills mapping and identification of contemporary skilling methods in the Kenyan informal construction sector thus form the core thesis underpinning this study.

Accordingly, the problem statement of this research as set out in Section 1.2 was;

> *Currently, there is a lack of knowledge and understanding of the nature of training taking place in the Kenyan informal construction sector. This gap in knowledge impedes the formulation of meaningful interventions by stakeholders in the delivery of appropriate training to craftsmen.*

To close this existing knowledge gap, the following research questions required to be answered (Section 1.2);

- What skills do clients in the informal construction sector require from craftsmen?

- Do the skills acquired in the informal sector conform to the skill requirements of the formal construction sector?
- How are the craftsmen acquiring these skills in view of the decline in formal training?
- What training delivery methods are appropriate to enhance training in the construction sector given the sector's shift towards casualisation of labour and an increasingly informal procurement system?

From these research questions the research objectives were set as follows (Section 1.2);

- Identify the current skill needs in the Kenyan informal construction sector;
- Investigate the training methods in the Kenyan informal construction sector;
- Explore appropriate methods of training delivery given the sector's shift to casualisation of labour and the informal procurement system.

The above research problem has been validated, the research questions have been answered and the research objectives met as explained in the subsequent sections.

Summary of main findings

The findings presented here represent a substantive increase in the knowledge and understanding concerning the nature of training taking place in the Kenyan informal construction sector thereby facilitating the formulation of meaningful interventions by stakeholders in the delivery of appropriate training to craftsmen hence validating the research problem.

General information

General information contextualises the study findings. Most of the craftsmen, (77%), had between 5 and 20 years experience in the construction sector with a median of 10 to 15 years (34%). This is indicative of the craftsmen's commitment to careers in the sector and is a proxy for their possession of the requisite skills. The majority of the craftsmen, (64%), were in the 30 to 39 years age group, indicating a relatively younger age possibly due to the manual nature of the work that tends to reward physical fitness. Typically, informal craftsmen were recruited into construction as unskilled labourers, (59%), signifying the continuing prevalence of

the Indian style of craft recruitment. This may also be due the low levels of education among these craftsmen; the majority (58%) do not have secondary level education, which precluded them from formal craft training.

Skills mapping

The findings indicate that the majority (89%), of craftsmen chose their own trade guided by their perception of practising craftsmen as they worked as unskilled labourers. Informally employed craftsmen are acquiring two types of skills. Firstly, they are acquiring trade skills that follow the formal trade profiles but with some specialisms. The trade skills include; the broadly skilled trades which are multiskilled and practice a wide range of tasks using specific materials comprising of masonry trade that uses cementacious materials and the carpenter/joiner trade that uses wood materials; the specialist trades which practice tasks within the respective trade but not limited to specific materials comprising of the electrical wireman, plumber pipe fitter, painter/decorator and welder fabricator trades; lastly, are the narrow specialisms comprising of emerging specialities like steel fixing, plastering and landscaping. In addition to these categories, an emerging class of the 'lead' craftsmen who acts as the informal clients' chief advisor was identified. The lead craftsman is primarily from the broadly skilled trades (81% are masons), typically combining both masonry and carpentry trade skills in addition to other 'bolted on skills' like painting. The versatile skills aid the lead craftsman's responsibility of supervising all the site production works and vetting the engagement of other craftsmen.

Secondly, and more significantly, the craftsmen are acquiring generic skills including estimation (92%), preparation of quotations (87%), supervision (79%), material specification (79%), interpretation of documents (69%) and job management (56%). These skills are motivated by the increased informalisation of the site production process, particularly the declining role of the contractor and consultants in the informal procurement system, which is creating a skills gap that the craftsmen are positioning themselves to fill. Consequently, the reasons for acquiring these skills include demands from informal clients (99%), higher pay (82%), and interest in skill (72%). The lead craftsman practices generic skills that cover all the site production works; the broadly skilled and specialist craftsmen practice these skills within the

boundaries of their trade; while the narrow specialisms do not possess this category of skills. Generic skills are not utilised in the formal construction sector or taught in formal training programs because craftsmen are expected to work under the direction of the contractor hence these skills are deemed unnecessary. They therefore represent a new set of skills emanating directly from the informal procurement system. The skills mapping exercise answered the first two research questions.

Skills acquisition

Trade skills amongst informally employed craftsmen are acquired via two methods. The majority of craftsmen (75%), with the exception of electrical wiremen and plumber pipe fitters, acquired their skills mainly via informal skilling. This entails the selection of potential trainees from the pool of unskilled labourers, followed by instruction by experienced craftsmen via observation, on-the-job training and experience. Alternatively, potential craftsmen are informally skilled at the youth polytechnics. Informal training among craftsmen is prevalent because the formal training scheme remains unreachable for most of the entrants either due to their low education (58%); or lack of contractor sponsorship (only 4% work mostly for contractors); coupled with the low utility of formal skill certification by employers, as only 32% have been denied work due to lack of formal skill certification. In addition, the trade specialisms of steel fixing and plastering are wholly acquired informally because they are not recognised as trades and hence they do not attract any formal training. In tandem with the minimal skill upgrading in informal training, 80% of the craftsmen have no formal skill upgrading and only 57% posses' trade certification. Accordingly, in the absence of formal trade certification, clients have devised alternative forms of skill assessment. These include testimonials (58%), word of mouth references (54%), sample work (47%), and visits to previous work (46%).

The period of informal training varies between 6 and 24 months unlike in formal training where it is fixed at 36 months for all trades. Variations depend on the trade with broad trades and landscaping requiring an average of 24 months; steel fixing and welding/fabrication 12 months; and painting and plastering 6 months. These variations between trades, coupled with the homogeneity experienced within trades,

suggest the emergence of norms in the craft market that acknowledge that the difficulty in acquiring craft skills varies between trades.

Electrical wiremen and plumber pipe fitters are mostly trained in public and private formal colleges (68% and 59% respectively). The higher theoretical input, especially in mathematics and science in these trades, coupled with regulations requiring formal certification of installation before connection of facilities by utility providers, precluded the use of informal skilling which typically lacks theory courses and recognised accreditation. The period of training for these trades is 36 months which is typical in formal skilling programs.

Generic skills are mainly (93%) acquired via informal skilling since they are not taught by the formal colleges. The main method of instruction is chiefly observation and experience that is perfected by trial and error. Generic skills have no specific period of learning as they are dependant on the craftsman's access to diverse types of work and clients. The craftsmen indicated the suitability of these skills to classroom training, highlighting the perceived difficulty of their acquisition when compared to the more practical trade skills (97% favour a combination of classroom training for generic skills and on-the-job training for trade skills).

The majority of craftsmen (97%) train others in the same manner they were trained. Trainees are mainly sourced from the ranks of the unskilled labourers (99%) and vetted mainly on their aptitude (96%). Informal training financing is shared between the employer who pays the trainees as an unskilled labourer (96%), and the trainees who accept the low wages (unskilled pay) during the training. This investigation into methods of skill acquisition answered the third research question.

Training delivery

Training delivery interventions are aimed at enhancing appropriate training amongst the craftsmen. One such enhancement would be the existence of an employee organisation that would provide a contact point for the craftsmen. Although many (52%) of the craftsmen do not belong to an employee organisation, they have formed informal welfare clubs to address their social problems. This indicates that they are not averse to joining any such organisation that would enhance collective

action including soliciting training funding (99%) and overseeing the training (86%). External assistance to incorporate and run an employee's organisation would however, be necessary because the craftsmen lack both the skills and the time to accomplish these duties.

Weekend scheduled courses are the most popular (53%) among the craftsmen who can not afford to loose any working time in addition to being less fatigued. In addition, the preferred language of instruction (88%) was a combination of both English and Kiswahili to enhance both the craftsmen comprehension of the training materials and their interpersonal communication skills. This highlights the need to include life skill courses in the training programs e.g. reading, writing, and numeracy. The identification of training delivery enhancers addressed the final research question.

Implication of findings on hypotheses

The hypotheses for this study states that;

1. '*The skill requirements and methods of training craftsmen in the informal construction sector are not significantly different from those in the formal construction sector'.*
2. *'The nature of training in the informal construction sector is clearly understood'.*

The data collected in this study were categorical in nature, thus it was not possible to test the hypotheses statistically. Notwithstanding this, the findings clearly disapprove both hypotheses. Firstly, the skills mapping indicated that craftsmen in the informal sector are acquiring significantly different skills from those utilised in the formal sector as outlined in the Table 5.34. Whilst the formal sector expects the craftsman to work under the direction of a contractor and hence possess only trade skills, the informal sector is additionally requiring the craftsman to acquire generic skills to fill the skills gap created by informalisation of the construction process. Moreover, the skilling in the informal sector overwhelmingly utilises informal skilling methods and recruits trainees from diverse sources as depicted by Figure 5.14 compared to formal training in Figure 5.15. The study therefore concludes that the skill requirements and the methods of training craftsmen in the informal construction

sector are significantly different from those in the formal sector, hence disapproving the first hypothesis.

Secondly, informally trained craftsmen are not formally recognised and hence they are deemed unskilled. This is clearly demonstrated by the minimal number of informal craftsmen with trade test certification as depicted in Figure 5.5. Moreover, as explained above, the generic skills required by informal craftsmen and informal skilling methods are unacknowledged in the formal sector. Consequently, the construction sector stakeholders (clients, trade union, DIT and trainers) have made no attempt to understand the nature of informal training. The study therefore concludes that the nature of training in the informal construction sector is not clearly understood, thus disapproving the second hypothesis.

Conclusions

The conclusions below are presented in relation with the study objectives and hypothesis described previously.

The skill requirements of the informal construction sector differ from those of the formal sector

This was evidenced by the finding that in addition to the traditional trade skills profiles that comprise of masonry, carpentry/joinery, electrical wireman, plumbing and painter/decorator, the informal sector is affording additional skills. These include welding/fabrication which although formally recognised is not grouped among construction trades; and specialisms like plastering and steel fixing that represent the deskilling of the masonry trade and landscaping which is an emerging trade. Moreover, the informal sector construction practices have created a hitherto unknown skill class of the 'lead craftsman' who, in absence of the general contractor, acts as the chief advisor to inexperienced private sector clients in all matters pertaining to the site production process.

More significantly, informally employed craftsmen are acquiring generic skills, for instance, estimation, material specifications, supervision, interpretation of documents and job management. Acquisition of generic skills is chiefly motivated by the growth of self-employment amongst craftsmen engaged under the informal

procurement system. In the absence of a general contractor and consultants, the informal procurement system is altering the craftsmen's work responsibilities, and consequently their skill base, by requiring that they execute some of duties that are traditionally in the domain of the former parties. This conclusion addresses the first objective and disapproves the hypothesis.

Informal skilling methods dominate the informal construction sector

This was indicated by the prevalence of 'extra-legal' forms of skilling, such as, informal apprenticeships with masters including Indian and African contractors; training in the village/youth polytechnics; and learning by experience and observation. Informal skilling is utilised for the acquisition of both trade and generic skills. It is popular amongst craftsmen that do not qualify for formal training programs as a consequence of their low levels of education, lack of contractor sponsorship to join formal training, and for the acquisition of skills that are not formally recognised, for example, generic skills, and trade specialisms. Moreover, informal skilling dominates the training of new entrants where aptitude is the overarching selection criterion. The training for the electrical and plumbing trade is however an exception as both are dominated by formal skilling. This highlights the possible difficulty of acquiring trade skills that require higher theoretical inputs, coupled with proficiency in science and mathematics via informal skilling. This conclusion addresses the second objective and additionally disapproves the hypothesis.

Training delivery can be enhanced by scheduling weekend courses, instructing in both English and Kiswahili and formation of employee organisation

This was attested by the craftsmen's preference of weekend (Saturday and Sunday) training so as to ensure they do not forgo their earnings via skilling during working time coupled with less fatigue on these days. Instruction in English and Kiswahili was deemed most appropriate. The former would enhance the craftsmen's interpersonal communication with other players in the sector, for instance, consultants and clients; while the latter would improve understanding of the course materials as many craftsmen are more proficient in Kiswahili. Both these findings are significant and may *inter alia* explain the low uptake of formal training amongst

these craftsmen because currently all formal training programs are scheduled on weekdays and instruction is in the medium of English language only. In addition, all the craftsmen supported the idea of the formation of an employee organisation and appreciate its potential role in soliciting training funding and overseeing training programs. This conclusion deals with the third objective by highlighting interventions that stakeholders may utilise to encourage appropriate training.

Together the above conclusions imply that the existing system of craftsmen training in Kenya requires a major review. Such a review would entail the expansion of the existing curriculum to cater for emerging knowledge and skill requirements; the acceptance of the Indian style of skilling (informal) as a viable mode of craft training; and the consideration of learners' preferences in the formulation of training programs and materials. Moreover, the conclusions intimate that policies and strategies of enhancing skills development amongst craftsmen would be better served by strengthening the informal training programs converse to the general belief that the sectors skill needs can be met by the reinforcement of formal training institutions.

Although not directly related to the data collected, the study highlights the need to engage the informal employer in the training system. This is not only because the latter is currently the majority employer of craftsmen, but because clearly their practises are impacting the skills required of craftsmen in the sector. Such engagement would ensure that the training programs are more representative of the needs of the market; all craftsmen benefit from training programs irrespective of who they work for; and all employers contribute to the training levy in order to improve training financing. Training financing may for instance be enhanced by attaching the levy to material purchases (e.g. on cement) which are used by all employers, rather than the existing payroll based system which does not capture the informal sector. The training levy would then be used to enhance formal and informal training for the benefit of the whole sector.

6.2 RECOMMENDATIONS

From the conclusions the following recommendations are offered;

- Craft skill profiles in the Kenyan construction sector should be re-examined to take cognisance of the changing work environment and to incorporate the skill requirements of all the employers;
- The training institutions should review the craftsmen training curricula to include the emerging trade specialities and instruction on generic skills. This will make the training more responsive to the market requirements;
- The Industrial Training Act should be amended to recognise Indian format of craft skilling (informal skilling) as a viable method of craftsmen training paving way for the formulation of interventions to redress its weakness. In addition, the act should recognise and engage all craftsmen employers' particularly informal sector employers, in the formulation of training programs. This will ensure that the programs are sustainable and more responsive to the market needs;
- Informal craftsmen should be assisted to incorporate and run sustainable employee organisations which will act as contact points and enhance their collective action; and,
- Craft training courses should preferably be offered on weekends and instruction should be in both English and Kiswahili languages. In addition life skills like reading, writing and numeracy should form part of the training.

6.3 AREAS OF FURTHER STUDY

In order to better understand and enhance the training of informal craftsmen the following are suggested as areas of further investigation;

- Appropriate methods of assessing the informally acquired skills in order to give informal craftsmen portable accreditation;
- Identification of specific interventions to address the weakness of informal skilling as a tool of training craftsmen including the determination of appropriate curricula, entry requirements, and skill certification;
- Establishment of a best practise for skilling of craftsmen in a construction sector that is increasingly casualising employment and informalising the site production process;

- Exploration of sustainable forms of training financing amongst craftsmen working in the informal sector; and,
- Investigation into the formation of sustainable employer and employee organisation in the informal construction sector to enhance collective action.

SUMMARY

This research represents a significant contribution to knowledge and understanding of informal methods of skills development amongst craftsmen in Kenya. It highlights the type of skills that informal craftsmen acquire and the motivation behind such acquisition. In addition, it has enhanced the understanding of 'extra-legal' forms of craft skilling. Given that the informal construction sector is a significant part of the construction industry in many countries particularly in the developing world, and the problems facing the construction sector are mirrored in other countries as indicated in the literature review, the research forms a basis for the enhancement of appropriate and sustainable craft training systems in many countries other than Kenya.

In addition, the findings form a basis for the formulation of policies aimed at the creation of viable training programs for construction craftsmen. Such policy interventions should ideally encourage the building of linkages between the formal training institutions and informal trainers in an effort to address the weaknesses of informal skilling e.g. by increasing the level of theoretical instruction and introduction of appropriate technology. This would allow for the integration of both formal and informal craftsmen training as a means of addressing the shortages and inadequacies in craftsmen skills. In addition, an integrated training program would be more responsive to the needs of the whole sector and also afford an opportunity to create a hybrid characterised by the best of both systems.

Although this research achieved the set objectives it acknowledges that in the process of establishing generalisations the details of personal stories of the individual craftsmen are inevitably lost. Use of the interpretive research approach would have allowed more in-depth analysis of the personal training experiences of the individual craftsmen. Presumably this alternative would have allowed greater

insight into the social structures that support the informal training environment; personal associations/relations that affect training; and identification of individuals that do not conform to the norms. Such information would no doubt enhance the understanding of the nature of informal craft training. Whilst this alternative could not be pursued within the limitations of this study, it highlights a possible future extension.

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Respondent ID# _____ Locality _____

APPENDIX A: QUESTIONNAIRE
TRAINING IN THE KENYAN INFORMAL CONSTRUCTION SECTOR: A SURVEY OF CRAFTSMEN

QUESTIONNAIRE TO CRAFTSMEN

GENERAL INFORMATION

Q-1 How long have you been working in the construction sector? Indicate exact years on the side. **(Circle only one)**

1 Less than 2 years
2 2 to 5 years
3 More than 5 to 10 years
4 More than 10 to 15 years
5 More than 15 to 20 years
6 More than 20 to 25 years
7 More than 25 years

Exact years or year = of commencement ☐

Q-2 How did you start working in the construction industry? **(Circle only one)**

1 As unskilled labourer
2 After college training
3 Recruitment by relative
4 Other please state _____

Q- 3 How old are you? Indicate exact age on the side. **(Circle only one)**

1 15 – 19 years
2 20 – 29 years
3 30 – 39 years
4 40 – 49 years
5 50 – 59 years
6 Above 60 years

Exact age in years = or year of birth ☐

Q-4 What is the highest level of education you have completed? **(Circle only one)**

1 No formal education
2 Some primary school
3 Completed Primary school
4 Some secondary school
5 Completed Secondary school
6 Some College
7 Completed college
8 Other please state _____

Q-5 Are you in-charge of the site/the lead craftsman/the foreman? **(Circle only one)**

1 Yes
2 No

CRAFTSMEN SKILLS AND SKILLING

Q-6 What would you describe yourself as? **(Circle only one)**

1 Mason
2 Carpenter and joiner
3 Electrical wireman
4 Plumber pipe fitter
5 Painter decorator
6 Other – steel fixer
7 Other – plasterer
8 Other – welder fabricator
9 Other _____

Q-7 Who decided on the trade you were to pursue in construction? **(Circle only one)**

1 Me
2 My family
3 My employer
4 My master
5 Other _____

Q-8 How did you train for this trade? **(Circle all that apply)**

1 DIT training
2 Other college training
3 Village/Youth polytechnic
4 Apprenticeship with European contractor under a master
5 Informal Apprenticeship with Asian contractor under a master
6 Informal Apprenticeship with African contractor under a master
7 Informal Apprenticeship with master
8 Observation on the job
9 Other _____

Q-9 How long did your training last? _____ Months

Q-10 In your opinion, if one was to train now in your trade, how long could it take till they could work on their own? **(Circle only one)**

1 3 months
2 6 months
3 12 months
4 18 months
5 24 months
6 30 months
7 36 months
8 Other _____

Q-11 Have you attended any formal skill upgrading courses in your trade, since your initial training? **(Circle only one)**

1 Yes
2 No

If yes, where did you attend the course? **(Circle all that apply)**

1 DIT training
2 Other college training
3 Village/Youth polytechnic
4 Course run by material manufacturers
5 Other _____

Q-12 Do you have a trade test certificate? **(Circle only one)**

1 Yes
2 No

If yes what grade? **(Circle only one)**

1 Grade 1
2 Grade 2
3 Grade 3

Q-13 Have you ever been turned away from a job due to lack of a trade test certificate? **(Circle only one)**

1 Yes
2 No

If yes, what type of client was involved? **(Circle only one)**

1 Government institution
2 European Contractor
3 Informal client
4 NGO
5 Other _____

Q-14 What other trade skills do you perform? **(Circle all that apply)**

1 Masonry
2 Bricklaying
3 Carpentry and joinery
4 Electrical wireman
5 Plumber pipe fitter
6 Painter decorator
7 Glazier
8 Roofer (metal structure)
9 Roofer (timber structure)
10 Steelfixer (bar bender)
11 Metal worker
12 Concreter
13 Formwork fixer
14 Scafolder
15 Plasterer
16 Floorer
17 Tiler
18 Ceiling fixer
19 Plant operation
20 None
21 Other _____

Q-15 How did you learn these skills? **(Circle all that apply)**

1 DIT training
2 Other college training
3 Village/Youth polytechnic
4 Formal apprenticeship with contractor
5 Informal training with contractors
6 Apprenticeship with master
7 Watching others / Experience
8 Other _____

Q-16 Besides your main trade which of the following tasks do you execute? **(Circle all that apply)**

1 Preparation of quotations
2 Recommendation of type and quality of material
3 Estimation of material, labour and time requirement
4 Identification of machinery requirement
5 Interpretation of drawings and other documents
6 Supervision of works
7 Determination of technology i.e. method of construction
8 Management of the job e.g. ordering materials, hiring workers
9 Entrepreneurial duties e.g. marketing, business management
10 None
11 Other _____

Q-17 How did you learn these other skills? **(Circle all that apply)**

1 DIT training
2 Other college training
3 Village/Youth polytechnic
4 Apprenticeship with contractor
5 Informal training with contractors
6 Apprenticeship with master
7 Watching others / Experience
8 Other _____

Q-18 Why did you learn other trades and/or other skills? **(Circle all that apply)**

1 Higher pay
2 Informal client demands
3 Interest in the trade/skill
4 More continuous employment
5 More challenging work
6 Easier work physically
7 Other _____

Q-19 Who do you mostly work for? **(Circle all that apply)**

1 Contractors
2 Directly for clients
3 Both 1 & 2
4 Directly for companies & NGOs
5 Government institutions
6 Other _____

Q-20 What are your terms of employment in your current or last engagement? **(Circle only one)**

1 Daily
2 Weekly
3 Monthly
4 Contract
5 Permanent
6 Piece work
7 Other _____

Q-21 How do you proof to your clients that you can do the work? **(Circle all that apply)**

1 Testimonials
2 Word of mouth reference
3 Visit to previous works
4 Sample work
5 Trade test certificate
6 Other _____

TRAINING OTHERS

Q-22 Do you train others? **(Circle only one)**

1 Yes
2 No

If yes, how many trainees have you trained so far? (**Circle only one)**

1 None
2 1-2
3 3-4
4 5-6
5 7-8
6 9-10
7 More than 10

Q-23 Where do your trainees come from? **(Circle all that apply)**

1 Employer assigned
2 Relatives
3 Acquaintances
4 Unskilled labourers
5 Other _____

Q-24 What criteria do you use to choose who to train? **(Circle all that apply)**

1 Ability to pay training fees
2 Level of education
3 Physical fitness
4 Age
5 Aptitude
6 Other _____

Q-25 Who determines the length of the training period? **(Circle only one)**

1 Master
2 Trainee
3 Other _____

Q-26 What determines the length of the training period? **(Circle only one)**

1 Trainees aptitude
2 Trainees financial ability
3 Other _____

Q-27 Who pays the trainees? **(Circle only one)**

1 Trainee is not paid
2 The client as unskilled worker
3 The master as unskilled worker
4 Other _____

Q-28 In your opinion, which of the following offers the best training opportunity for a trainee? **(Circle all that apply)**

1 New works site
2 Maintenance job
3 Other _____

Q-29 In your opinion, what is the best form of training for craftsmen? **(Circle only one)**

1 Classroom training
2 On the job training under a master
3 Combination of 1 & 2
4 Other _____

Q-30 In your opinion, which of the following needs classroom training? **(Circle all that apply)**

1 Trade skills
2 Preparation of quotations
3 Reading and interpreting documents
4 Methods of construction
5 Health and safety issues
6 Performance of materials
7 Working with new materials/equipment
8 Job management
9 Supervision
10 Other _____

DELIVERY OF TRAINING

Q-31 Have you ever interacted with DIT? **(Circle only one)**

1 Yes
2 No

If yes, in which of the following areas **(Circle all that apply)**

1 Trade skills training
2 Trade skills upgrading course
3 Trade testing
4 Registration of apprenticeship
5 Other _____

Q-32 Are you a member of any 'Jua Kali' association or the construction trade union? **(Circle only one)**

1 Yes
2 No

If no, do you think that such an organisation is necessary? **(Circle only one)**

1 Yes
2 No

Q-33 In your opinion, what would be the duties of an employee's organisation/union in matters relating to training? **(Circle all that apply)**

1 Solicit funds for training
2 Oversee and co-ordinate training
3 Represent craftsmen in curriculum development committees
4 Determine minimum qualifications
5 Maintain register of qualified craftsmen
6 Discipline non-performing craftsmen
7 Vetting of trainees
8 Other _____

Q-34 In your opinion, which of the following times are best suited for craftsmen training courses? **(Circle only one)**

1 Weekdays from 5pm
2 Weekends (Saturday/Sunday)
3 Scheduled days
4 Block releases
5 Other _____

Q-35 In your opinion, what would be the most suitable venue to host such craftsmen training courses? **(Circle only one)**

1 Classroom
2 Government sites
3 Both 1 & 2
4 Other _____

Q-36 In your opinion, what would be the most appropriate language of instruction? **(Circle only one)**

1 English
2 Kiswahili
3 Both 1 & 2
4 Other _____

Your comments on training of craftsmen will be appreciated.

APPENDIX B: RESULTS OF THE SURVEY OF CRAFTSMEN

In this section the survey results for every question in the questionnaire are presented. The results are categorised by the respondents' trade as per the output obtained from SPSS. These results highlight the similarities and difference in the various trades as discussed in the data analysis.

GENERAL INFORMATION

Q-1 How long have you been working in the construction sector?

Respondents trade		LENGTH OF TIME WORKING IN CONSTRUCTION						
		2 to 5 years	More than 5 to 10 years	More than 10 to 15 years	More than 15 to 20 years	More than 20 to 25 years	More than 25 years	Total
Mason	Count	15	36	33	18	9	15	126
	% within TRADE	11.9%	28.6%	26.2%	14.3%	7.1%	11.9%	100.0%
Carpenter & joiner	Count	13	21	30	13	4	5	86
	% within TRADE	15.1%	24.4%	34.9%	15.1%	4.7%	5.8%	100.0%
Electrical wireman	Count	4	17	36	7	2	2	68
	% within TRADE	5.9%	25.0%	52.9%	10.3%	2.9%	2.9%	100.0%
Plumber pipe fitter	Count	8	23	25	10	2	3	71
	% within TRADE	11.3%	32.4%	35.2%	14.1%	2.8%	4.2%	100.0%
Painter decorator	Count	7	15	25	13	4	9	73
	% within TRADE	9.6%	20.5%	34.2%	17.8%	5.5%	12.3%	100.0%
Steel fixer	Count	1	8	6	8	0	2	25
	% within TRADE	4.0%	32.0%	24.0%	32.0%	.0%	8.0%	100.0%
Plasterer	Count	3	3	1	2	1	3	13
	% within TRADE	23.1%	23.1%	7.7%	15.4%	7.7%	23.1%	100.0%
Welder fabricator	Count	0	7	17	7	1	0	32
	% within TRADE	.0%	21.9%	53.1%	21.9%	3.1%	.0%	100.0%
Landscaper	Count	0	0	0	4	0	0	4
	% within TRADE	.0%	.0%	.0%	100.0%	.0%	.0%	100.0%
Total	Count	51	130	173	82	23	39	**498**
	% within TRADE	10.2%	26.1%	34.7%	16.5%	4.6%	7.8%	**100.0%**

Q-2 How did you start working in the construction industry?

Respondents trade		DID YOU JOIN SECTOR BEFORE OR AFTER TRAINING?		
		Before training	After training	Total
Mason	Count	90	36	126
	% within TRADE	71.4%	28.6%	100.0%
Carpenter & joiner	Count	37	49	86
	% within TRADE	43.0%	57.0%	100.0%
Electrical wireman	Count	17	51	68
	% within TRADE	25.0%	75.0%	100.0%
Plumber pipe fitter	Count	21	50	71
	% within TRADE	29.6%	70.4%	100.0%
Painter decorator	Count	65	8	73
	% within TRADE	89.0%	11.0%	100.0%
Steel fixer	Count	23	2	25
	% within TRADE	92.0%	8.0%	100.0%
Plasterer	Count	10	3	13
	% within TRADE	76.9%	23.1%	100.0%
Welder fabricator	Count	28	4	32
	% within TRADE	87.5%	12.5%	100.0%
Landscaper	Count	3	1	4
	% within TRADE	75.0%	25.0%	100.0%
Total	Count	294	204	**498**
	% within TRADE	59.0%	41.0%	**100.0%**

Q- 3 How old are you?

Respondents trade		AGE IN YEARS					
		20 - 29	30 - 39	40 - 49	50 - 59	Above 60	Total
Mason	Count	14	69	32	9	2	126
	% within TRADE	11.1%	54.8%	25.4%	7.1%	1.6%	100.0%
Carpenter & joiner	Count	13	54	12	6	1	86
	% within TRADE	15.1%	62.8%	14.0%	7.0%	1.2%	100.0%
Electrical wireman	Count	5	46	14	2	1	68
	% within TRADE	7.4%	67.6%	20.6%	2.9%	1.5%	100.0%
Plumber pipe fitter	Count	6	52	11	2	0	71
	% within TRADE	8.5%	73.2%	15.5%	2.8%	.0%	100.0%
Painter decorator	Count	8	45	10	8	2	73
	% within TRADE	11.0%	61.6%	13.7%	11.0%	2.7%	100.0%
Steel fixer	Count	2	17	4	2	0	25
	% within TRADE	8.0%	68.0%	16.0%	8.0%	.0%	100.0%
Plasterer	Count	2	7	4	0	0	13
	% within TRADE	15.4%	53.8%	30.8%	.0%	.0%	100.0%
Welder fabricator	Count	0	26	6	0	0	32
	% within TRADE	.0%	81.2%	18.8%	.0%	.0%	100.0%
Landscaper	Count	0	3	1	0	0	4
	% within TRADE	.0%	75.0%	25.0%	.0%	.0%	100.0%
Total	Count	50	319	94	29	6	**498**
	% within TRADE	10.0%	64.1%	18.9%	5.8%	1.2%	**100.0%**

Q-4 What is the highest level of education you have completed?

Respondents trade		RESPONDENTS HIGHEST LEVEL OF EDUCATION				
		Some primary	Completed primary	Some Secondary	Completed Secondary	Total
Mason	Count	9	61	22	34	126
	% within TRADE	7.1%	48.4%	17.5%	27.0%	100.0%
Carpenter & joiner	Count	4	40	19	23	86
	% within TRADE	4.7%	46.5%	22.1%	26.7%	100.0%
Electrical wireman	Count	2	8	9	49	68
	% within TRADE	2.9%	11.8%	13.2%	72.1%	100.0%
Plumber pipe fitter	Count	1	11	11	48	71
	% within TRADE	1.4%	15.5%	15.5%	67.6%	100.0%
Painter decorator	Count	5	22	25	21	73
	% within TRADE	6.8%	30.1%	34.2%	28.8%	100.0%
Steel fixer	Count	1	4	7	13	25
	% within TRADE	4.0%	16.0%	28.0%	52.0%	100.0%
Plasterer	Count	3	5	3	2	13
	% within TRADE	23.1%	38.5%	23.1%	15.4%	100.0%
Welder fabricator	Count	1	7	10	14	32
	% within TRADE	3.1%	21.9%	31.2%	43.8%	100.0%
Landscaper	Count	0	0	0	4	4
	% within TRADE	.0%	.0%	.0%	100.0%	100.0%
Total	Count	26	158	106	208	**498**
	% within TRADE	5.2%	31.7%	21.3%	41.8%	**100.0%**

Q-5 Are you in-charge of the site/the lead craftsman/the foreman?

Respondents trade		ARE YOU INCHARGE OF THE SITE/THE LEAD CRAFTSMAN/FOREMAN?		
		Yes	No	Total
Mason	Count	68	58	126
	% within TRADE	54.0%	46.0%	100.0%
Carpenter & joiner	Count	14	72	86
	% within TRADE	16.3%	83.7%	100.0%
Electrical wireman	Count	1	67	68
	% within TRADE	1.5%	98.5%	100.0%
Plumber pipe fitter	Count	0	71	71
	% within TRADE	.0%	100.0%	100.0%
Painter decorator	Count	0	73	73
	% within TRADE	.0%	100.0%	100.0%
Steel fixer	Count	0	25	25
	% within TRADE	.0%	100.0%	100.0%
Plasterer	Count	0	13	13
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	0	32	32
	% within TRADE	.0%	100.0%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	83	415	498
	% within TRADE	16.7%	83.3%	100.0%

CRAFTSMEN SKILLS AND SKILLING

Q-6 What would you describe yourself as?

Respondents trade	Frequency	Percent	Valid Percent	Cumulative Percent
Mason	126	25.3	25.3	25.3
Carpenter & joiner	86	17.3	17.3	42.6
Electrical wireman	68	13.7	13.7	56.2
Plumber pipe fitter	71	14.3	14.3	70.5
Painter decorator	73	14.7	14.7	85.1
Steel fixer	25	5.0	5.0	90.2
Plasterer	13	2.6	2.6	92.8
Welder fabricator	32	6.4	6.4	99.2
Landscaper	4	.8	.8	100.0
Total	**498**	**100.0**	**100.0**	

Q-7 Who decided on the trade you were to pursue in construction?

Respondents trade		WHO CHOOSE THE TRADE FOR YOU?				
		ME	MY FAMILY	MY EMPLOYER	MY MASTER	Total
Mason	Count	116	8	0	2	126
	% within TRADE	92.1%	6.3%	.0%	1.6%	100.0%
Carpenter & joiner	Count	77	8	0	1	86
	% within TRADE	89.5%	9.3%	.0%	1.2%	100.0%
Electrical wireman	Count	64	4	0	0	68
	% within TRADE	94.1%	5.9%	.0%	.0%	100.0%
Plumber pipe fitter	Count	63	6	0	2	71
	% within TRADE	88.7%	8.5%	.0%	2.8%	100.0%
Painter decorator	Count	58	10	2	3	73
	% within TRADE	79.5%	13.7%	2.7%	4.1%	100.0%
Steel fixer	Count	22	0	0	3	25
	% within TRADE	88.0%	.0%	.0%	12.0%	100.0%
Plasterer	Count	12	1	0	0	13
	% within TRADE	92.3%	7.7%	.0%	.0%	100.0%
Welder fabricator	Count	27	2	0	3	32
	% within TRADE	84.4%	6.2%	.0%	9.4%	100.0%
Landscaper	Count	2	1	1	0	4
	% within TRADE	50.0%	25.0%	25.0%	.0%	100.0%
Total	Count	441	40	3	14	**498**
	% within TRADE	88.6%	8.0%	.6%	2.8%	**100.0%**

Q-8 How did you train for this trade?

Respondents trade		FORMAL VERSUS INFORMAL SKILLING		
		Formal training	Informal training	Total
Mason	Count	11	115	126
	% within TRADE	8.7%	91.3%	100.0%
Carpenter & joiner	Count	13	73	86
	% within TRADE	15.1%	84.9%	100.0%
Electrical wireman	Count	44	24	68
	% within TRADE	64.7%	35.3%	100.0%
Plumber pipe fitter	Count	42	29	71
	% within TRADE	59.2%	40.8%	100.0%
Painter decorator	Count	2	71	73
	% within TRADE	2.7%	97.3%	100.0%
Steel fixer	Count	0	25	25
	% within TRADE	.0%	100.0%	100.0%
Plasterer	Count	0	13	13
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	3	29	32
	% within TRADE	9.4%	90.6%	100.0%
Landscaper	Count	3	1	4
	% within TRADE	75.0%	25.0%	100.0%
Total	Count	118	380	**498**
	% within TRADE	23.7%	76.3%	**100.0%**

Q-9 How long did your training last?

Respondents trade		HOW LONG DID YOU TRAIN IN MONTHS?								
		3	6	12	18	24	30	36	48	Total
Mason	Count	5	17	29	10	48	2	9	6	126
	% within TRADE	4.0%	13.5%	23.0%	7.9%	38.1%	1.6%	7.1%	4.8%	100.0%
Carpenter & joiner	Count	2	6	17	4	47	2	7	1	86
	% within TRADE	2.3%	7.0%	19.8%	4.7%	54.7%	2.3%	8.1%	1.2%	100.0%
Electrical wireman	Count	1	1	5	4	19	1	35	2	68
	% within TRADE	1.5%	1.5%	7.4%	5.9%	27.9%	1.5%	51.5%	2.9%	100.0%
Plumber pipe fitter	Count	0	2	8	5	15	1	40	0	71
	% within TRADE	.0%	2.8%	11.3%	7.0%	21.1%	1.4%	56.3%	.0%	100.0%
Painter decorator	Count	11	20	24	6	9	1	2	0	73
	% within TRADE	15.1%	27.4%	32.9%	8.2%	12.3%	1.4%	2.7%	.0%	100.0%
Steel fixer	Count	3	7	9	2	4	0	0	0	25
	% within TRADE	12.0%	28.0%	36.0%	8.0%	16.0%	.0%	.0%	.0%	100.0%
Plasterer	Count	1	4	3	1	3	0	1	0	13
	% within TRADE	7.7%	30.8%	23.1%	7.7%	23.1%	.0%	7.7%	.0%	100.0%
Welder fabricator	Count	1	4	12	8	6	0	1	0	32
	% within TRADE	3.1%	12.5%	37.5%	25.0%	18.8%	.0%	3.1%	.0%	100.0%
Landscaper	Count	0	0	0	0	2	0	2	0	4
	% within TRADE	.0%	.0%	.0%	.0%	50.0%	.0%	50.0%	.0%	100.0%
Total	Count	24	61	107	40	153	7	97	9	**498**
	% within TRADE	4.8%	12.2%	21.5%	8.0%	30.7%	1.4%	19.5%	1.8%	**100.0%**

Q-10 In your opinion, if one was to train now in your trade, how long could it take till they could work on their own?

Respondents trade		WHAT LENGTH OF TRAINING IS APPROPRIATE FOR YOUR TRADE IN MONTHS?								
		3	6	12	18	24	30	36	48	Total
Mason	Count	8	31	31	4	35	3	12	2	126
	% within TRADE	6.3%	24.6%	24.6%	3.2%	27.8%	2.4%	9.5%	1.6%	100.0%
Carpenter & joiner	Count	3	8	18	5	41	4	7	0	86
	% within TRADE	3.5%	9.3%	20.9%	5.8%	47.7%	4.7%	8.1%	.0%	100.0%
Electrical wireman	Count	0	1	10	3	13	1	40	0	68
	% within TRADE	.0%	1.5%	14.7%	4.4%	19.1%	1.5%	58.8%	.0%	100.0%
Plumber pipe fitter	Count	0	3	8	5	15	0	40	0	71
	% within TRADE	.0%	4.2%	11.3%	7.0%	21.1%	.0%	56.3%	.0%	100.0%
Painter decorator	Count	14	39	10	1	6	0	3	0	73
	% within TRADE	19.2%	53.4%	13.7%	1.4%	8.2%	.0%	4.1%	.0%	100.0%
Steel fixer	Count	1	8	10	1	4	0	1	0	25
	% within TRADE	4.0%	32.0%	40.0%	4.0%	16.0%	.0%	4.0%	.0%	100.0%
Plasterer	Count	1	7	3	1	1	0	0	0	13
	% within TRADE	7.7%	53.8%	23.1%	7.7%	7.7%	.0%	.0%	.0%	100.0%
Welder fabricator	Count	1	5	22	1	3	0	0	0	32
	% within TRADE	3.1%	15.6%	68.8%	3.1%	9.4%	.0%	.0%	.0%	100.0%
Landscaper	Count	0	0	0	0	3	0	1	0	4
	% within TRADE	.0%	.0%	.0%	.0%	75.0%	.0%	25.0%	.0%	100.0%
Total	Count	28	102	112	21	121	8	104	2	**498**
	% within TRADE	5.6%	20.5%	22.5%	4.2%	24.3%	1.6%	20.9%	.4%	**100.0%**

Q-11 Have you attended any formal skill upgrading courses in your trade, since your initial training?

Respondents trade		ANY FORMAL SKILL UPGRADE?		
		Yes	No	Total
Mason	Count	22	104	126
	% within TRADE	17.5%	82.5%	100.0%
Carpenter & joiner	Count	17	69	86
	% within TRADE	19.8%	80.2%	100.0%
Electrical wireman	Count	24	44	68
	% within TRADE	35.3%	64.7%	100.0%
Plumber pipe fitter	Count	17	54	71
	% within TRADE	23.9%	76.1%	100.0%
Painter decorator	Count	14	59	73
	% within TRADE	19.2%	80.8%	100.0%
Steel fixer	Count	2	23	25
	% within TRADE	8.0%	92.0%	100.0%
Plasterer	Count	0	13	13
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	4	28	32
	% within TRADE	12.5%	87.5%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	100	398	**498**
	% within TRADE	20.1%	79.9%	**100.0%**

If yes, where did you attend the course?

Respondents trade		WHERE DID YOU ATTEND THE UPGRADE COURSE?					
		DIT	Other colleges	Village polytechnic	Material manufacturer	NGO	Total
Mason	Count	14	4	3	0	1	22
	% within TRADE	63.6%	18.2%	13.6%	.0%	4.5%	100.0%
Carpenter & joiner	Count	11	2	4	0	0	17
	% within TRADE	64.7%	11.8%	23.5%	.0%	.0%	100.0%
Electrical wireman	Count	21	3	0	0	0	24
	% within TRADE	87.5%	12.5%	.0%	.0%	.0%	100.0%
Plumber pipe fitter	Count	12	5	0	0	0	17
	% within TRADE	70.6%	29.4%	.0%	.0%	.0%	100.0%
Painter decorator	Count	2	0	0	12	0	14
	% within TRADE	14.3%	.0%	.0%	85.7%	.0%	100.0%
Steel fixer	Count	1	0	0	1	0	2
	% within TRADE	50.0%	.0%	.0%	50.0%	.0%	100.0%
Welder fabricator	Count	1	0	2	1	0	4
	% within TRADE	25.0%	.0%	50.0%	25.0%	.0%	100.0%
Total	Count	62	14	9	14	1	**100**
	% within TRADE	62.0%	14.0%	9.0%	14.0%	1.0%	**100.0%**

Q-12 Do you have a trade test certificate?

Respondents trade		DO YOU HAVE A TRADE TEST CERT?		
		Yes	No	Total
Mason	Count	40	86	126
	% within TRADE	31.7%	68.3%	100.0%
Carpenter & joiner	Count	55	31	86
	% within TRADE	64.0%	36.0%	100.0%
Electrical wireman	Count	50	18	68
	% within TRADE	73.5%	26.5%	100.0%
Plumber pipe fitter	Count	51	20	71
	% within TRADE	71.8%	28.2%	100.0%
Painter decorator	Count	8	65	73
	% within TRADE	11.0%	89.0%	100.0%
Steel fixer	Count	1	24	25
	% within TRADE	4.0%	96.0%	100.0%
Plasterer	Count	3	10	13
	% within TRADE	23.1%	76.9%	100.0%
Welder fabricator	Count	7	25	32
	% within TRADE	21.9%	78.1%	100.0%
Landscaper	Count	3*	1	4
	% within TRADE	75.0%	25.0%	100.0%
Total	Count	218	280	**498**
	% within TRADE	43.8%	56.2%	**100.0%**

* Certificate from college

If yes what grade?

Respondents trade		WHAT GRADE?			
		Grade 1	Grade 2	Grade 3	Total
Mason	Count	8	15	17	40
	% within TRADE	20.0%	37.5%	42.5%	100.0%
Carpenter & joiner	Count	2	17	36	55
	% within TRADE	3.6%	30.9%	65.5%	100.0%
Electrical wireman	Count	7	20	23	50
	% within TRADE	14.0%	40.0%	46.0%	100.0%
Plumber pipe fitter	Count	5	16	30	51
	% within TRADE	9.8%	31.4%	58.8%	100.0%
Painter decorator	Count	1	0	7	8
	% within TRADE	12.5%	.0%	87.5%	100.0%
Steel fixer	Count	0	0	1	1
	% within TRADE	.0%	.0%	100.0%	100.0%
Plasterer	Count	0	1	2	3
	% within TRADE	.0%	33.3%	66.7%	100.0%
Welder fabricator	Count	1	2	4	7
	% within TRADE	14.3%	28.6%	57.1%	100.0%
Landscaper	Count	2	0	1	3
	% within TRADE	66.7%	.0%	33.3%	100.0%
Total	Count	26	71	121	**218**
	% within TRADE	11.9%	32.6%	55.5%	**100.0%**

Q-13 Have you ever been turned away from a job due to lack of a trade test certificate?

Respondents trade		EVER LOST A JOB COZ OF LACK OF TRADE CERT?		
		Yes	No	Total
Mason	Count	37	89	126
	% within TRADE	29.4%	70.6%	100.0%
Carpenter & joiner	Count	21	65	86
	% within TRADE	24.4%	75.6%	100.0%
Electrical wireman	Count	18	50	68
	% within TRADE	26.5%	73.5%	100.0%
Plumber pipe fitter	Count	12	59	71
	% within TRADE	16.9%	83.1%	100.0%
Painter decorator	Count	41	32	73
	% within TRADE	56.2%	43.8%	100.0%
Steel fixer	Count	11	14	25
	% within TRADE	44.0%	56.0%	100.0%
Plasterer	Count	4	9	13
	% within TRADE	30.8%	69.2%	100.0%
Welder fabricator	Count	15	17	32
	% within TRADE	46.9%	53.1%	100.0%
Landscaper	Count	1	3	4
	% within TRADE	25.0%	75.0%	100.0%
Total	Count	160	338	**498**
	% within TRADE	32.1%	67.9%	**100.0%**

If yes, what type of client was involved?

Respondents trade		WHAT TYPE OF CLIENT?				
		Government institution	European Contractor	Direct client	NGO	Total
Mason	Count	19	5	11	2	37
	% within TRADE	51.4%	13.5%	29.7%	5.4%	100.0%
Carpenter & joiner	Count	11	4	6	0	21
	% within TRADE	52.4%	19.0%	28.6%	.0%	100.0%
Electrical wireman	Count	6	3	9	0	18
	% within TRADE	33.3%	16.7%	50.0%	.0%	100.0%
Plumber pipe fitter	Count	5	1	5	1	12
	% within TRADE	41.7%	8.3%	41.7%	8.3%	100.0%
Painter decorator	Count	19	5	15	2	41
	% within TRADE	46.3%	12.2%	36.6%	4.9%	100.0%
Steel fixer	Count	9	1	1	0	11
	% within TRADE	81.8%	9.1%	9.1%	.0%	100.0%
Plasterer	Count	0	4	0	0	4
	% within TRADE	.0%	100.0%	.0%	.0%	100.0%
Welder fabricator	Count	5	1	9	0	15
	% within TRADE	33.3%	6.7%	60.0%	.0%	100.0%
Landscaper	Count	1	0	0	0	1
	% within TRADE	100.0%	.0%	.0%	.0%	100.0%
Total	Count	75	24	56	5	**160**
	% within TRADE	46.9%	15.0%	35.0%	3.1%	**100.0%**

Q-14 What other trade skills do you perform?

Respondents trade		TRADE MULTISKILLS									
		Cement works	Wood works	Electrical works	Plumbing works	Painting/ Glazing	Metal works	Steel fixing	Land-scaping	Finishing	Total
Mason	Count	125	0	0	0	0	0	0	0	1	126
	% within TRADE	99.2%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.8%	100%
Carpenter & joiner	Count	2	84	0	0	0	0	0	0	0	86
	% within TRADE	2.3%	97.7%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100%
Electrical wireman	Count	0	0	66	2	0	0	0	0	0	68
	% within TRADE	.0%	.0%	97.1%	2.9%	.0%	.0%	.0%	.0%	.0%	100%
Plumber pipe fitter	Count	0	2	1	68	0	0	0	0	0	71
	% within TRADE	.0%	2.8%	1.4%	95.8%	.0%	.0%	.0%	.0%	.0%	100%
Painter decorator	Count	1	0	0	0	71	0	0	0	1	73
	% within TRADE	1.4%	.0%	.0%	.0%	97.3%	.0%	.0%	.0%	1.4%	100%
Steel fixer	Count	2	1	0	0	0	2	20	0	0	25
	% within TRADE	8.0%	4.0%	.0%	.0%	.0%	8.0%	80.0%	.0%	.0%	100%
Plasterer	Count	5	0	0	0	0	0	1	0	7	13
	% within TRADE	38.5%	.0%	.0%	.0%	.0%	.0%	7.7%	.0%	53.8%	100%
Welder fabricator	Count	0	0	0	0	0	31	1	0	0	32
	% within TRADE	.0%	.0%	.0%	.0%	.0%	96.9%	3.1%	.0%	.0%	100%
Land-scaper	Count	0	0	0	0	0	0	0	4	0	4
	% within TRADE	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%	.0%	100%
Total	Count	135	87	67	70	71	33	22	4	9	**498**
	% within TRADE	27.1%	17.5%	13.5%	14.1%	14.3%	6.6%	4.4%	.8%	1.8%	**100%**

Q-15 How did you learn these skills?

Respondents trade		MODE OF LEARNING MULTIPLE TRADE SKILLS				
		DIT	Other Colleges	Village/Youth polytechnic	Informal training	Total
Mason	Count	7	5	21	93	126
	% within TRADE	5.6%	4.0%	16.7%	73.8%	100.0%
Carpenter & joiner	Count	5	9	30	42	86
	% within TRADE	5.8%	10.5%	34.9%	48.8%	100.0%
Electrical wireman	Count	5	32	6	19	62
	% within TRADE	8.1%	51.6%	9.7%	30.6%	100.0%
Plumber pipe fitter	Count	3	32	6	26	67
	% within TRADE	4.5%	47.8%	9.0%	38.8%	100.0%
Painter decorator	Count	3	0	1	69	73
	% within TRADE	4.1%	.0%	1.4%	94.5%	100.0%
Steel fixer	Count	1	0	0	4	5
	% within TRADE	20.0%	.0%	.0%	80.0%	100.0%
Plasterer	Count	0	1	1	4	6
	% within TRADE	.0%	16.7%	16.7%	66.7%	100.0%
Welder fabricator	Count	2	2	1	27	32
	% within TRADE	6.2%	6.2%	3.1%	84.4%	100.0%
Landscaper	Count	0	3	0	1	4
	% within TRADE	.0%	75.0%	.0%	25.0%	100.0%
Total	Count	26	84	66	285	**461**
	% within TRADE	5.6%	18.2%	14.3%	61.8%	**100.0%**

Q-16 Besides your main trade which of the following tasks do you execute?

Respondents trade		PREPARATION OF QUOTATIONS		
		Yes	No	Total
Mason	Count	102	24	126
	% within TRADE	81.0%	19.0%	100.0%
Carpenter & joiner	Count	74	12	86
	% within TRADE	86.0%	14.0%	100.0%
Electrical wireman	Count	67	1	68
	% within TRADE	98.5%	1.5%	100.0%
Plumber pipe fitter	Count	66	4	70
	% within TRADE	94.3%	5.7%	100.0%
Painter decorator	Count	64	9	73
	% within TRADE	87.7%	12.3%	100.0%
Steel fixer	Count	21	4	25
	% within TRADE	84.0%	16.0%	100.0%
Plasterer	Count	9	4	13
	% within TRADE	69.2%	30.8%	100.0%
Welder fabricator	Count	29	3	32
	% within TRADE	90.6%	9.4%	100.0%
Landscaper	Count	3	1	4
	% within TRADE	75.0%	25.0%	100.0%
Total	Count	435	62	**497**
	% within TRADE	87.5%	12.5%	**100.0%**

Respondents trade		RECOMMENDATION OF TYPE & QUALITY OF MATERIALS		
		Yes	No	Total
Mason	Count	87	39	126
	% within TRADE	69.0%	31.0%	100.0%
Carpenter & joiner	Count	67	19	86
	% within TRADE	77.9%	22.1%	100.0%
Electrical wireman	Count	60	8	68
	% within TRADE	88.2%	11.8%	100.0%
Plumber pipe fitter	Count	65	5	70
	% within TRADE	92.9%	7.1%	100.0%
Painter decorator	Count	54	19	73
	% within TRADE	74.0%	26.0%	100.0%
Steel fixer	Count	19	6	25
	% within TRADE	76.0%	24.0%	100.0%
Plasterer	Count	9	4	13
	% within TRADE	69.2%	30.8%	100.0%
Welder fabricator	Count	29	3	32
	% within TRADE	90.6%	9.4%	100.0%
Landscaper	Count	2	2	4
	% within TRADE	50.0%	50.0%	100.0%
Total	Count	392	105	**497**
	% within TRADE	78.9%	21.1%	**100.0%**

Respondents trade		ESTIMATION OF MATERIAL/LABOUR/TIME REQUIREMENT		
		Yes	No	Total
Mason	Count	117	9	126
	% within TRADE	92.9%	7.1%	100.0%
Carpenter & joiner	Count	78	8	86
	% within TRADE	90.7%	9.3%	100.0%
Electrical wireman	Count	65	3	68
	% within TRADE	95.6%	4.4%	100.0%
Plumber pipe fitter	Count	68	2	70
	% within TRADE	97.1%	2.9%	100.0%
Painter decorator	Count	65	8	73
	% within TRADE	89.0%	11.0%	100.0%
Steel fixer	Count	23	2	25
	% within TRADE	92.0%	8.0%	100.0%
Plasterer	Count	9	4	13
	% within TRADE	69.2%	30.8%	100.0%
Welder fabricator	Count	31	1	32
	% within TRADE	96.9%	3.1%	100.0%
Landscaper	Count	3	1	4
	% within TRADE	75.0%	25.0%	100.0%
Total	Count	459	38	**497**
	% within TRADE	92.4%	7.6%	**100.0%**

Respondents trade		IDENTIFICATION OF MACHINERY REQUIREMENT		
		Yes	No	Total
Mason	Count	6	120	126
	% within TRADE	4.8%	95.2%	100.0%
Carpenter & joiner	Count	4	82	86
	% within TRADE	4.7%	95.3%	100.0%
Electrical wireman	Count	3	65	68
	% within TRADE	4.4%	95.6%	100.0%
Plumber pipe fitter	Count	1	69	70
	% within TRADE	1.4%	98.6%	100.0%
Painter decorator	Count	2	71	73
	% within TRADE	2.7%	97.3%	100.0%
Steel fixer	Count	0	25	25
	% within TRADE	.0%	100.0%	100.0%
Plasterer	Count	0	13	13
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	3	29	32
	% within TRADE	9.4%	90.6%	100.0%
Landscaper	Count	1	3	4
	% within TRADE	25.0%	75.0%	100.0%
Total	Count	20	477	**497**
	% within TRADE	4.0%	96.0%	**100.0%**

Respondents trade		INTERPRETATION OF DRAWINGS/OTHER DOCUMENTS		
		Yes	No	Total
Mason	Count	91	35	126
	% within TRADE	72.2%	27.8%	100.0%
Carpenter & joiner	Count	63	23	86
	% within TRADE	73.3%	26.7%	100.0%
Electrical wireman	Count	60	8	68
	% within TRADE	88.2%	11.8%	100.0%
Plumber pipe fitter	Count	63	7	70
	% within TRADE	90.0%	10.0%	100.0%
Painter decorator	Count	17	56	73
	% within TRADE	23.3%	76.7%	100.0%
Steel fixer	Count	21	4	25
	% within TRADE	84.0%	16.0%	100.0%
Plasterer	Count	4	9	13
	% within TRADE	30.8%	69.2%	100.0%
Welder fabricator	Count	26	6	32
	% within TRADE	81.2%	18.8%	100.0%
Landscaper	Count	2	2	4
	% within TRADE	50.0%	50.0%	100.0%
Total	Count	347	150	**497**
	% within TRADE	69.8%	30.2%	**100.0%**

Respondents trade		SUPERVISION OF WORKS		
		Yes	No	Total
Mason	Count	105	21	126
	% within TRADE	83.3%	16.7%	100.0%
Carpenter & joiner	Count	64	22	86
	% within TRADE	74.4%	25.6%	100.0%
Electrical wireman	Count	54	14	68
	% within TRADE	79.4%	20.6%	100.0%
Plumber pipe fitter	Count	59	11	70
	% within TRADE	84.3%	15.7%	100.0%
Painter decorator	Count	58	15	73
	% within TRADE	79.5%	20.5%	100.0%
Steel fixer	Count	20	5	25
	% within TRADE	80.0%	20.0%	100.0%
Plasterer	Count	9	4	13
	% within TRADE	69.2%	30.8%	100.0%
Welder fabricator	Count	23	9	32
	% within TRADE	71.9%	28.1%	100.0%
Landscaper	Count	3	1	4
	% within TRADE	75.0%	25.0%	100.0%
Total	Count	395	102	497
	% within TRADE	79.5%	20.5%	100.0%

Respondents trade		DETERMINATION OF METHOD OF WORK		
		Yes	No	Total
Mason	Count	19	107	126
	% within TRADE	15.1%	84.9%	100.0%
Carpenter & joiner	Count	7	79	86
	% within TRADE	8.1%	91.9%	100.0%
Electrical wireman	Count	4	64	68
	% within TRADE	5.9%	94.1%	100.0%
Plumber pipe fitter	Count	6	64	70
	% within TRADE	8.6%	91.4%	100.0%
Painter decorator	Count	1	72	73
	% within TRADE	1.4%	98.6%	100.0%
Steel fixer	Count	1	24	25
	% within TRADE	4.0%	96.0%	100.0%
Plasterer	Count	0	13	13
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	2	30	32
	% within TRADE	6.2%	93.8%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	40	457	**497**
	% within TRADE	8.0%	92.0%	**100.0%**

Respondents trade		JOB MANAGEMENT		
		Yes	No	Total
Mason	Count	48	78	126
	% within TRADE	38.1%	61.9%	100.0%
Carpenter & joiner	Count	50	36	86
	% within TRADE	58.1%	41.9%	100.0%
Electrical wireman	Count	47	21	68
	% within TRADE	69.1%	30.9%	100.0%
Plumber pipe fitter	Count	50	20	70
	% within TRADE	71.4%	28.6%	100.0%
Painter decorator	Count	43	30	73
	% within TRADE	58.9%	41.1%	100.0%
Steel fixer	Count	16	9	25
	% within TRADE	64.0%	36.0%	100.0%
Plasterer	Count	4	9	13
	% within TRADE	30.8%	69.2%	100.0%
Welder fabricator	Count	19	13	32
	% within TRADE	59.4%	40.6%	100.0%
Landscaper	Count	3	1	4
	% within TRADE	75.0%	25.0%	100.0%
Total	Count	280	217	**497**
	% within TRADE	56.3%	43.7%	**100.0%**

Respondents trade		ENTREPRENEURIAL DUTIES		
		Yes	No	Total
Mason	Count	0	126	126
	% within TRADE	.0%	100.0%	100.0%
Carpenter & joiner	Count	0	86	86
	% within TRADE	.0%	100.0%	100.0%
Electrical wireman	Count	1	67	68
	% within TRADE	1.5%	98.5%	100.0%
Plumber pipe fitter	Count	0	70	70
	% within TRADE	.0%	100.0%	100.0%
Painter decorator	Count	0	73	73
	% within TRADE	.0%	100.0%	100.0%
Steel fixer	Count	0	25	25
	% within TRADE	.0%	100.0%	100.0%
Plasterer	Count	0	13	13
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	0	32	32
	% within TRADE	.0%	100.0%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	1	496	**497**
	% within TRADE	.2%	99.8%	**100.0%**

Q-17 How did you learn these other skills?

Respondents trade		MODE OF LEARNING GENERIC SKILLS				
		DIT	Other Colleges	Village/Youth polytechnic	Informal training	Total
Mason	Count	1	0	3	119	123
	% within TRADE	.8%	.0%	2.4%	96.7%	100.0%
Carpenter & joiner	Count	1	0	1	79	81
	% within TRADE	1.2%	.0%	1.2%	97.5%	100.0%
Electrical wireman	Count	0	1	2	65	68
	% within TRADE	.0%	1.5%	2.9%	95.6%	100.0%
Plumber pipe fitter	Count	1	1	0	67	69
	% within TRADE	1.4%	1.4%	.0%	97.1%	100.0%
Painter decorator	Count	0	0	0	71	71
	% within TRADE	.0%	.0%	.0%	100.0%	100.0%
Steel fixer	Count	0	0	0	25	25
	% within TRADE	.0%	.0%	.0%	100.0%	100.0%
Plasterer	Count	0	0	0	11	11
	% within TRADE	.0%	.0%	.0%	100.0%	100.0%
Welder fabricator	Count	0	0	0	32	32
	% within TRADE	.0%	.0%	.0%	100.0%	100.0%
Landscaper	Count	0	1	0	2	3
	% within TRADE	.0%	33.3%	.0%	66.7%	100.0%
Total	Count	3	3	6	471	**483**
	% within TRADE	.6%	.6%	1.2%	97.5%	**100.0%**

Q-18 Why did you learn other trades and/or other skills?

Respondents trade		HIGHER PAY		
		Yes	No	Total
Mason	Count	102	21	123
	% within TRADE	82.9%	17.1%	100.0%
Carpenter & joiner	Count	64	17	81
	% within TRADE	79.0%	21.0%	100.0%
Electrical wireman	Count	56	12	68
	% within TRADE	82.4%	17.6%	100.0%
Plumber pipe fitter	Count	63	6	69
	% within TRADE	91.3%	8.7%	100.0%
Painter decorator	Count	54	17	71
	% within TRADE	76.1%	23.9%	100.0%
Steel fixer	Count	20	5	25
	% within TRADE	80.0%	20.0%	100.0%
Plasterer	Count	3	8	11
	% within TRADE	27.3%	72.7%	100.0%
Welder fabricator	Count	31	1	32
	% within TRADE	96.9%	3.1%	100.0%
Landscaper	Count	3	0	3
	% within TRADE	100.0%	.0%	100.0%
Total	Count	396	87	**483**
	% within TRADE	82.0%	18.0%	**100.0%**

Respondents trade		INFORMAL CLIENT DEMANDS		
		Yes	No	Total
Mason	Count	123	0	123
	% within TRADE	100.0%	.0%	100.0%
Carpenter & joiner	Count	81	0	81
	% within TRADE	100.0%	.0%	100.0%
Electrical wireman	Count	68	0	68
	% within TRADE	100.0%	.0%	100.0%
Plumber pipe fitter	Count	69	0	69
	% within TRADE	100.0%	.0%	100.0%
Painter decorator	Count	71	0	71
	% within TRADE	100.0%	.0%	100.0%
Steel fixer	Count	25	0	25
	% within TRADE	100.0%	.0%	100.0%
Plasterer	Count	11	0	11
	% within TRADE	100.0%	.0%	100.0%
Welder fabricator	Count	32	0	32
	% within TRADE	100.0%	.0%	100.0%
Landscaper	Count	2	1	3
	% within TRADE	66.7%	33.3%	100.0%
Total	Count	482	1	**483**
	% within TRADE	99.8%	.2%	**100.0%**

Respondents trade		INTEREST IN THE TRADE/SKILL		
		Yes	No	Total
Mason	Count	82	41	123
	% within TRADE	66.7%	33.3%	100.0%
Carpenter & joiner	Count	59	22	81
	% within TRADE	72.8%	27.2%	100.0%
Electrical wireman	Count	49	19	68
	% within TRADE	72.1%	27.9%	100.0%
Plumber pipe fitter	Count	58	11	69
	% within TRADE	84.1%	15.9%	100.0%
Painter decorator	Count	46	25	71
	% within TRADE	64.8%	35.2%	100.0%
Steel fixer	Count	19	6	25
	% within TRADE	76.0%	24.0%	100.0%
Plasterer	Count	2	9	11
	% within TRADE	18.2%	81.8%	100.0%
Welder fabricator	Count	29	3	32
	% within TRADE	90.6%	9.4%	100.0%
Landscaper	Count	3	0	3
	% within TRADE	100.0%	.0%	100.0%
Total	Count	347	136	**483**
	% within TRADE	71.8%	28.2%	**100.0%**

Respondents trade		MORE CONTINOUS EMPLOYMENT		
		Yes	No	Total
Mason	Count	48	75	123
	% within TRADE	39.0%	61.0%	100.0%
Carpenter & joiner	Count	16	65	81
	% within TRADE	19.8%	80.2%	100.0%
Electrical wireman	Count	5	63	68
	% within TRADE	7.4%	92.6%	100.0%
Plumber pipe fitter	Count	12	57	69
	% within TRADE	17.4%	82.6%	100.0%
Painter decorator	Count	19	52	71
	% within TRADE	26.8%	73.2%	100.0%
Steel fixer	Count	3	22	25
	% within TRADE	12.0%	88.0%	100.0%
Plasterer	Count	0	11	11
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	4	28	32
	% within TRADE	12.5%	87.5%	100.0%
Landscaper	Count	0	3	3
	% within TRADE	.0%	100.0%	100.0%
Total	Count	107	376	**483**
	% within TRADE	22.2%	77.8%	**100.0%**

Respondents trade		MORE CHALLENGING WORK		
		Yes	No	Total
Mason	Count	2	121	123
	% within TRADE	1.6%	98.4%	100.0%
Carpenter & joiner	Count	1	80	81
	% within TRADE	1.2%	98.8%	100.0%
Electrical wireman	Count	1	67	68
	% within TRADE	1.5%	98.5%	100.0%
Plumber pipe fitter	Count	0	69	69
	% within TRADE	.0%	100.0%	100.0%
Painter decorator	Count	0	71	71
	% within TRADE	.0%	100.0%	100.0%
Steel fixer	Count	0	25	25
	% within TRADE	.0%	100.0%	100.0%
Plasterer	Count	0	11	11
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	2	30	32
	% within TRADE	6.2%	93.8%	100.0%
Landscaper	Count	0	3	3
	% within TRADE	.0%	100.0%	100.0%
Total	Count	6	477	**483**
	% within TRADE	1.2%	98.8%	**100.0%**

Respondents trade		EASIER WORK PHYSICALLY		
		Yes	No	Total
Mason	Count	1	122	123
	% within TRADE	.8%	99.2%	100.0%
Carpenter & joiner	Count	1	80	81
	% within TRADE	1.2%	98.8%	100.0%
Electrical wireman	Count	1	67	68
	% within TRADE	1.5%	98.5%	100.0%
Plumber pipe fitter	Count	2	67	69
	% within TRADE	2.9%	97.1%	100.0%
Painter decorator	Count	1	70	71
	% within TRADE	1.4%	98.6%	100.0%
Steel fixer	Count	0	25	25
	% within TRADE	.0%	100.0%	100.0%
Plasterer	Count	0	11	11
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	1	31	32
	% within TRADE	3.1%	96.9%	100.0%
Landscaper	Count	0	3	3
	% within TRADE	.0%	100.0%	100.0%
Total	Count	7	476	**483**
	% within TRADE	1.4%	98.6%	**100.0%**

Q-19 Who do you mostly work for?

Respondents trade		WHO DO YOU MOSTLY WORK FOR?				
		Contractors	Directly for clients	Both 1 & 2	Government institutions	Total
Mason	Count	3	56	67	0	126
	% within TRADE	2.4%	44.4%	53.2%	.0%	100.0%
Carpenter & joiner	Count	7	21	57	1	86
	% within TRADE	8.1%	24.4%	66.3%	1.2%	100.0%
Electrical wireman	Count	3	13	52	0	68
	% within TRADE	4.4%	19.1%	76.5%	.0%	100.0%
Plumber pipe fitter	Count	3	10	58	0	71
	% within TRADE	4.2%	14.1%	81.7%	.0%	100.0%
Painter decorator	Count	1	25	47	0	73
	% within TRADE	1.4%	34.2%	64.4%	.0%	100.0%
Steel fixer	Count	3	4	18	0	25
	% within TRADE	12.0%	16.0%	72.0%	.0%	100.0%
Plasterer	Count	0	2	11	0	13
	% within TRADE	.0%	15.4%	84.6%	.0%	100.0%
Welder fabricator	Count	0	13	18	1	32
	% within TRADE	.0%	40.6%	56.2%	3.1%	100.0%
Landscaper	Count	0	1	3	0	4
	% within TRADE	.0%	25.0%	75.0%	.0%	100.0%
Total	Count	20	145	331	2	**498**
	% within TRADE	4.0%	29.1%	66.5%	.4%	**100.0%**

Q-20 What are your terms of employment in your current or last engagement?

Respondents trade		TERMS OF EMPLOYMENT IN CURRENT OR LAST ENGAGEMENT?						
		Daily	Weekly	Monthly	Contract	Permanent	Piece work	Total
Mason	Count	21	59	3	10	0	33	126
	% within TRADE	16.7%	46.8%	2.4%	7.9%	.0%	26.2%	100.0%
Carpenter & joiner	Count	9	18	0	23	1	35	86
	% within TRADE	10.5%	20.9%	.0%	26.7%	1.2%	40.7%	100.0%
Electrical wireman	Count	3	0	3	42	0	20	68
	% within TRADE	4.4%	.0%	4.4%	61.8%	.0%	29.4%	100.0%
Plumber pipe fitter	Count	1	5	1	44	0	20	71
	% within TRADE	1.4%	7.0%	1.4%	62.0%	.0%	28.2%	100.0%
Painter decorator	Count	3	9	0	29	0	32	73
	% within TRADE	4.1%	12.3%	.0%	39.7%	.0%	43.8%	100.0%
Steel fixer	Count	2	1	0	3	0	19	25
	% within TRADE	8.0%	4.0%	.0%	12.0%	.0%	76.0%	100.0%
Plasterer	Count	6	1	0	1	0	5	13
	% within TRADE	46.2%	7.7%	.0%	7.7%	.0%	38.5%	100.0%
Welder fabricator	Count	0	0	0	2	1	29	32
	% within TRADE	.0%	.0%	.0%	6.2%	3.1%	90.6%	100.0%
Landscaper	Count	0	0	0	4	0	0	4
	% within TRADE	.0%	.0%	.0%	100.0%	.0%	.0%	100.0%
Total	Count	45	93	7	158	2	193	**498**
	% within TRADE	9.0%	18.7%	1.4%	31.7%	.4%	38.8%	**100.0%**

Q-21 How do you proof to your clients that you can do the work?

Respondents trade		TESTIMONIALS		
		Yes	No	Total
Mason	Count	48	78	126
	% within TRADE	38.1%	61.9%	100.0%
Carpenter & joiner	Count	52	34	86
	% within TRADE	60.5%	39.5%	100.0%
Electrical wireman	Count	47	21	68
	% within TRADE	69.1%	30.9%	100.0%
Plumber pipe fitter	Count	56	15	71
	% within TRADE	78.9%	21.1%	100.0%
Painter decorator	Count	41	32	73
	% within TRADE	56.2%	43.8%	100.0%
Steel fixer	Count	16	9	25
	% within TRADE	64.0%	36.0%	100.0%
Plasterer	Count	2	11	13
	% within TRADE	15.4%	84.6%	100.0%
Welder fabricator	Count	25	7	32
	% within TRADE	78.1%	21.9%	100.0%
Landscaper	Count	3	1	4
	% within TRADE	75.0%	25.0%	100.0%
Total	Count	290	208	**498**
	% within TRADE	58.2%	41.8%	**100.0%**

Respondents trade		WORD OF MOUTH REFERENCE		
		Yes	No	Total
Mason	Count	65	61	126
	% within TRADE	51.6%	48.4%	100.0%
Carpenter & joiner	Count	48	38	86
	% within TRADE	55.8%	44.2%	100.0%
Electrical wireman	Count	49	19	68
	% within TRADE	72.1%	27.9%	100.0%
Plumber pipe fitter	Count	47	24	71
	% within TRADE	66.2%	33.8%	100.0%
Painter decorator	Count	31	42	73
	% within TRADE	42.5%	57.5%	100.0%
Steel fixer	Count	15	10	25
	% within TRADE	60.0%	40.0%	100.0%
Plasterer	Count	5	8	13
	% within TRADE	38.5%	61.5%	100.0%
Welder fabricator	Count	6	26	32
	% within TRADE	18.8%	81.2%	100.0%
Landscaper	Count	1	3	4
	% within TRADE	25.0%	75.0%	100.0%
Total	Count	267	231	**498**
	% within TRADE	53.6%	46.4%	**100.0%**

Respondents trade		VISIT TO PREVIOUS WORKS		
		Yes	No	Total
Mason	Count	79	47	126
	% within TRADE	62.7%	37.3%	100.0%
Carpenter & joiner	Count	33	53	86
	% within TRADE	38.4%	61.6%	100.0%
Electrical wireman	Count	25	43	68
	% within TRADE	36.8%	63.2%	100.0%
Plumber pipe fitter	Count	26	45	71
	% within TRADE	36.6%	63.4%	100.0%
Painter decorator	Count	43	30	73
	% within TRADE	58.9%	41.1%	100.0%
Steel fixer	Count	10	15	25
	% within TRADE	40.0%	60.0%	100.0%
Plasterer	Count	4	9	13
	% within TRADE	30.8%	69.2%	100.0%
Welder fabricator	Count	8	24	32
	% within TRADE	25.0%	75.0%	100.0%
Landscaper	Count	1	3	4
	% within TRADE	25.0%	75.0%	100.0%
Total	Count	229	269	**498**
	% within TRADE	46.0%	54.0%	**100.0%**

Respondents trade		SAMPLE WORK		
		Yes	No	Total
Mason	Count	74	52	126
	% within TRADE	58.7%	41.3%	100.0%
Carpenter & joiner	Count	34	52	86
	% within TRADE	39.5%	60.5%	100.0%
Electrical wireman	Count	10	58	68
	% within TRADE	14.7%	85.3%	100.0%
Plumber pipe fitter	Count	14	57	71
	% within TRADE	19.7%	80.3%	100.0%
Painter decorator	Count	41	32	73
	% within TRADE	56.2%	43.8%	100.0%
Steel fixer	Count	17	8	25
	% within TRADE	68.0%	32.0%	100.0%
Plasterer	Count	13	0	13
	% within TRADE	100.0%	.0%	100.0%
Welder fabricator	Count	27	5	32
	% within TRADE	84.4%	15.6%	100.0%
Landscaper	Count	2	2	4
	% within TRADE	50.0%	50.0%	100.0%
Total	Count	232	266	**498**
	% within TRADE	46.6%	53.4%	**100.0%**

Respondents trade		TRADE TEST CERTIFICATE		
		Yes	No	Total
Mason	Count	36	90	126
	% within TRADE	28.6%	71.4%	100.0%
Carpenter & joiner	Count	44	42	86
	% within TRADE	51.2%	48.8%	100.0%
Electrical wireman	Count	40	28	68
	% within TRADE	58.8%	41.2%	100.0%
Plumber pipe fitter	Count	48	23	71
	% within TRADE	67.6%	32.4%	100.0%
Painter decorator	Count	7	66	73
	% within TRADE	9.6%	90.4%	100.0%
Steel fixer	Count	1	24	25
	% within TRADE	4.0%	96.0%	100.0%
Plasterer	Count	1	12	13
	% within TRADE	7.7%	92.3%	100.0%
Welder fabricator	Count	6	26	32
	% within TRADE	18.8%	81.2%	100.0%
Landscaper	Count	2	2	4
	% within TRADE	50.0%	50.0%	100.0%
Total	Count	185	313	**498**
	% within TRADE	37.1%	62.9%	**100.0%**

TRAINING OTHERS

Q-22 Do you train others?

Respondents trade		DO YOU TRAIN OTHERS?		
		Yes	No	Total
Mason	Count	121	5	126
	% within TRADE	96.0%	4.0%	100.0%
Carpenter & joiner	Count	80	6	86
	% within TRADE	93.0%	7.0%	100.0%
Electrical wireman	Count	67	1	68
	% within TRADE	98.5%	1.5%	100.0%
Plumber pipe fitter	Count	70	1	71
	% within TRADE	98.6%	1.4%	100.0%
Painter decorator	Count	72	1	73
	% within TRADE	98.6%	1.4%	100.0%
Steel fixer	Count	24	1	25
	% within TRADE	96.0%	4.0%	100.0%
Plasterer	Count	11	2	13
	% within TRADE	84.6%	15.4%	100.0%
Welder fabricator	Count	32	0	32
	% within TRADE	100.0%	.0%	100.0%
Landscaper	Count	4	0	4
	% within TRADE	100.0%	.0%	100.0%
Total	Count	481	17	**498**
	% within TRADE	96.6%	3.4%	**100.0%**

If yes, how many trainees have you trained so far?

Respondents trade		HOW MANY TRAINEES HAVE YOU TRAINED SO FAR?						
		1 to 2	3 to 4	5 to 6	7 to 8	9 to 10	More than 10	Total
Mason	Count	12	19	21	13	17	39	121
	% within TRADE	9.9%	15.7%	17.4%	10.7%	14.0%	32.2%	100.0%
Carpenter & joiner	Count	11	17	31	2	7	12	80
	% within TRADE	13.8%	21.2%	38.8%	2.5%	8.8%	15.0%	100.0%
Electrical wireman	Count	20	25	18	3	0	1	67
	% within TRADE	29.9%	37.3%	26.9%	4.5%	.0%	1.5%	100.0%
Plumber pipe fitter	Count	21	24	11	6	2	6	70
	% within TRADE	30.0%	34.3%	15.7%	8.6%	2.9%	8.6%	100.0%
Painter decorator	Count	8	16	13	7	7	21	72
	% within TRADE	11.1%	22.2%	18.1%	9.7%	9.7%	29.2%	100.0%
Steel fixer	Count	5	7	8	2	0	2	24
	% within TRADE	20.8%	29.2%	33.3%	8.3%	.0%	8.3%	100.0%
Plasterer	Count	1	3	0	0	3	4	11
	% within TRADE	9.1%	27.3%	.0%	.0%	27.3%	36.4%	100.0%
Welder fabricator	Count	7	10	9	4	0	2	32
	% within TRADE	21.9%	31.2%	28.1%	12.5%	.0%	6.2%	100.0%
Landscaper	Count	2	1	0	0	0	1	4
	% within TRADE	50.0%	25.0%	.0%	.0%	.0%	25.0%	100.0%
Total	Count	87	122	111	37	36	88	**481**
	% within TRADE	18.1%	25.4%	23.1%	7.7%	7.5%	18.3%	**100.0%**

Q-23 Where do your trainees come from?

Respondents trade		EMPLOYER ASSIGNED		
		Yes	No	Total
Mason	Count	0	121	121
	% within TRADE	.0%	100.0%	100.0%
Carpenter & joiner	Count	2	78	80
	% within TRADE	2.5%	97.5%	100.0%
Electrical wireman	Count	2	65	67
	% within TRADE	3.0%	97.0%	100.0%
Plumber pipe fitter	Count	3	67	70
	% within TRADE	4.3%	95.7%	100.0%
Painter decorator	Count	0	72	72
	% within TRADE	.0%	100.0%	100.0%
Steel fixer	Count	0	24	24
	% within TRADE	.0%	100.0%	100.0%
Plasterer	Count	0	11	11
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	1	31	32
	% within TRADE	3.1%	96.9%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	8	473	**481**
	% within TRADE	1.7%	98.3%	**100.0%**

Respondents trade		RELATIVES		
		Yes	No	Total
Mason	Count	4	117	121
	% within TRADE	3.3%	96.7%	100.0%
Carpenter & joiner	Count	7	73	80
	% within TRADE	8.8%	91.2%	100.0%
Electrical wireman	Count	1	66	67
	% within TRADE	1.5%	98.5%	100.0%
Plumber pipe fitter	Count	4	66	70
	% within TRADE	5.7%	94.3%	100.0%
Painter decorator	Count	2	70	72
	% within TRADE	2.8%	97.2%	100.0%
Steel fixer	Count	3	21	24
	% within TRADE	12.5%	87.5%	100.0%
Plasterer	Count	0	11	11
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	4	28	32
	% within TRADE	12.5%	87.5%	100.0%
Landscaper	Count	1	3	4
	% within TRADE	25.0%	75.0%	100.0%
Total	Count	26	455	**481**
	% within TRADE	5.4%	94.6%	**100.0%**

Respondents trade		ACQUAINTANCES		
		Yes	No	Total
Mason	Count	5	116	121
	% within TRADE	4.1%	95.9%	100.0%
Carpenter & joiner	Count	0	80	80
	% within TRADE	.0%	100.0%	100.0%
Electrical wireman	Count	0	67	67
	% within TRADE	.0%	100.0%	100.0%
Plumber pipe fitter	Count	0	70	70
	% within TRADE	.0%	100.0%	100.0%
Painter decorator	Count	0	72	72
	% within TRADE	.0%	100.0%	100.0%
Steel fixer	Count	0	24	24
	% within TRADE	.0%	100.0%	100.0%
Plasterer	Count	0	11	11
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	0	32	32
	% within TRADE	.0%	100.0%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	5	476	**481**
	% within TRADE	1.0%	99.0%	**100.0%**

Respondents trade		UNSKILLED LABOURERS		
		Yes	No	Total
Mason	Count	121	0	121
	% within TRADE	100.0%	.0%	100.0%
Carpenter & joiner	Count	79	1	80
	% within TRADE	98.8%	1.2%	100.0%
Electrical wireman	Count	66	1	67
	% within TRADE	98.5%	1.5%	100.0%
Plumber pipe fitter	Count	70	0	70
	% within TRADE	100.0%	.0%	100.0%
Painter decorator	Count	72	0	72
	% within TRADE	100.0%	.0%	100.0%
Steel fixer	Count	24	0	24
	% within TRADE	100.0%	.0%	100.0%
Plasterer	Count	11	0	11
	% within TRADE	100.0%	.0%	100.0%
Welder fabricator	Count	30	2	32
	% within TRADE	93.8%	6.2%	100.0%
Landscaper	Count	4	0	4
	% within TRADE	100.0%	.0%	100.0%
Total	Count	477	4	**481**
	% within TRADE	99.2%	.8%	**100.0%**

Q-24 What criteria do you use to choose who to train?

Respondents trade		CRETERIA		
		Ability to pay training fees	Aptitude	Total
Mason	Count	0	121	121
	% within TRADE	.0%	100.0%	100.0%
Carpenter & joiner	Count	0	80	80
	% within TRADE	.0%	100.0%	100.0%
Electrical wireman	Count	0	67	67
	% within TRADE	.0%	100.0%	100.0%
Plumber pipe fitter	Count	0	70	70
	% within TRADE	.0%	100.0%	100.0%
Painter decorator	Count	0	72	72
	% within TRADE	.0%	100.0%	100.0%
Steel fixer	Count	0	24	24
	% within TRADE	.0%	100.0%	100.0%
Plasterer	Count	0	11	11
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	1	31	32
	% within TRADE	3.1%	96.9%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	1	480	**481**
	% within TRADE	.2%	99.8%	**100.0%**

Q-25 Who determines the length of the training period?

Respondents trade		WHO DETERMINES THE TRAINING PERIOD?		
		Master	Trainee	Total
Mason	Count	15	106	121
	% within TRADE	12.4%	87.6%	100.0%
Carpenter & joiner	Count	3	77	80
	% within TRADE	3.8%	96.2%	100.0%
Electrical wireman	Count	7	60	67
	% within TRADE	10.4%	89.6%	100.0%
Plumber pipe fitter	Count	5	65	70
	% within TRADE	7.1%	92.9%	100.0%
Painter decorator	Count	14	58	72
	% within TRADE	19.4%	80.6%	100.0%
Steel fixer	Count	0	24	24
	% within TRADE	.0%	100.0%	100.0%
Plasterer	Count	1	10	11
	% within TRADE	9.1%	90.9%	100.0%
Welder fabricator	Count	1	31	32
	% within TRADE	3.1%	96.9%	100.0%
Landscaper	Count	1	3	4
	% within TRADE	25.0%	75.0%	100.0%
Total	Count	47	434	**481**
	% within TRADE	9.8%	90.2%	**100.0%**

Q-26 What determines the length of the training period?

Respondents trade		WHAT DETERMINES THE TRAINING PERIOD?		
		Trainees aptitude	Trainees financial ability	Total
Mason	Count	121	0	121
	% within TRADE	100.0%	.0%	100.0%
Carpenter & joiner	Count	80	0	80
	% within TRADE	100.0%	.0%	100.0%
Electrical wireman	Count	67	0	67
	% within TRADE	100.0%	.0%	100.0%
Plumber pipe fitter	Count	70	0	70
	% within TRADE	100.0%	.0%	100.0%
Painter decorator	Count	72	0	72
	% within TRADE	100.0%	.0%	100.0%
Steel fixer	Count	24	0	24
	% within TRADE	100.0%	.0%	100.0%
Plasterer	Count	11	0	11
	% within TRADE	100.0%	.0%	100.0%
Welder fabricator	Count	31	1	32
	% within TRADE	96.9%	3.1%	100.0%
Landscaper	Count	4	0	4
	% within TRADE	100.0%	.0%	100.0%
Total	Count	480	1	**481**
	% within TRADE	99.8%	.2%	**100.0%**

Q-27 Who pays the trainees?

Respondents trade		WHO PAYS THE TRAINEES?			
		Trainee is not paid	The client as unskilled worker	The master as unskilled worker	Total
Mason	Count	0	93	28	121
	% within TRADE	.0%	76.9%	23.1%	100.0%
Carpenter & joiner	Count	1	36	43	80
	% within TRADE	1.2%	45.0%	53.8%	100.0%
Electrical wireman	Count	0	16	51	67
	% within TRADE	.0%	23.9%	76.1%	100.0%
Plumber pipe fitter	Count	0	12	58	70
	% within TRADE	.0%	17.1%	82.9%	100.0%
Painter decorator	Count	0	26	46	72
	% within TRADE	.0%	36.1%	63.9%	100.0%
Steel fixer	Count	0	7	17	24
	% within TRADE	.0%	29.2%	70.8%	100.0%
Plasterer	Count	0	9	2	11
	% within TRADE	.0%	81.8%	18.2%	100.0%
Welder fabricator	Count	3	1	28	32
	% within TRADE	9.4%	3.1%	87.5%	100.0%
Landscaper	Count	0	0	4	4
	% within TRADE	.0%	.0%	100.0%	100.0%
Total	Count	4	200	277	**481**
	% within TRADE	.8%	41.6%	57.6%	**100.0%**

Q-28 In your opinion, which of the following offers the best training opportunity for a trainee?

Respondents trade		BEST TRAINING OPPORTUNITY FOR A TRAINEE?		
		New works site	Maintenance job	Total
Mason	Count	123	0	123
	% within TRADE	100.0%	.0%	100.0%
Carpenter & joiner	Count	83	0	83
	% within TRADE	100.0%	.0%	100.0%
Electrical wireman	Count	68	0	68
	% within TRADE	100.0%	.0%	100.0%
Plumber pipe fitter	Count	70	1	71
	% within TRADE	98.6%	1.4%	100.0%
Painter decorator	Count	72	0	72
	% within TRADE	100.0%	.0%	100.0%
Steel fixer	Count	25	0	25
	% within TRADE	100.0%	.0%	100.0%
Plasterer	Count	12	0	12
	% within TRADE	100.0%	.0%	100.0%
Welder fabricator	Count	32	0	32
	% within TRADE	100.0%	.0%	100.0%
Landscaper	Count	4	0	4
	% within TRADE	100.0%	.0%	100.0%
Total	Count	489	1	**490**
	% within TRADE	99.8%	.2%	**100.0%**

Q-29 In your opinion, what is the best form of training for craftsmen?

Respondents trade		BEST FORM OF TRAINING FOR CRAFTMEN			
		Classroom training	On job training under a master	Combination of 1 & 2	Total
Mason	Count	0	4	122	126
	% within TRADE	.0%	3.2%	96.8%	100.0%
Carpenter & joiner	Count	1	2	83	86
	% within TRADE	1.2%	2.3%	96.5%	100.0%
Electrical wireman	Count	0	1	67	68
	% within TRADE	.0%	1.5%	98.5%	100.0%
Plumber pipe fitter	Count	0	1	70	71
	% within TRADE	.0%	1.4%	98.6%	100.0%
Painter decorator	Count	0	2	71	73
	% within TRADE	.0%	2.7%	97.3%	100.0%
Steel fixer	Count	0	0	25	25
	% within TRADE	.0%	.0%	100.0%	100.0%
Plasterer	Count	0	1	12	13
	% within TRADE	.0%	7.7%	92.3%	100.0%
Welder fabricator	Count	0	2	30	32
	% within TRADE	.0%	6.2%	93.8%	100.0%
Landscaper	Count	0	0	4	4
	% within TRADE	.0%	.0%	100.0%	100.0%
Total	Count	1	13	484	498
	% within TRADE	.2%	2.6%	97.2%	100.0%

Q-30 In your opinion, which of the following needs classroom training?

Respondents trade		TRADE SKILLS		
		Yes	No	Total
Mason	Count	2	124	126
	% within TRADE	1.6%	98.4%	100.0%
Carpenter & joiner	Count	2	84	86
	% within TRADE	2.3%	97.7%	100.0%
Electrical wireman	Count	1	67	68
	% within TRADE	1.5%	98.5%	100.0%
Plumber pipe fitter	Count	1	70	71
	% within TRADE	1.4%	98.6%	100.0%
Painter decorator	Count	0	73	73
	% within TRADE	.0%	100.0%	100.0%
Steel fixer	Count	0	25	25
	% within TRADE	.0%	100.0%	100.0%
Plasterer	Count	0	12	12
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	1	31	32
	% within TRADE	3.1%	96.9%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	7	490	**497**
	% within TRADE	1.4%	98.6%	**100.0%**

Respondents trade		PREPARATION OF QUOTATIONS		
		Yes	No	Total
Mason	Count	103	23	126
	% within TRADE	81.7%	18.3%	100.0%
Carpenter & joiner	Count	73	13	86
	% within TRADE	84.9%	15.1%	100.0%
Electrical wireman	Count	55	13	68
	% within TRADE	80.9%	19.1%	100.0%
Plumber pipe fitter	Count	57	14	71
	% within TRADE	80.3%	19.7%	100.0%
Painter decorator	Count	69	4	73
	% within TRADE	94.5%	5.5%	100.0%
Steel fixer	Count	18	7	25
	% within TRADE	72.0%	28.0%	100.0%
Plasterer	Count	9	3	12
	% within TRADE	75.0%	25.0%	100.0%
Welder fabricator	Count	27	5	32
	% within TRADE	84.4%	15.6%	100.0%
Landscaper	Count	3	1	4
	% within TRADE	75.0%	25.0%	100.0%
Total	Count	414	83	**497**
	% within TRADE	83.3%	16.7%	**100.0%**

Respondents trade		READING & INTERPRETING DOCUMENTS		
		Yes	No	Total
Mason	Count	119	7	126
	% within TRADE	94.4%	5.6%	100.0%
Carpenter & joiner	Count	80	6	86
	% within TRADE	93.0%	7.0%	100.0%
Electrical wireman	Count	65	3	68
	% within TRADE	95.6%	4.4%	100.0%
Plumber pipe fitter	Count	70	1	71
	% within TRADE	98.6%	1.4%	100.0%
Painter decorator	Count	33	40	73
	% within TRADE	45.2%	54.8%	100.0%
Steel fixer	Count	24	1	25
	% within TRADE	96.0%	4.0%	100.0%
Plasterer	Count	11	1	12
	% within TRADE	91.7%	8.3%	100.0%
Welder fabricator	Count	29	3	32
	% within TRADE	90.6%	9.4%	100.0%
Landscaper	Count	4	0	4
	% within TRADE	100.0%	.0%	100.0%
Total	Count	435	62	**497**
	% within TRADE	87.5%	12.5%	**100.0%**

Respondents trade		METHODS OF CONSTRUCTION		
		Yes	No	Total
Mason	Count	57	69	126
	% within TRADE	45.2%	54.8%	100.0%
Carpenter & joiner	Count	20	66	86
	% within TRADE	23.3%	76.7%	100.0%
Electrical wireman	Count	18	50	68
	% within TRADE	26.5%	73.5%	100.0%
Plumber pipe fitter	Count	15	56	71
	% within TRADE	21.1%	78.9%	100.0%
Painter decorator	Count	14	59	73
	% within TRADE	19.2%	80.8%	100.0%
Steel fixer	Count	10	15	25
	% within TRADE	40.0%	60.0%	100.0%
Plasterer	Count	8	4	12
	% within TRADE	66.7%	33.3%	100.0%
Welder fabricator	Count	6	26	32
	% within TRADE	18.8%	81.2%	100.0%
Landscaper	Count	1	3	4
	% within TRADE	25.0%	75.0%	100.0%
Total	Count	149	348	**497**
	% within TRADE	30.0%	70.0%	**100.0%**

Respondents trade		HEALTH AND SAFETY		
		Yes	No	Total
Mason	Count	101	25	126
	% within TRADE	80.2%	19.8%	100.0%
Carpenter & joiner	Count	69	17	86
	% within TRADE	80.2%	19.8%	100.0%
Electrical wireman	Count	60	8	68
	% within TRADE	88.2%	11.8%	100.0%
Plumber pipe fitter	Count	55	16	71
	% within TRADE	77.5%	22.5%	100.0%
Painter decorator	Count	68	5	73
	% within TRADE	93.2%	6.8%	100.0%
Steel fixer	Count	23	2	25
	% within TRADE	92.0%	8.0%	100.0%
Plasterer	Count	11	1	12
	% within TRADE	91.7%	8.3%	100.0%
Welder fabricator	Count	26	6	32
	% within TRADE	81.2%	18.8%	100.0%
Landscaper	Count	3	1	4
	% within TRADE	75.0%	25.0%	100.0%
Total	Count	416	81	**497**
	% within TRADE	83.7%	16.3%	**100.0%**

Respondents trade		PERFORMANCE OF MATERIALS		
		Yes	No	Total
Mason	Count	21	105	126
	% within TRADE	16.7%	83.3%	100.0%
Carpenter & joiner	Count	8	78	86
	% within TRADE	9.3%	90.7%	100.0%
Electrical wireman	Count	7	61	68
	% within TRADE	10.3%	89.7%	100.0%
Plumber pipe fitter	Count	7	64	71
	% within TRADE	9.9%	90.1%	100.0%
Painter decorator	Count	14	59	73
	% within TRADE	19.2%	80.8%	100.0%
Steel fixer	Count	4	21	25
	% within TRADE	16.0%	84.0%	100.0%
Plasterer	Count	5	7	12
	% within TRADE	41.7%	58.3%	100.0%
Welder fabricator	Count	1	31	32
	% within TRADE	3.1%	96.9%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	67	430	**497**
	% within TRADE	13.5%	86.5%	**100.0%**

Respondents trade		WORKING WITH NEW MATERIALS/EQUIPMENT		
		Yes	No	Total
Mason	Count	14	112	126
	% within TRADE	11.1%	88.9%	100.0%
Carpenter & joiner	Count	5	81	86
	% within TRADE	5.8%	94.2%	100.0%
Electrical wireman	Count	0	68	68
	% within TRADE	.0%	100.0%	100.0%
Plumber pipe fitter	Count	2	69	71
	% within TRADE	2.8%	97.2%	100.0%
Painter decorator	Count	4	69	73
	% within TRADE	5.5%	94.5%	100.0%
Steel fixer	Count	1	24	25
	% within TRADE	4.0%	96.0%	100.0%
Plasterer	Count	0	12	12
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	2	30	32
	% within TRADE	6.2%	93.8%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	28	469	**497**
	% within TRADE	5.6%	94.4%	**100.0%**

Respondents trade		JOB MANAGEMENT		
		Yes	No	Total
Mason	Count	42	84	126
	% within TRADE	33.3%	66.7%	100.0%
Carpenter & joiner	Count	46	40	86
	% within TRADE	53.5%	46.5%	100.0%
Electrical wireman	Count	41	27	68
	% within TRADE	60.3%	39.7%	100.0%
Plumber pipe fitter	Count	53	18	71
	% within TRADE	74.6%	25.4%	100.0%
Painter decorator	Count	40	33	73
	% within TRADE	54.8%	45.2%	100.0%
Steel fixer	Count	13	12	25
	% within TRADE	52.0%	48.0%	100.0%
Plasterer	Count	4	8	12
	% within TRADE	33.3%	66.7%	100.0%
Welder fabricator	Count	18	14	32
	% within TRADE	56.2%	43.8%	100.0%
Landscaper	Count	3	1	4
	% within TRADE	75.0%	25.0%	100.0%
Total	Count	260	237	**497**
	% within TRADE	52.3%	47.7%	**100.0%**

Respondents trade		SUPERVISION		
		Yes	No	Total
Mason	Count	13	113	126
	% within TRADE	10.3%	89.7%	100.0%
Carpenter & joiner	Count	4	82	86
	% within TRADE	4.7%	95.3%	100.0%
Electrical wireman	Count	2	66	68
	% within TRADE	2.9%	97.1%	100.0%
Plumber pipe fitter	Count	2	69	71
	% within TRADE	2.8%	97.2%	100.0%
Painter decorator	Count	1	72	73
	% within TRADE	1.4%	98.6%	100.0%
Steel fixer	Count	2	23	25
	% within TRADE	8.0%	92.0%	100.0%
Plasterer	Count	0	12	12
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	0	32	32
	% within TRADE	.0%	100.0%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	24	473	**497**
	% within TRADE	4.8%	95.2%	**100.0%**

DELIVERY OF TRAINING

Q-31 Have you ever interacted with DIT?

Respondents trade		HAVE YOU INTERACTED WITH DIT?		
		Yes	No	Total
Mason	Count	30	96	126
	% within TRADE	23.8%	76.2%	100.0%
Carpenter & joiner	Count	39	47	86
	% within TRADE	45.3%	54.7%	100.0%
Electrical wireman	Count	40	28	68
	% within TRADE	58.8%	41.2%	100.0%
Plumber pipe fitter	Count	33	38	71
	% within TRADE	46.5%	53.5%	100.0%
Painter decorator	Count	7	66	73
	% within TRADE	9.6%	90.4%	100.0%
Steel fixer	Count	1	24	25
	% within TRADE	4.0%	96.0%	100.0%
Plasterer	Count	3	10	13
	% within TRADE	23.1%	76.9%	100.0%
Welder fabricator	Count	3	29	32
	% within TRADE	9.4%	90.6%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	156	342	**498**

Respondents trade		HAVE YOU INTERACTED WITH DIT?		
		Yes	No	Total
Mason	Count	30	96	126
	% within TRADE	23.8%	76.2%	100.0%
Carpenter & joiner	Count	39	47	86
	% within TRADE	45.3%	54.7%	100.0%
Electrical wireman	Count	40	28	68
	% within TRADE	58.8%	41.2%	100.0%
Plumber pipe fitter	Count	33	38	71
	% within TRADE	46.5%	53.5%	100.0%
Painter decorator	Count	7	66	73
	% within TRADE	9.6%	90.4%	100.0%
Steel fixer	Count	1	24	25
	% within TRADE	4.0%	96.0%	100.0%
Plasterer	Count	3	10	13
	% within TRADE	23.1%	76.9%	100.0%
Welder fabricator	Count	3	29	32
	% within TRADE	9.4%	90.6%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
	Count	156	342	**498**
	% within TRADE	31.3%	68.7%	**100.0%**

If yes, in which of the following areas

Respondents trade		AREAS OF INTERACTED WITH DIT			
		Trade skills training	Trade skills upgrading	Trade testing	Total
Mason	Count	1	13	16	30
	% within TRADE	3.3%	43.3%	53.3%	100.0%
Carpenter & joiner	Count	0	8	31	39
	% within TRADE	.0%	20.5%	79.5%	100.0%
Electrical wireman	Count	1	19	21	41
	% within TRADE	2.4%	46.3%	51.2%	100.0%
Plumber pipe fitter	Count	0	10	23	33
	% within TRADE	.0%	30.3%	69.7%	100.0%
Painter decorator	Count	0	2	5	7
	% within TRADE	.0%	28.6%	71.4%	100.0%
Steel fixer	Count	0	1	0	1
	% within TRADE	.0%	100.0%	.0%	100.0%
Plasterer	Count	0	0	3	3
	% within TRADE	.0%	.0%	100.0%	100.0%
Welder fabricator	Count	0	1	3	4
	% within TRADE	.0%	25.0%	75.0%	100.0%
Total	Count	2	54	102	**158**
	% within TRADE	1.3%	34.2%	64.6%	**100.0%**

Q-32 Are you a member of any 'Jua Kali' association or the construction trade union?

Respondents trade		ARE YOU A MEMBER OF ANY JUAKALI ASS. OR THE CONSTRUCTION TRADE UNION?		
		Yes	No	Total
Mason	Count	56	70	126
	% within TRADE	44.4%	55.6%	100.0%
Carpenter & joiner	Count	45	41	86
	% within TRADE	52.3%	47.7%	100.0%
Electrical wireman	Count	42	26	68
	% within TRADE	61.8%	38.2%	100.0%
Plumber pipe fitter	Count	41	30	71
	% within TRADE	57.7%	42.3%	100.0%
Painter decorator	Count	44	29	73
	% within TRADE	60.3%	39.7%	100.0%
Steel fixer	Count	13	12	25
	% within TRADE	52.0%	48.0%	100.0%
Plasterer	Count	0	13	13
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	16	16	32
	% within TRADE	50.0%	50.0%	100.0%
Landscaper	Count	2	2	4
	% within TRADE	50.0%	50.0%	100.0%
Total	Count	259	239	**498**
	% within TRADE	52.0%	48.0%	**100.0%**

If no, do you think that such an organisation is necessary?

Respondents trade		IS AN ORGANISATION NECESSARY?	
		Yes	Total
Mason	Count	70	70
	% within TRADE	100.0%	100.0%
Carpenter & joiner	Count	41	41
	% within TRADE	100.0%	100.0%
Electrical wireman	Count	26	26
	% within TRADE	100.0%	100.0%
Plumber pipe fitter	Count	30	30
	% within TRADE	100.0%	100.0%
Painter decorator	Count	29	29
	% within TRADE	100.0%	100.0%
Steel fixer	Count	12	12
	% within TRADE	100.0%	100.0%
Plasterer	Count	13	13
	% within TRADE	100.0%	100.0%
Welder fabricator	Count	16	16
	% within TRADE	100.0%	100.0%
Landscaper	Count	2	2
	% within TRADE	100.0%	100.0%
Total	Count	239	**239**
	% within TRADE	100.0%	**100.0%**

Q-33 In your opinion, what would be the duties of an employee's organisation/union in matters relating to training?

Respondents trade		SOLICIT FUNDS FOR TRAINING		
		Yes	No	Total
Mason	Count	126	0	126
	% within TRADE	100.0%	.0%	100.0%
Carpenter & joiner	Count	84	1	85
	% within TRADE	98.8%	1.2%	100.0%
Electrical wireman	Count	67	1	68
	% within TRADE	98.5%	1.5%	100.0%
Plumber pipe fitter	Count	71	0	71
	% within TRADE	100.0%	.0%	100.0%
Painter decorator	Count	72	1	73
	% within TRADE	98.6%	1.4%	100.0%
Steel fixer	Count	24	1	25
	% within TRADE	96.0%	4.0%	100.0%
Plasterer	Count	13	0	13
	% within TRADE	100.0%	.0%	100.0%
Welder fabricator	Count	32	0	32
	% within TRADE	100.0%	.0%	100.0%
Landscaper	Count	3	1	4
	% within TRADE	75.0%	25.0%	100.0%
Total	Count	492	5	**497**
	% within TRADE	99.0%	1.0%	**100.0%**

Respondents trade		OVERSEE & CO-ORDINATE TRAINING		
		Yes	No	Total
Mason	Count	104	22	126
	% within TRADE	82.5%	17.5%	100.0%
Carpenter & joiner	Count	73	13	86
	% within TRADE	84.9%	15.1%	100.0%
Electrical wireman	Count	59	9	68
	% within TRADE	86.8%	13.2%	100.0%
Plumber pipe fitter	Count	64	7	71
	% within TRADE	90.1%	9.9%	100.0%
Painter decorator	Count	60	13	73
	% within TRADE	82.2%	17.8%	100.0%
Steel fixer	Count	25	0	25
	% within TRADE	100.0%	.0%	100.0%
Plasterer	Count	9	4	13
	% within TRADE	69.2%	30.8%	100.0%
Welder fabricator	Count	31	1	32
	% within TRADE	96.9%	3.1%	100.0%
Landscaper	Count	3	1	4
	% within TRADE	75.0%	25.0%	100.0%
Total	Count	428	70	**498**
	% within TRADE	85.9%	14.1%	**100.0%**

Respondents trade		REPRESENT CRFTSMEN IN CURRICULUM DEVELOPMENT COMM		
		Yes	No	Total
Mason	Count	39	87	126
	% within TRADE	31.0%	69.0%	100.0%
Carpenter & joiner	Count	20	66	86
	% within TRADE	23.3%	76.7%	100.0%
Electrical wireman	Count	15	53	68
	% within TRADE	22.1%	77.9%	100.0%
Plumber pipe fitter	Count	7	64	71
	% within TRADE	9.9%	90.1%	100.0%
Painter decorator	Count	14	59	73
	% within TRADE	19.2%	80.8%	100.0%
Steel fixer	Count	5	20	25
	% within TRADE	20.0%	80.0%	100.0%
Plasterer	Count	10	3	13
	% within TRADE	76.9%	23.1%	100.0%
Welder fabricator	Count	3	29	32
	% within TRADE	9.4%	90.6%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	113	385	**498**
	% within TRADE	22.7%	77.3%	**100.0%**

Respondents trade		DETERMIINE MINIMUM QUALIFICATIONS		
		Yes	No	Total
Mason	Count	24	102	126
	% within TRADE	19.0%	81.0%	100.0%
Carpenter & joiner	Count	15	71	86
	% within TRADE	17.4%	82.6%	100.0%
Electrical wireman	Count	6	62	68
	% within TRADE	8.8%	91.2%	100.0%
Plumber pipe fitter	Count	4	67	71
	% within TRADE	5.6%	94.4%	100.0%
Painter decorator	Count	6	67	73
	% within TRADE	8.2%	91.8%	100.0%
Steel fixer	Count	1	24	25
	% within TRADE	4.0%	96.0%	100.0%
Plasterer	Count	3	10	13
	% within TRADE	23.1%	76.9%	100.0%
Welder fabricator	Count	4	28	32
	% within TRADE	12.5%	87.5%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	63	435	**498**
	% within TRADE	12.7%	87.3%	**100.0%**

Respondents trade		MAINTAIN REGISTER OF QUALIFIED ARTISANS		
		Yes	No	Total
Mason	Count	62	64	126
	% within TRADE	49.2%	50.8%	100.0%
Carpenter & joiner	Count	43	43	86
	% within TRADE	50.0%	50.0%	100.0%
Electrical wireman	Count	29	39	68
	% within TRADE	42.6%	57.4%	100.0%
Plumber pipe fitter	Count	26	45	71
	% within TRADE	36.6%	63.4%	100.0%
Painter decorator	Count	32	41	73
	% within TRADE	43.8%	56.2%	100.0%
Steel fixer	Count	8	17	25
	% within TRADE	32.0%	68.0%	100.0%
Plasterer	Count	4	9	13
	% within TRADE	30.8%	69.2%	100.0%
Welder fabricator	Count	14	18	32
	% within TRADE	43.8%	56.2%	100.0%
Landscaper	Count	4	0	4
	% within TRADE	100.0%	.0%	100.0%
Total	Count	222	276	**498**
	% within TRADE	44.6%	55.4%	**100.0%**

Respondents trade		DISCIPLINE NON-PERFORMING CRAFTSMEN		
		Yes	No	Total
Mason	Count	12	114	126
	% within TRADE	9.5%	90.5%	100.0%
Carpenter & joiner	Count	4	82	86
	% within TRADE	4.7%	95.3%	100.0%
Electrical wireman	Count	1	67	68
	% within TRADE	1.5%	98.5%	100.0%
Plumber pipe fitter	Count	4	67	71
	% within TRADE	5.6%	94.4%	100.0%
Painter decorator	Count	1	72	73
	% within TRADE	1.4%	98.6%	100.0%
Steel fixer	Count	2	23	25
	% within TRADE	8.0%	92.0%	100.0%
Plasterer	Count	0	13	13
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	1	31	32
	% within TRADE	3.1%	96.9%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	25	473	**498**
	% within TRADE	5.0%	95.0%	**100.0%**

Respondents trade		VETTING OF TRAINEES		
		Yes	No	Total
Mason	Count	0	126	126
	% within TRADE	.0%	100.0%	100.0%
Carpenter & joiner	Count	0	86	86
	% within TRADE	.0%	100.0%	100.0%
Electrical wireman	Count	1	67	68
	% within TRADE	1.5%	98.5%	100.0%
Plumber pipe fitter	Count	2	69	71
	% within TRADE	2.8%	97.2%	100.0%
Painter decorator	Count	0	73	73
	% within TRADE	.0%	100.0%	100.0%
Steel fixer	Count	0	25	25
	% within TRADE	.0%	100.0%	100.0%
Plasterer	Count	0	13	13
	% within TRADE	.0%	100.0%	100.0%
Welder fabricator	Count	0	32	32
	% within TRADE	.0%	100.0%	100.0%
Landscaper	Count	0	4	4
	% within TRADE	.0%	100.0%	100.0%
Total	Count	3	495	**498**
	% within TRADE	.6%	99.4%	**100.0%**

Q-34 In your opinion, which of the following times are best suited for craftsmen training courses?

Respondents trade		TIMES BEST SUITED FOR CRAFTSMEN TRAINING				
		Weekdays from 5pm	Weekends (sat & sun)	Scheduled days	Block releases	Total
Mason	Count	22	68	33	3	126
	% within TRADE	17.5%	54.0%	26.2%	2.4%	100.0%
Carpenter & joiner	Count	8	59	13	6	86
	% within TRADE	9.3%	68.6%	15.1%	7.0%	100.0%
Electrical wireman	Count	8	26	34	0	68
	% within TRADE	11.8%	38.2%	50.0%	.0%	100.0%
Plumber pipe fitter	Count	5	32	33	1	71
	% within TRADE	7.0%	45.1%	46.5%	1.4%	100.0%
Painter decorator	Count	4	47	22	0	73
	% within TRADE	5.5%	64.4%	30.1%	.0%	100.0%
Steel fixer	Count	3	13	9	0	25
	% within TRADE	12.0%	52.0%	36.0%	.0%	100.0%
Plasterer	Count	1	9	3	0	13
	% within TRADE	7.7%	69.2%	23.1%	.0%	100.0%
Welder fabricator	Count	2	13	14	3	32
	% within TRADE	6.2%	40.6%	43.8%	9.4%	100.0%
Landscaper	Count	0	2	2	0	4
	% within TRADE	.0%	50.0%	50.0%	.0%	100.0%
Total	Count	53	269	163	13	**498**
	% within TRADE	10.6%	54.0%	32.7%	2.6%	**100.0%**

Q-35 In your opinion, what would be the most suitable venue to host such craftsmen training courses?

		MOST SUITABLE VENUE FOR TRAINING			
		Classroom	Government sites	Both 1 & 2	Total
Mason	Count	6	10	110	126
	% within TRADE	4.8%	7.9%	87.3%	100.0%
Carpenter & joiner	Count	5	7	74	86
	% within TRADE	5.8%	8.1%	86.0%	100.0%
Electrical wireman	Count	4	1	63	68
	% within TRADE	5.9%	1.5%	92.6%	100.0%
Plumber pipe fitter	Count	0	5	66	71
	% within TRADE	.0%	7.0%	93.0%	100.0%
Painter decorator	Count	1	3	69	73
	% within TRADE	1.4%	4.1%	94.5%	100.0%
Steel fixer	Count	3	1	21	25
	% within TRADE	12.0%	4.0%	84.0%	100.0%
Plasterer	Count	5	0	8	13
	% within TRADE	38.5%	.0%	61.5%	100.0%
Welder fabricator	Count	1	0	31	32
	% within TRADE	3.1%	.0%	96.9%	100.0%
Landscaper	Count	0	0	4	4
	% within TRADE	.0%	.0%	100.0%	100.0%
Total	Count	25	27	446	**498**
	% within TRADE	5.0%	5.4%	89.6%	**100.0%**

Q-36 In your opinion, what would be the most appropriate language of instruction?

Respondents trade		MOST APPROPRIATE LANGUAGE OF INSTRUCTION			
		English	Kiswahili	Both 1 & 2	Total
Mason	Count	6	23	97	126
	% within TRADE	4.8%	18.3%	77.0%	100.0%
Carpenter & joiner	Count	1	11	74	86
	% within TRADE	1.2%	12.8%	86.0%	100.0%
Electrical wireman	Count	1	2	65	68
	% within TRADE	1.5%	2.9%	95.6%	100.0%
Plumber pipe fitter	Count	2	5	64	71
	% within TRADE	2.8%	7.0%	90.1%	100.0%
Painter decorator	Count	0	2	71	73
	% within TRADE	.0%	2.7%	97.3%	100.0%
Steel fixer	Count	0	1	24	25
	% within TRADE	.0%	4.0%	96.0%	100.0%
Plasterer	Count	0	3	10	13
	% within TRADE	.0%	23.1%	76.9%	100.0%
Welder fabricator	Count	0	1	31	32
	% within TRADE	.0%	3.1%	96.9%	100.0%
Landscaper	Count	0	0	4	4
	% within TRADE	.0%	.0%	100.0%	100.0%
Total	Count	10	48	440	**498**
	% within TRADE	2.0%	9.6%	88.4%	**100.0%**

APPENDIX C: RESEARCH PERMIT AND AUTHORISATION

CONDITIONS

1. You must report to the District Commissioner and the District Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2)/four(4) bound copies of your final report for Kenyans and non-Kenyans respectively.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

GPK 6055—3m—10/2003

REPUBLIC OF KENYA

RESEARCH CLEARANCE PERMIT

(CONDITIONS—*see* back page)

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THIS IS TO CERTIFY THAT:

Prof./Dr./Mr./Mrs./Miss ISABELLA NJERI WACHIRA

of (Address) UNIVERSITY OF NAIROBI P.O. BOX 30197 NAIROBI

has been permitted to conduct research in.....Location,

NAIROBI.....District,

NAIROBI.....Province,

on the topic AN INVESTIGATION INTO THE TRAINING OF LABOUR IN THE INFORMAL CONSTRUCTION SECTOR IN KENYA

for a period ending 30th NOVEMBER, 2008

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Research Permit No. MoST 13/001/37C 764

Date of issue 13th NOVEMBER, 2007

Fee received KSHS 1000/=

Applicant's Signature

FOR: Permanent Secretary Ministry of Science and Technology

M. O. ONDIEKI

FOR PERMANENT SECRETARY MINISTRY OF SCIENCE AND TECHNOLOGY

REPUBLIC OF KENYA

MINISTRY OF SCIENCE & TECHNOLOGY

Telegrams: "SCIENCE TEC", Nairobi
Telephone: 02-318581
E-Mail:ps@scienceandtechnology.go.ke

JOGOO HOUSE "B"
HARAMBEE AVENUE,
P.O. Box 9583-00200
NAIROBI

When Replying please quote
Ref. NO.MoST 13/001/37C 764/2

13TH November, 2007

Isabella Njeri Wachira
University of Nairobi
P.O. BOX 30197
NAIROBI.

Dear Madam,

RE: RESEARCH AUTHORISATION

Following your application for authority to conduct research on: ***"An Investigation into the Training of Labour in the Informal construction section in Kenya"*** this is to inform you that you have been authorized to carry out research in Nairobi for a period ending 30th November,2008.

You are advised to report to the Provincial Commissioner and the Provincial Director of Education Nairobi before embarking on your research project.

On completion, you will be expected to submit two copies of your research report to our office.

Yours faithfully,

M. O. ONDIEKI
FOR: PERMANENT SECRETARY

FOR PERMANENT SECRETARY
MINISTRY OF SCIENCE AND TECHNOLOGY

CC: The Provincial Commissioner
NAIROBI

The Provincial Director of Education
NAIROBI

APPENDIX D: RESULTS OF CRAMER'S V TESTS OF ASSOCIATION

APPENDIX E: RESULTS OF CHI-SQUARE TEST

TRADES VERSUS RESPONSES TO THE QUESTIONNAIRE

Results	Q-1	Q-2	Q-3	Q-4	Q-5	Q-6	Q-7	Q-8	Q-9	Q-10	Q-11
Pearson's Chi-square	8.828	49.280	2.037	45.747	-	-	2.295	55.052	50.690	51.443	9.072
Degrees of freedom	4	2	2	2	-	-	2	2	4	4	2
Asymptotic significance (2 sided)	0.066	0.001	0.361	0.001	-	-	0.317	0.001	0.001	0.001	0.011

Results	Q-11a	Q-12	Q-12a	Q-13	Q-13a	Q-14	Q-15	Q-16	Q-17	Q-18	Q-19
Pearson's Chi-square	0.426	14.039	0.344	3.985	1.160	3.650	29.056	0.305	0.197	7.726	13.352
Degrees of freedom	1	2	2	2	2	6	1	2	1	2	6
Asymptotic significance (2 sided)	0.514	0.001	0.842	0.136	0.560	0.001	0.001	0.859	0.657	0.021	0.038

Results	Q-20	Q-21	Q-22	Q-22a	Q-23	Q24	Q-25	Q-26	Q-27	Q-28	Q-29
Pearson's Chi-square	0.013	0.307	3.528	35.797	0.943	0.998	0.261	0.998	0.467	0.727	0.325
Degrees of freedom	1	2	1	5	1	2	1	2	1	1	1
Asymptotic significance (2 sided)	0.909	0.858	0.060	0.001	0.332	0.607	0.610	0.607	0.494	0.394	0.568

Results	Q-30	Q-31	Q-31a	Q-32	Q-32a	Q-33	Q-34	Q-35	Q-36
Pearson's Chi-square	3.062	10.248	0.775	10.343	-	1.844	24.148	4.929	21.233
Degrees of freedom	2	2	2	2	-	2	3	2	2
Asymptotic significance (2 sided)	0.216	0.006	0.679	0.006	-	0.398	0.001	0.085	0.002

Notes:

Results obtained from SPSS by cross-tabulating trade versus the results of the questions

Higlighted values are those that are significant ($p<0.001$) = 24% of all the questions

Blank cells indicate constants where the results follow the trades exactly

APPENDIX F: PHOTOS OF CRAFTSMEN AND TRAINEES

Appendix D: Results of the Cramer's V test of association between all the variables in the craftsmen survey questionnaire

	Q-36	Q-35	Q-34	Q-33	Q32a	Q-32	Q-31a	Q-31	Q-30	Q-29	Q-28	Q-27	Q-26	Q-25	Q-24	Q-23	Q-22a	Q-22	Q-21	Q-20	Q-19	Q-18	Q-17	Q-16	Q-15	Q-14	Q-13a	Q-13	Q-12a	Q-12	Q-11a	Q-11	Q-10	Q-9	Q-8	Q-7	Q-6	Q-5	Q-4	Q-3	Q-2	Q-1
Q-36	1.000																																									
Q-35	0.155	1.000																																									
Q-34	0.070	0.202	1.000																																							
Q-33	0.104	0.298	0.268	1.000																																						
Q32a	0.000	0.000	0.000	0.000	1.000																																				
Q-32	0.103	0.251	0.193	0.238	0.000	1.000																																			
Q-31a	0.186	0.149	0.156	0.307	0.000	0.360	1.000																																		
Q-31	0.106	0.035	0.168	0.083	0.000	0.112	0.039	1.000																																	
Q-30	0.084	0.060	0.074	0.124	0.000	0.045	0.221	0.085	1.000																																
Q-29	0.144	0.287	0.118	0.446	0.000	0.153	0.059	0.089	0.207	1.000																															
Q-28	0.016	0.016	0.064	0.050	0.000	0.043	0.000	0.310	0.043	0.007	1.000																														
Q-27	0.184	0.279	0.319	0.487	0.000	0.371	0.270	0.123	0.465	0.103	0.039	1.000																													
Q-26	0.017	0.015	0.065	0.050	0.000	0.049	0.000	0.031	0.072	0.008	0.002	0.498	1.000																												
Q-25	0.057	0.279	0.173	0.357	0.000	0.128	0.177	0.103	0.229	0.083	0.015	0.313	0.015	1.000																											
Q-24	0.017	0.015	0.042	0.042	0.000	0.043	0.000	0.031	0.042	0.008	0.002	0.498	0.002	0.015	1.000																										
Q-23	0.037	0.109	0.113	0.165	0.000	0.028	0.061	0.026	0.153	0.017	0.005	0.121	0.005	0.034	0.005	1.000																									
Q-22a	0.073	0.141	0.127	0.172	0.000	0.118	0.200	0.053	0.231	0.097	0.083	0.126	0.083	0.143	0.083	0.164	1.000																								
Q-22	0.056	0.220	0.076	0.215	0.000	0.151	0.119	0.032	0.179	0.039	0.006	0.000	0.000	0.000	0.000	0.000	0.000	1.000																							
Q-21	0.169	0.157	0.194	0.258	0.000	0.223	0.293	0.574	0.327	0.106	0.059	0.342	0.036	0.199	0.036	0.101	0.089	0.076	1.000																						
Q-20	0.188	0.257	0.224	0.415	0.000	0.373	0.255	0.269	0.420	0.112	0.066	0.722	0.056	0.210	0.056	0.400	0.097	0.239	0.472	1.000																					
Q-19	0.127	0.214	0.145	0.200	0.000	0.207	0.214	0.194	0.265	0.101	0.032	0.531	0.072	0.130	0.072	0.353	0.126	0.194	0.277	0.619	1.000																				
Q-18	0.017	0.015	0.043	0.051	0.000	0.049	0.000	0.031	0.042	0.007	0.002	0.039	0.002	0.015	0.002	0.011	0.097	0.007	0.058	0.066	0.032	1.000																			
Q-17	0.080	0.134	0.133	0.284	0.000	0.163	0.117	0.215	0.234	0.147	0.010	0.205	0.100	0.139	0.010	0.284	0.139	0.032	0.138	0.196	0.251	0.576	1.000																		
Q-16	0.207	0.090	0.181	0.215	0.000	0.261	0.054	0.036	0.612	0.093	0.039	0.276	0.040	0.083	0.040	0.113	0.140	0.092	0.556	0.426	0.119	0.278	0.117	1.000																	
Q-15	0.136	0.109	0.174	0.226	0.000	0.207	0.312	0.605	0.363	0.257	0.043	0.226	0.044	0.176	0.044	0.201	0.158	0.111	0.686	0.227	0.185	0.187	0.156	0.372	1.000																
Q-14	0.182	0.244	0.216	0.251	0.000	0.205	0.179	0.407	0.548	0.222	0.111	0.394	0.168	0.267	0.168	0.179	0.243	0.196	0.442	0.324	0.181	0.576	0.166	0.487	0.263	1.000															
Q-13a	0.127	0.188	0.228	0.222	0.000	0.267	0.303	0.137	0.179	0.097	0.000	0.200	0.086	0.242	0.108	0.195	0.220	0.115	0.246	0.191	0.074	0.294	0.133	0.170	0.248	0.223	1.000														
Q-13	0.076	0.126	0.078	0.130	0.000	0.010	0.248	0.242	0.157	0.107	0.031	0.034	0.066	0.035	0.066	0.068	0.074	0.058	0.395	0.143	0.209	0.109	0.112	0.077	0.404	0.292	0.108	1.000													
Q-12a	0.019	0.147	0.126	0.261	0.000	0.134	0.604	0.221	0.233	0.061	0.097	0.196	0.000	0.112	0.000	0.188	0.288	0.058	0.139	0.245	0.256	0.171	0.214	0.157	0.282	0.214	0.293	0.077	1.000											
Q-12	0.169	0.072	0.150	0.130	0.000	0.159	1.000	0.748	0.235	0.126	0.051	0.256	0.041	0.137	0.041	0.103	0.089	0.032	0.855	0.382	0.267	0.149	0.188	0.263	0.754	0.516	0.262	0.382	0.000	1.000									
Q-11a	0.178	0.156	0.159	0.430	0.000	0.330	0.822	0.672	0.547	0.000	0.079	0.366	0.000	0.156	0.000	0.249	0.221	0.000	0.593	0.213	0.232	0.283	0.167	0.430	0.405	0.508	0.321	0.737	0.384	0.813	1.000								
Q-11	0.113	0.142	0.145	0.131	0.000	0.241	0.732	0.483	0.208	0.085	0.089	0.244	0.023	0.134	0.023	0.067	0.139	0.094	0.403	0.297	0.222	0.198	0.165	0.138	0.456	0.188	0.122	0.173	0.675	0.417	0.000	1.000							
Q-10	0.167	0.175	0.186	0.189	0.000	0.175	0.294	0.432	0.278	0.172	0.088	0.232	0.085	0.131	0.085	0.150	0.157	0.096	0.608	0.249	0.170	0.209	0.152	0.324	0.381	0.313	0.224	0.316	0.183	0.610	0.363	0.243	1.000						
Q-9	0.147	0.133	0.147	0.223	0.000	0.256	0.307	0.443	0.339	0.131	0.091	0.229	0.152	0.163	0.090	0.188	0.145	0.149	0.568	0.229	0.155	0.247	0.095	0.329	0.339	0.287	0.161	0.314	0.181	0.616	0.303	0.222	0.438	1.000					
Q-8	0.221	0.364	0.212	0.280	0.000	0.248	0.258	0.569	0.381	0.116	0.085	0.280	0.068	0.306	0.068	0.463	0.200	0.177	0.693	0.258	0.209	0.487	0.137	0.346	0.590	0.267	0.274	0.391	0.263	0.780	0.442	0.313	0.423	0.380	1.000				
Q-7	0.068	0.093	0.085	0.258	0.000	0.054	0.361	0.083	0.169	0.043	0.016	0.069	0.016	0.112	0.016	0.164	0.102	0.154	0.104	0.078	0.042	0.120	0.074	0.158	0.206	0.218	0.155	0.128	0.152	0.085	0.404	0.053	0.147	0.112	0.220	1.000			
Q-6	0.187	0.218	0.200	0.278	0.000	0.213	0.213	0.393	0.535	0.098	0.110	0.393	0.171	0.192	0.171	0.177	0.225	0.161	0.444	0.326	0.186	0.576	0.167	0.481	0.267	0.932	0.292	0.267	0.236	0.505	0.501	0.194	0.311	0.276	0.295	0.222	1.000		
Q-5	0.091	0.066	0.087	0.169	0.000	0.050	0.124	0.058	0.176	0.044	0.020	0.225	0.021	0.093	0.021	0.117	0.367	0.054	0.171	0.253	0.079	0.220	0.133	0.244	0.208	0.573	0.146	0.015	0.196	0.040	0.283	0.072	0.162	0.198	0.244	0.086	0.603	1.000	
Q-4	0.175	0.171	0.159	0.196	0.000	0.197	0.267	0.291	0.362	0.133	0.106	0.279	0.087	0.141	0.067	0.120	0.165	0.120	0.509	0.245	0.141	0.255	0.121	0.318	0.345	0.299	0.226	0.337	0.159	0.457	0.289	0.178	0.381	0.356	0.409	0.120	0.289	0.185	1.000
Q-3	0.115	0.107	0.115	0.266	0.000	0.114	0.099	0.175	0.284	0.099	0.033	0.226	0.033	0.207	0.033	0.142	0.220	0.416	0.282	0.207	0.126	0.298	0.107	0.232	0.206	0.170	0.134	0.098	0.243	0.183	0.197	0.165	0.150	0.151	0.288	0.110	0.125	0.254	0.179	1.000
Q-2	0.145	0.191	0.158	0.241	0.000	0.223	0.152	0.531	0.439	0.135	0.057	0.297	0.051	0.201	0.051	0.098	0.105	0.141	0.665	0.221	0.172	0.363	0.088	0.335	0.495	0.288	0.173	0.328	0.173	0.732	0.370	0.312	0.335	0.265	0.575	0.207	0.276	0.130	0.276	0.256	1.000
Q-1	0.136	0.132	0.124	0.285	0.000	0.181	0.194	0.139	0.280	0.114	0.075	0.232	0.061	0.187	0.061	0.158	0.248	0.414	0.338	0.200	0.136	0.278	0.120	0.267	0.167	0.193	0.180	0.106	0.276	0.158	0.299	0.200	0.156	0.150	0.233	0.123	0.173	0.223	0.176	0.542	0.159	1.000

Notes:
The significance of the values vary from between p<0.001 to p<0.3
Highlighted association are those deemed to warrant further investigation and are all at p<0.001 significance
The lowest value of 0 indicates no association between the variable or that one variable is constant
The highest value of 1 indicates perfect association between the variable

APPENDIX F: PHOTOS OF CRAFTSMEN AND TRAINEES

Plate 1: Craftsman working closely with trainee

Plate 2: Craftsman instructing a trainee

Plate 3: Trainee learns chiefly by observation

Plate 4: Craftsmen and trainees working together

Plate 5: Lesson in progress

Plate 6: Concreting involves many craftsmen and trainees