

**RICS PROFESSIONAL EDUCATION AND TRAINING FOR QUANTITY SURVEYORS AND THE
EXTENT TO WHICH IT IS RELEVANT IN THE CURRENT UK BUILT ENVIRONMENT MARKET**

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ABSTRACT

RICS PROFESSIONAL EDUCATION AND TRAINING FOR QUANTITY SURVEYORS AND THE EXTENT TO WHICH IT IS RELEVANT IN THE CURRENT UK BUILT ENVIRONMENT MARKET

Quantity surveying is a profession that plays a major role in the administration and financial management of construction contracts in the current UK built environment market. The level of expertise and competence demonstrated by a practising chartered quantity surveyor has consequences for the success or failure of a construction project. The Royal Institution of Chartered Surveyors (RICS) is one of larger professional bodies with jurisdiction within the UK built environment and is responsible for the education and training to full chartered membership of practising quantity surveyors.

The research explores to what extent current RICS professional education and training prepares the chartered practitioner with the skill and expertise to competently address issues of practice endemic in the current UK built environment market. Rationale for this research is the continuing increase in issues of conflict and dispute in UK construction (Allen 2013; Farah 2015; Rogers 2019); and equally the development of professional education and training for quantity surveying practitioners that enable these issues to be addressed with competence, probity and altruism. Reflection in practice developed the conceptual framework for this research and the theoretical constructs are derived from current research literature. Empirical research data has been gathered by survey and interview with practitioners themselves, which created a new approach and contribution to knowledge.

An inductive approach has been adopted for this research that explores the problem from a constructionist paradigm which provides an understanding for the scale of individual practitioner experience. Developing from an established inventory of what knowledge and know-how should be in place to a new understanding of how professional education and training for quantity surveyors actually works in practice. The research established that chartered practitioners self-assess themselves to be weak in thirteen fundamental quantity surveying competencies and these identified weaknesses are compared with current RICS policies of required levels of competency RICS (2019).

The research establishes a causal link between the occurrence of conflict and dispute in construction; practice-based issues for quantity surveyors; and practitioner self-assessed quantity surveying functions sensitive to lower levels of competence. These findings are the basis of recommendations subsequently made in the thesis that could be considered as a guide to improving standards of professional practice for quantity surveyors.

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Finally, I dedicate my thesis in memory of our daughter Alexandra, who died suddenly in 1998 and will be with us and amongst us forever.

DECLARATION

I declare that my thesis which I have presented for examination in Partial Fulfilment of the Degree of Doctor in the Built Environment complies with the following statements:

- Includes the results of my own study and research
- Is all my own work
- Has been presented to my supervisor before submission
- Has been granted Ethical Approval by the University of Salford

ABBREVIATIONS AND ACRONYMS

RICS	Royal Institution of Chartered Surveyors
APC	Assessment of Professional Competence
CIOB	Chartered Institute of Building
JCT	Joint Contracts Tribunal
NEC	New Engineering Contract
CIC	Construction Industry Council
NBS	National Building Specification
UK	United Kingdom
GVA	Gross Value Added
RIBA	Royal Institute of British Architects
ICE	Institution of Civil Engineers
RTPI	Royal Town Planning Institute
CPD	Continuing Professional Development
NOS	National Occupational Standards
AI	Artificial Intelligence
ACCA	Association of Certified Chartered Accountants
BMA	British Medical Association
GMC	General Medical Council
ISO	International Standards Organisation
SMM	Standard Method of Measurement
NRM	New Rules of Measurement
PFI	Private Finance Initiative
IQS	Institute of Quantity Surveyors
IT	Information Technology
ADR	Alternative Dispute Resolution

ANB Adjudication Nomination Board

'The Act' Housing Grants Construction Regeneration Act (2011)

SCL Society of Construction Law

DPI Disputes Potential Index

OCG Office of Government Commerce

ESRC Economic and Social Research Council

SPSS Statistical Package for Social Sciences

CAQDAS Computer Assisted Qualitative Data Analysis

BOS Bristol Online Services

GMP Guaranteed Maximum Price

HS2 High Speed Two

BIM Building Information Modelling

THESIS

RICS PROFESSIONAL EDUCATION AND TRAINING FOR QUANTITY SURVEYORS AND THE EXTENT TO WHICH IT IS RELEVANT IN THE CURRENT UK BUILT ENVIRONMENT MARKET

1. INTRODUCTION

Quantity surveying is a profession that plays a major role in the administration and financial management of construction projects in the current UK built environment market. The level of expertise and competence demonstrated by a practising chartered quantity surveyor has consequences for the success or failure of a construction project. This research project is an investigation into problematic aspects of professional practice in quantity surveying. The doctorate involves an evaluation of professional education and training for chartered quantity surveyors in relation to levels of competence in practice functions that are conceived to be connected with the occurrence of dispute, conflict and risk. This research is a study of the everyday in quantity surveying practice and the scale of individual practitioner experience. The Royal Institution of Chartered Surveyors (RICS) is one of the larger professional bodies with jurisdiction within the UK built environment and is responsible for the education and training to full chartered membership of practising chartered quantity surveyors. This research is focussed on the current UK construction market and the involvement of practising quantity surveyors who are chartered members of RICS; in particular, the post-graduation professional education, training and Assessment of Professional Competence (APC) period mandated by RICS, RICS (2019). The research explores to what extent current RICS professional education and training prepares chartered practitioners with the skill and expertise to competently navigate issues of practice endemic in the current UK built environment market.

This chapter provides a guide to the thesis which explains the purpose of the research and background and scope of the project. It includes an explanation of a rationale that drives the study and considers a predicted contribution to knowledge. The chapter identifies the

research aim, objectives, research questions and the corresponding research design. Concluding sections confirm research boundaries, an explanation of the thesis structure and a brief synopsis of the chapter contents.

1.1. The Author

The author is a practitioner scholar and this research project has been conducted from within the field of quantity surveying practice and professional education, as generically explained by Chynoweth (2013). The desire to embark upon this professional doctorate grew out of reflection in practice from over 50 years as a construction professional including 35 years as a chartered quantity surveyor. A more recent role in this long career has been practising as a support professional in the resolution of commercial and contractual problems on stressed and failing construction projects in the UK. Whilst carrying out this role the author observed professional competence in practice and levels of professional knowledge demonstrated by chartered quantity surveying practitioners involved in the project teams. This led to the conception of a view that a relationship exists between the level of competence demonstrated by practising chartered quantity surveyors and the extent of conflict, dispute and risk that exists in the construction phase of projects. This may appear to be an obvious statement but observing professional practice in action revealed to the author the existence of surprisingly low levels of competence in basic quantity surveying skills.

Over the course of a long career in construction, the author felt it appropriate to undertake supplementary training and acquire further professional knowledge in order to stay 'fit to practise' and meet the demands of industry. As career responsibilities evolved into project management, study for a Masters in this subject enhanced existing knowledge and training. Experience gained practising in construction from the 1990s onwards indicated that the dynamics of relationships involved in construction projects had become more adversarial,

litigious and sensitive to higher levels of risk for all stakeholders concerned. Research literature identifies the *'boom and bust'* economy to be responsible for these changes in business relationships, Seeley (1997). Dispute, conflict and risk remain key characteristics of the industry and are exemplified by high-value, high-risk failing projects including, for example, the new Wembley Stadium, Edinburgh Trams and the Faslane submarine facility.

During these times, expertise acquired in project management naturally led to roles dealing with problems of conflict and contractual disputes. In support of these responsibilities an academic qualification in construction law and dispute resolution was obtained which enhanced existing skills in a challenging environment. At the same time and for the last twenty years the author, as an accredited RICS assessor, has interviewed candidates for the RICS Assessment of Professional Competence (APC) Final Assessment interview which if successfully passed, confers the candidate with a 'chartered' status and membership of RICS (MRICS). The years 2011 to 2015 involved further contributions to RICS matters as an elected member of RICS Global Governing Council, which is responsible for the development of policy and governance of the institution. As a fellow of the Chartered Institute of Building (CIOB), the author is an examination marker of papers submitted by those wishing to become full chartered members of CIOB. A more recent commission has been to provide workshops and seminars for students undertaking an RICS linked apprenticeship programme together with acting as 'Counsellor' for a growing number of RICS APC candidates.

Whilst examining and advising the next generation of professionals, the author questioned the nature of the knowledge needed by chartered quantity surveyor practitioners for a competence to practise and a robust scepticism as to how they acquired and developed their professional knowledge. In particular, what technical knowledge chartered quantity surveyors are expected to acquire as part of their professional obligations and how well, or otherwise, it prepares them for rigorous issues of practice in the current UK construction market. This Professional Doctorate focuses specifically on acquisition of professional

knowledge in the context of commercial and socially significant practice-based issues of contractual conflict, dispute and risk. Furthermore this research project seeks to understand the nature of practice problems from the experience of practitioners themselves and offer a new academic explanation for these problems of practice that centres on the relevance of professional education and training implemented by the profession's governing institution, RICS.

1.2. Background

1.2.1. Quantity Surveying

This research project examines the professional practice of quantity surveying. It explores the means by which chartered quantity surveyors acquire knowledge and expertise to practise and the extent to which that knowledge is relevant for the demanding reality of practice in the current UK built environment market. The quantity surveyor has been an integral part of the construction industry and the built environment for the last 170 years, as referenced by Cartlidge (2017). Quantity Surveying is a knowledge-based profession at the heart of construction, requiring a qualification to become chartered that confers on an individual, membership of the profession's governing institution, the Royal Institution of Chartered Surveyors (RICS).

Practice as a chartered quantity surveyor involves applying the traditional skills of measurement and valuation together with the ability to prepare project documentation and implement systems of financial management. In addressing the obligations of practice a chartered quantity surveyor will be confronted with the reality of practice and the endemic problems of conflict, dispute and risk which are predicted to occur during the construction phase of projects in the current UK built environment. This research reviews the current RICS professional education and training and the extent to which it equips the chartered quantity surveying practitioner to address these practice problems.

The professional expertise of a chartered quantity surveyor and as such, the standard of professional education and training available to that individual, plays an influential role in the evolution of the built environment. Through procurement, cost management, budgetary control and the administration of construction projects, contracts and contractors, the profession makes a considerable contribution to the success, or otherwise, of projects in the public and private sectors. These disciplines mirror professional competencies prescribed in RICS the professional education and training programme for quantity surveyors. RICS believes it makes an important contribution to the built environment by promoting, administering and regulating the highest professional qualifications and standards in the development and management of land, real estate, construction and infrastructure, North (2014). The concept for this research considers the current position of RICS with regard to education and training for chartered quantity surveyors and whether this education and training has cognisance for practice problems encountered by construction professionals administering projects in the current UK built environment market.

Post-graduation an RICS APC candidate is required to complete a two year period of training prescribed by RICS to be '*structured training*'. This period of the candidate's preparation for the APC Final Assessment Interview is managed by a named RICS counsellor and supervisor. The two year period of structured training is an RICS requirement and education and training of the candidate is a defined responsibility of the counsellor and the supervisor. As such this is the procedure implemented by RICS to provide education and training for the candidate. Education defined as '*teaching and schooling*' and training defined as '*instruct in a skill; learn the skills needed to do a particular job or activity*', ("*Collins English Dictionary,*" 2014). During this RICS prescribed period the candidate is reliant upon the contribution from a counsellor and supervisor. This research examines the extent to which RICS prepares the candidate for practice following a two year period of '*structured training*'.

1.2.2. The Built Environment

The thesis makes continued reference to the built environment and for the benefit of clarity the entity is defined for this research with reference to the following literature. Placing quantity surveying practice in a wider context of the built environment provides a measure of importance for the profession and the issues of practice encountered therein. The concept of a built environment has been recognised from ancient times. Evidenced by the development of Greek cities from 498 BC to 408 BC and the work of Hippodamus of Miletos, the ‘father of urban planning’, who, it is said, produced designs that represented cities using a grid system of planning. In the late 1800s and early 1900s this aspect of classical antiquity inspired others to ‘reform the landscape in tandem with political change’. The phrase ‘political change’ indicates the much wider spectrum for that which is now considered to be ‘the built environment’. Lenihan & Fletcher (1978) referred to urban building as changing the local climate and how the mechanics of construction helped to create and control an artificial environment. They believed that there was no turning back, no return to nature, matters of transport, waste disposal and the need for access to the amenities of a large city had become important and to some essential.

More pertinently for quantity surveying and construction Chynoweth (2009) describes the built environment in terms of an inter-discipline that involves traditional construction, the property professionals, construction management, surveying, architecture, real estate, building science, engineering, landscape and urbanism. It follows that the axiomatic analysis which identifies built environment knowledge and professional expertise include the professional disciplines of management, economics, law, technology, and design, most of which fall within the scope of quantity surveying education and practice. This is confirmed by Temple (2004) and Griffiths (2004) who refer to the property and construction professions including architecture, town planning, land and property management, building surveying, construction technology, landscape design, housing policy and management, transport planning and urban regeneration.

Other research recognises much wider aspects of built environment concepts, Fazli et al. (2017) suggest that interventions in relation to the built environment regarding recognised health issues, such as obesity, could result in an effective policy for designing neighbourhoods that are more conducive to healthy and active living. The concept of a built environment has therefore developed into a complex, major, multi-faceted part of modern society with an importance that requires high standards of practice from participating professionals. As stated previously, the built environment has also been defined as the human-made space in which people live, work and recreate on a day-to-day basis meaning that research in the built environment covers human and organisational management, technology and the environment. Research that addresses problems created by humans from human activities involving infrastructure projects, urban spaces or buildings, Ahmed, Opoku, and Aziz (2016). The chartered quantity surveyor and quantity surveying practice skills therefore have a major part to play in developing a functional and successful built environment within the constraints of quality, time and cost.

1.2.3. The Construction Industry

Construction is another subject area in the field of study for this research and a brief evolution and history of how the industry developed in the UK is included here as a background that informs other strands of the research. At the beginning of the nineteenth century the UK construction industry comprised a collection of separate trades that tendered for work and were subsequently engaged separately to apply their particular trade specialisation. The work was co-ordinated and supervised by a project manager who managed the project to completion, a custom that prevailed throughout Europe at that time. The Napoleonic Wars in France (1803 – 1815) caused a huge demand in the UK for the government to construct barracks for soldiers engaged in the conflict. The demand was so great and size of projects so large that trades began to combine to form general contracting organisations and the ‘general contractor’ came into being. In 1828 construction for all public works using separate trade contractors was phased out in England and what was known as ‘contracting in the gross’ prevailed. The general contractor survived for the next

150 years until the demise of a directly employed labour force and a rise in the use of specialist sub-contracting companies which are now the fabric of contracting today. Since the nineteenth century the UK construction industry has undergone iterations of structure and development and its current manifestation is similar to customs that existed in the early 1800s (Cartlidge, 2011).

More specifically, over the last 30 years the construction industry has changed dramatically and evolved progressively without any evident direction or planning, Uff (2017). The 1980s saw construction comprising a number of substantial building and civil engineering contracting companies employing large numbers of engineers and construction professionals together with a large directly employed site labour force. Almost unnoticed and driven by the increasing commercial risk from a directly employed site workforce, the industry has seemingly reduced this liability by subcontracting or 'outsourcing'. More recently outsourcing has involved management and professional services together with labour, materials and the liability for design. The current term for this body of expertise and resource is 'the supply chain' which now is said to involve 80% of the physicality within construction. Uff (2017) observes that the construction industry, despite high profile government reports, Egan (1998); Latham (1994), remains adversarial and unable to engender cooperation, trust and goodwill for its contractual relationships. The occurrence of conflict and dispute in construction is on the increase; which would naturally require the need for high professional standards and new professional skills from chartered quantity surveyors. These practitioners who are at the forefront of management and administration issues encountered in construction are required to address the industry problems and issues.

In a government report produced by the Department for Business Innovation & Skills, Barawas and Fleetwood (2013) defined the construction sector as: (i) construction contracting industry; (ii) provision of construction related professional services; (iii)

construction related products and materials. The report confirms that construction is one of the largest sectors of the UK economy and makes a key contribution of almost £90 billion or 6.7% Gross Value Added (GVA). By 2018 this contribution had increased to £116.3 billion which was stated to be 6.1% of total gross domestic product, Green (2020). The industry comprises over 280,000 businesses which create 2.93 million jobs, equivalent to 10% of total UK employment. Contracting is the largest sub-sector of construction, contributing 70% GVA and 70% of sector jobs and in 2011 over 16,000 UK-based firms alone were specialising in architecture and quantity surveying services, accounting for £4.2 billion in GVA. Despite this considerable contribution to GVA, political commentators believe that the government, a very big client, is wary of construction, Ozioro (2018) and continues to regulate the economy by controlling the output of the construction industry. This is one of many factors that influence supply and demand, risk and uncertainty for clients and construction and another variable within the scope of professional practice. This opinion supports research that considers construction to be a major force in the UK economy and as such should be addressed accordingly by the professional service industry that provides expertise in managing its processes and procedures.

Despite making a major contribution to the UK economy, construction has not improved since Latham and Egan where the problems created by extreme fragmentation and a disconnected professional services structure were exacerbated by the long-standing tradition of cost-competitive tendering, Sweet (2018); Wates (2016). Single figure margins and the pressures of completion have caused shadow practices of commercial advantage to emanate from the tendering process and as an example Uff (2017) refers to the practice of appointing subcontractors at the latest possible stage in the construction process to gain additional margin. In effect, using prices from the supply chain to win work and then re-tendering work packages back out to the supply chain once the contract has been awarded. These commercial practices raise issues for professionalism, ethics, cooperation, good faith, mutual trust and fair dealing. The professional quantity surveyor in practice is exposed to

this range of endemic customs in the industry and is required to address and manage the consequences. These factors collectively increase risk, reduce profit margins and together with a vicious payment cycle, negate any enthusiasm for investment in process innovation.

Other factors impact on current difficulties surrounding the construction industry and Barawas and Fleetwood (2013), in their report for the government, identify that about 20% of vacancies in the wider construction sector remain persistent and hard to fill because staff with the right skills, qualifications and experience are absent from the employment market. A lower proportion of construction firms provide training or have established training plans compared with other industry sectors. Construction remains a complex and fragmented industry where an itinerate collection of trades, management and professionals come together and produce a one-off product that involves traditional artisan skills together with advanced technology and sophisticated design solutions. The practising chartered quantity surveyor is required to navigate this maze of conflicting and interdependent circumstances to perform professional obligations competently, ethically and with integrity.

The same government report by Barawas and Fleetwood (2013) identified a number of fundamental drivers that determine the success of a construction project including equitable financial arrangements and certainty of payment, supply chain management, strong relations and collaboration, effective site management and administration. The report also concluded that the UK has a world-class reputation for professional construction services such as architecture and the development of technology. The quantity surveying profession has a part to play in resolving and improving the performance of construction. This research has a proximity which is at the heart of the built environment, the construction industry and the associated profession of quantity surveying. It explores whether professional education and training provided for quantity surveyors by their governing professional institution RICS, is currently relevant and whether this training

enables a chartered practitioner to deal with issues that are endemic in the industry and beset the performance of construction.

1.2.4. Research rationale

Construction has always been a high risk, adversarial industry with low margins and fiercely competitive procurement practices, Farmer (2016). A chartered quantity surveyor practises at the heart of this commercial maelstrom. The extent to which a construction project is competently administered by a chartered quantity surveyor can often be the cause of conflict and dispute between the parties to a construction contract. Matters of conflict, dispute and risk are endemic in the industry with a continually rising trend and the consequential financial burden for public and private finances, as attested by (Allen, 2013; Farah, 2015; Kitt, 2018; Milligan and Cattnach (2018); Rogers,2019). This research consistently refers to 'practice-based issues' and current research undertaken by (Love et al, 2009; Allen, 2013; Genton, 2014; Ansell and McCafferty, 2017; NBS, 2018) and cited Current Case Law precisely define these areas of practice that are considered to be the cause of conflict and dispute in construction.

The author's first-hand experience, when providing a support role on failing contracts and contracts suffering from conflict and dispute, developed a working assumption about the realities of competency levels evident in quantity surveying practice. Chartered quantity surveyors representing both clients and contractors demonstrated, to the author, levels of competence that left issues of conflict unresolved. The burgeoning default position in the industry faced with contractual issues that remain unresolved is to outsource the problem to an external advisor. This development moves the problem away from the front-line chartered quantity surveying practitioner and heralds the beginning of the financial burden of another layer of professional fees for all parties engaged in construction. The author conceptualised these circumstances into a view that front-line issues of practice could be resolved by chartered quantity surveying practitioners having the necessary levels of competence to do so. This perceived absence of competence in the basic quantity surveying

functions and the lack of an ability to demonstrate a level of expertise and familiarity with issues of practice encountered in the current UK built environment market, could lead to the additional expense of external advice from a consultant.

The author believes that this is a shortcoming for the profession that is not addressed by current professional education. This recognised inability to deal with more complex contractual issues by the application of traditional quantity surveying skills has, in the opinion of the author, demoted the profession to a lesser support role, which is sad for the profession. A bias that is managed in this research through the disciplined curiosity of accepted research conventions adopted for this professional doctorate. It is suggested, therefore that RICS could review the changing demands of industry and have cognisance for the current needs of competent practice that could improve and promote the professional status of a chartered quantity surveyor and benefit both construction and the wider public. This research is placed in the everyday of professional practice through Social Science, the Arts and Humanities. It investigates the '*swampy lowlands*' of quantity surveying practice.

1.2.5. Contribution to knowledge

Within construction research scholars have explored the concept of professional knowledge; that is the curriculum of knowledge required to gain entry to the profession as specified by, in this research, RICS. Much scholarship to date has simply identified and explained the knowledge areas and competencies required by practising quantity surveyors. This has resulted in an 'inventory' of sorts which serves to provide a greater understanding of what types of knowledge and expertise should be in place for quantity surveying practice, (Ramus, 1981; Turner, 1983; Cornick and Osbon, 1994; Diekmann et al. 1995; Seeley, 1997; Male, 1998; Nkado and Meyer, 2001; Ashworth and Hogg, 2008; Lee et al. 2011). However, these studies do not provide evidence that this professional knowledge and expertise is, in reality, actually in place.

Yet, more recent research in the field has continued in this vein, focusing on new knowledge and competencies as they have been developed and charting the changing requirements of the professional qualification that is considered to be appropriate for practising chartered quantity surveyors, (Nkado, 1999; Fan et al. 2001; Cheung and Suen, 2002; Glover and Fenwick Elliot, 2005; Cheung and Wing Yiu, 2006; Ashworth and Hogg, 2008; Cheung and Hoi Yan Pang, 2013). As such, the focus of this body of research is normative; that is, it identifies a set of standards that need to be met. There is no attempt to engage with the practitioner's perspective on knowledge acquisition. That said, a strand of more critical scholarship can also be identified within the literature on professional education, focusing not only on the 'what' but also the 'how'. For example, Chappell et al (2009) focus on the work done by the practitioners' knowledge, asking whether professional education is sufficient to resolve current problems of practice. Love, et (2009) refer to individual professional values being dependent upon education, training and experience. Buchanan (2012) claims that professional education does not engage with current critical realities nor does it prepare students for the future in which they will practise. Yet these studies offer a minimal engagement with the concept of how professional education works in practice.

'Gaps' in professional knowledge have been a fruitful source of investigation for scholars. Allen (2011) and The National Construction Contracts and Law Survey (2015) explored practice-based issues but whilst the research clearly identifies the source of problems for professionals in practice, it offers very little explanation for the cause of the problems. A body of literature takes this analysis further and several studies point to an important causal link between professional knowledge, or the lack thereof, and practice-based issues or problems in the industry. According to (Diekmann and Girard, 1995; Kumaraswamy, 1997; Turner, 1999; Shorland, 1999; Turner and Simister, 2001; Turner, 2002; Bingham, 2010; Cheung, 2013; Breyer, 2013), a lack of professional knowledge and expertise demonstrated by practising quantity surveyors is a common problem. Whilst these studies identify problems with the knowledge base of quantity surveying practitioners this research seeks to

make a contribution to knowledge in three specific areas, 1. Why there are problems with the knowledge base of quantity surveying, 2. What consequences this has for professional practice, 3. There is not an evaluation of the practitioner's perspective on knowledge required for practice.

In summary, the extant literature on professional knowledge in quantity surveying focuses heavily on curriculum-side analysis which serves to provide only an inventory of knowledge and skills required for professional membership of RICS and competent practice. Whilst there is a developing corpus of research on how quantity surveying knowledge is used and crucially, how gaps in that knowledge can lead to problems in practice, the relationship between professional education, practitioners, their knowledge and professional practice in the industry remains poorly explicated. Most notably, extant literature has thus far failed to engage substantively with practitioners' own reflection on the relationship between their professional knowledge and professional practice. This research therefore responds to this gap in the literature by analysing the experiences and impressions of practising chartered quantity surveyors regarding professional education and training and its relevance for the issues encountered in practice-based scenarios.

1.3. Research Aim

The aim of this research is to evaluate RICS professional education and training for quantity surveyors and the extent to which it equips chartered practitioners with the ability to address practice-based issues encountered on construction projects in the current UK built environment market.

The research provides a surveyor-centred study on professional knowledge and analyses how knowledge is acquired and maintained, what defines competence and it explores gaps in practitioners' knowledge and the consequences of those gaps for their professional

practice. A 'bottom-up' approach to this topic is important because it uses individual practitioners' reflections on their practical expertise and training to illuminate bigger issues in the profession such as training and standards. Researching the practitioners' perspective avoids the pitfall of simply creating a list or inventory of what skills and knowledge the quantity surveyor ought to have. Instead, this project will explore the practical expertise or everyday work of the quantity surveyor in order to shed light on the role of knowledge in professional practice. An approach from 'bottom-up' demonstrates the way in which gaps in knowledge can lead to problems in professional practice.

1.4. Research Objectives

The objectives of this research are as follows:

- 1.** To identify and evaluate the development of the professions and professional knowledge in quantity surveying practice.
- 2.** To determine the theoretical nature and origin of professional issues faced by chartered quantity surveying practitioners during the construction phase of projects in the built environment.
- 3.** To determine the nature and extent of professional training and education for quantity surveyors designed, administered and regulated by the Royal Institution of Chartered Surveyors (RICS) with a focus on construction phase issues.
- 4.** To identify and evaluate practitioner perspective and experience of the nature, extent and practical utility of RICS mandated training in respect of the reality of construction phase issues including matters of contract administration and procedures for managing contract conflict and dispute.
- 5.** To develop recommendations for RICS professional education and training for quantity surveyors that could be considered as a guide to improving professional practice in dealing with construction phase issues on projects in the current UK built environment.

1.5. Research design

The author has demonstrated a background of embedded professional practice, mentoring, assessing and educating young practitioners. Through this research project the goal has been to understand, from the practitioners' experience, 'what is out there' and 'how was it for you'. This research pursues the argument that RICS education and training for quantity surveyors has not fully reacted to the current needs of practice resulting in consequences for public and private finances. The research is centred on practitioners themselves as a source of empirical data and adopts an inductive mixed methods approach. The perceptions, experiences and impressions of professional education and training and issues of practice encountered by chartered quantity surveying practitioners are captured using a self-administered online survey and semi-structured interviews. Current computer software is used to store and process data which is subsequently analysed for trends in quantitative responses and a theme analysis from the qualitative interview transcripts.

1.6. Research boundaries

The research focus for this thesis is the professional practice of chartered quantity surveyors working at the 'front-line' of the construction phase of projects in the current UK built environment market. The construction phase of a project, for this research, is deemed to commence with procurement methodology and conclude with an agreed final account. The construction phase of a project is often the period when major issues and problems are encountered, issues that can have serious impact on the successful completion of the project. The research is limited to construction projects undertaken only in the UK and case law referenced in the literature review is litigation in the UK under English law. The study evaluates RICS post-graduate education and training policies and procedures for quantity surveyors including an evaluation of the impact of aspects of the mandated two year period of structured training. The content and structure of RICS accredited undergraduate degree courses are not considered in any detail as part of this research project although the

qualitative empirical data from interviews does include impressions and practitioner experiences from their university undergraduate education.

1.7. Thesis structure

This doctoral research thesis is comprised of eleven chapters. There follows here a brief synopsis of each chapter:

Chapter 1 – Introduction

The thesis commences by introducing the research project with a brief explanation of the background, rationale, contribution to knowledge and the research design. The aim and objectives are set out and the research boundaries are established.

Chapter 2 – Literature Review – The Professions

Current theories in the field are explored in this chapter. Professionalism and the concept of the professions are critiqued through the work of others. Professional knowledge and professional competence is explained and this is followed by a review of RICS policies and procedures promoted for the professional education and training of quantity surveyors

Chapter 3 – Literature Review – Quantity Surveying and RICS

This chapter introduces and explains the profession of quantity surveying and defines the professional body that governs policies and procedure for the professional education and training of quantity surveyors.

Chapter 4 – Literature Review – Problems of Practice for Quantity Surveyors

The spectrum of practice-based issues encountered by practising chartered quantity surveyors are explored in this chapter supported by current literature.

Chapter 5 – Literature Review – Problems of Practice from Case Law

Current case law is identified in this chapter to demonstrate the reality of consequences emanating from practice-based issues for chartered quantity surveyors.

Chapter 6 – Methodology and Methods – Philosophies

This chapter explains the research philosophy and hypothesis resulting from the conceptual framework and the author's own reflection of quantity surveying practice and the conceptual framework that underpins the research argument.

Chapter 7 – Methodology and Methods - Techniques

The development of chosen research techniques are justified in support of the research argument, aim and objectives. Sampling and the sampling strategy is discussed including the means chosen participant selection. The concluding parts of the chapter describe methods adopted for data collection, storage and analysis.

Chapter 8 – Results and Data Analysis

Results of the quantitative and qualitative research methodology and methods are presented in this chapter, commencing with a brief review of the chosen techniques with reference to the research philosophy. The analysed results are presented in tables each with a supporting narrative that explains the data displayed. This chapter presents the processed and analysed results of the research and does not discuss the findings.

Chapter 9 – Discussion

This chapter brings together empirical results of the research and existing theory in the field from research literature. The extent to which one supports the other is presented in tables with accompanying discussions and observations.

Chapter 10 – Conclusions and Recommendations

Conclusions are made from discussions in the previous chapter and are set out in support of the research aim, objectives and argument. The chapter concludes with recommendations for RICS policies and procedures for education and training that could be considered as a guide to improving standards of professional practice for chartered quantity surveyors. The recommendations are based on findings derived from current theories in the field and the empirical data set for this research.

1.8. Summary of chapter

This introduction chapter provides a guide to the thesis which explains the background, research philosophy and concepts that have driven the project. The chapter has also identified a rationale for the research and a new contribution made to existing body of knowledge in the field.

2. LITERATURE REVIEW – THE PROFESSIONS

2.1. Introduction

This chapter introduces the concept of the professions and their relationship with society. A generic review of the aspects of this relationship is included in the first part of the chapter followed by an explanation of professional knowledge in its different forms and characteristics; concluding with a critical review of professional competence. RICS is the professional body that represents chartered quantity surveyors who are recognised as *'higher'* professionals within the professions. The purpose of this chapter is to examine the responsibilities that RICS has to its practitioner members, business and commerce and the wider public. These responsibilities are explored against the accepted definitions of a profession as a basis for a comparison with the reality of practice faced by chartered quantity surveyors. This chapter establishes the field in which this research project is placed.

2.2. The Professions – a history

It is becoming increasingly difficult to take for granted the importance of the professions and their role and responsibilities. The wider public and society have come to rely increasingly on the expertise of professionals in all aspects of business, commerce and government. Society has come to depend on professionals to solve its problems and encourage social progress, Schön (1983). The professions have a responsibility to the wider public and their members to provide knowledge and expertise to the extent that practitioner members are competent to practise. This omnipresence of expertise in modern society, it is suggested, could be a function of the increasing presence and amount of uncertainty, conflict and risk, Stehr (2009); Selinger and Crease (2006). Quantity surveying is a particular professional specialisation that provides expertise in measurement, valuation, financial and construction management, administration and legal supervision for construction projects in the UK built environment. This research project investigates whether training and education programmes for chartered quantity surveyors provide professional knowledge and

competence that is relevant for practice in the current UK built environment market; or whether it is simply a factor contributing to the increasing amount of uncertainty, conflict and risk in that market.

This part of the chapter reviews the history, development and ethos of the professions. The review aims to provide an understanding of the professions which helps to explain the conduct and governance of RICS in relation to education and training for quantity surveyors. The notion that RICS remains relevant in its policies and obligations to members and consequently the wider public is essentially part of the argument raised by this research. In developing that argument, the professions provide the context in which to place theories of practice problems which form the grounds for subsequent conclusions offered in the final part of the thesis.

Current research has charted the history of professions and Susskind and Susskind (2015) provide a summary which accords with other scholars contributing to social science literature who recognised that although the professions have been in existence since ancient Egypt, Greece and Rome, the nineteenth century saw the emergence of professions as we currently know them now. Surgeons, physicians, the legal profession closely followed by architects, engineers, surveyors and accountants, Smith (2009); Muzio, Hodgson, Faulconbridge, Beaverstock, and Hall (2011). Fifteenth century Europe witnessed the rise of law, medicine and divinity and the twelfth century saw architects in the form of master-masons and the guilds of the eleventh century. Medieval guilds including merchants, cobblers, bakers and carpenters came together in groups to establish standards, control competition, protect their members and at the same time, displayed the early signs of self-regulation, monopoly and the desire for status.

The City of London guilds were recognised by their ceremonial dress or livery from which they became known as *'livery'* companies. The Company of Barber-Surgeons was founded in 1540 from the Guild of Surgeons formed in 1368 and the Barbers' Guild which was granted a Royal Charter in 1462. Research suggests that these professional collaborations appear to come together for self-interest and status but at the same time offer benefits to the wider public and society. Specialist knowledge, expertise and high standards of practice as required by the authority that grants them recognition, power and status, (Susskind and Susskind (2015); Cruess, Cruess, and Johnston (2000)).

An aspect of the early development of the professions was the expectation from the public that the professions would be altruistic and moral and, as Schön (1983) explains, they would engage with the problems of society. The professions developed specialist knowledge that an average member of society found difficult to understand. As such the professions maintained monopoly of its use and had a continuing responsibility for providing the teaching of specialist knowledge that was current and relevant. As the professions developed it became evident that an antagonism existed between their values of altruism and that of self-interest. Faced with this criticism the professions have relied upon their association with academia to maintain and encourage their obligation to the public expectation of altruism, Cruess et al. (2000).

2.3. Exceptional expertise and social influence

The professions are a knowledge-based entity which have developed and promoted a corpus of expertise that is intrinsic to society. The Oxford English Dictionary defines a profession as *'a vocation or calling that involves some branch of advanced learning or science'*; *'A vocation in which a professed knowledge of some department of learning or science is used in its application to the affairs of others'* Quantity surveying is a profession, chartered quantity surveyors are professionals. RICS is the professional body that governs

the advanced learning, education and training for quantity surveyors to the extent that they are considered by RICS to be eligible for membership of the institution and are therefore allowed to practise as a chartered surveyor RICS (2018c). Accordingly RICS consider their members to have a sufficient level of competence to practise as a chartered surveyor.

The professions are regarded as having a social influence and Mitchell (2002) identifies the burgeoning influence of human reason that regulates social affairs; a growing technical control that human intellect has obtained over the natural and social world, intellect developed by the professions with specialist knowledge of the experts. As the professions pursued social influence and status, Schön (1983) explains that the professions have grown from 4% of the labour force in 1900, to 8% in 1950, 13% in 1966 and 25% in 2000. Growth of professions, learned societies and universities are seen to be the key functions providing education and professional knowledge in preparation for professional practice. Green (2015) charted that there are approximately 400 professional bodies in the UK which between them represent 13 million professionals. The professional bodies comprise the following types:

- Professional associations;

- Regulatory bodies;

- Learned societies

To the extent that current literature clearly identifies the growth of professionalism and the development of advanced learning for the benefit of society and the status of the professions and their members; some believe that modern society has tri-lateral functions: government; the private sector; the professions, Cruess et al. (2000). However, the development of advanced learning and the establishment of status cannot be without responsibilities and obligations. The theme of this research examines the extent to which education and training for quantity surveyors equips practitioners with the ability to address practice-based issues in the current UK built environment market.

The development of advanced learning and specialisms within the professions has been studied by Lester (2009) who defines professions as occupations that have developed and use expert and specialist knowledge on behalf of clients and society. At the same time taking autonomous responsibility for applying considered judgement in the use of that expertise through a commitment to a voluntarily prescribed set of professional rules and standards. The professions are recognised as having governance that establishes levels of entry requirements for its potential members and has the power to exercise self-regulation with the associated disciplinary powers. Lester compiled a useful abstract of twenty three major UK professions that existed in 2007. The abstract provides a basis for the following sample selection as a comparator for RICS:

Established 1818, Institution of Civil Engineers, 75,000 members;

Established 1837, Royal Institute of British Architects, 30,500 members;

Established 1845, Solicitor's Regulation Authority, 131,000 members;

Established 1868, Royal Institution of Chartered Surveyors, 140,000 members;

Established 1904, Association of Chartered Accountants, 315,000 members;

Established 1916, Nursing and Midwifery Council, 686,000 members;

Established 1998, General Teaching Council, 551,000 members;

This abstract helps to set the UK professions, particularly RICS, in a perspective of magnitude and provides an indication of the number of professional members in key occupations. RICS can be seen, from the table above, to be one of the larger built environment professions.

Earlier studies (Eraut (1994); Schön (1983) recognise that the professions are an essential part of society, a society which has come to rely on the expertise of professionals in all aspects of business and commerce. Susskind and Susskind (2015) in much later work agree

that the professions have become fundamental to our social and working lives. Eraut (1994) identifies that the professions remain a collection of social undertakings with an ill-defined boundary. Although law and medicine continue to be the most influential and powerful, others, for example, public-sector professions, teachers and nurses, as shown above, are described as 'semi-professions'. He concludes that 'professionalism' is an ideology defined as the social control of expertise where experts are required to carry out services for those who do not have an adequate level of knowledge to challenge or evaluate that service. The lack of checks and balances not possible by those who rely on professional expertise raises the issue of regulation where, unlike the European norm, UK professionals do not require state registration to practice, Lester (2009).

RICS is regarded as a good example of self-governance and regulation, recognised as source of evidence in support of various public enquiries, notably the conduct of UK press and media surrounding the murder of Milly Dowler in 2002. Lester (2009) identifies the advantages of a self-governing profession which is able to monitor and control a specialised labour market whilst at the same time maintaining standards for the benefit of wider society by providing an available remedy for practice errors that may occur in areas where laypeople do not have expertise. Smith (2009) and Susskind (2015) agree that professionals provide specialist knowledge, autonomy of practice, service to those who have need of the professions' particular knowledge and skills, but who are not able to challenge the application of that knowledge and expertise. This highlights the degree of protection available for recipients of professional expertise against matters of incompetence, exploitation and negligence. The ability of a professional body to effectively self-regulate is difficult to assess. The frequency of occurrences involving circumstances of incompetence and negligence becomes a tangible measure of professional competence and expertise. Subsequent sections of the literature review will identify practice-based issues in the context of quantity surveying and to what extent those issues inform RICS education and training.

Scholarly interest has grown in the professions since the 1970s and Smith (2009) considers that this is because they were recognised as having a position of privilege in society. Schon provides further insight into perceived privilege observing that the professions claim to be the source of extraordinary knowledge for the benefit of society and in return they are granted exceptional rights and privileges. A professional career is most respected and remunerative consequently so many current occupations aspire to be recognised as a profession, often referred to as the growth of 'professionalization'. Schumpeter (2015) illustrates how professionals are accustomed to wealth and privilege, using the analogy that in 2011, 57% of British undergraduates accepted to medical school came from the top three socio-economic groups. Specialist knowledge and expertise is the hallmark of professional status and the associated benefits of privilege. The professions have an obligation to the wider public and their membership to ensure that the development of extraordinary professional knowledge is relevant and current for the needs for competent practice. The extent to which aspects of self-regulation keeps pace with practice relevance remains outside any further regulation.

2.4. The 'grand bargain'

Previously referenced literature serves to demonstrate how customs, attitudes and behaviour exhibited by the professions provide an understanding for what has been referred to by Susskind, Eraut and Schon, now as the 'grand bargain'. Regarding the 'grand bargain' Eraut (1994) agrees that the professions have made an arrangement with society where competence and integrity are exchanged for trust from the client and society at large. Schön (1983) and Smith (2009) expand this theory proposing that the professions by their mere establishment and authority have rights and freedoms, autonomy and the power to determine who shall be allowed to practice and as such have a precept for social control. Further observations allude to specialist knowledge that can only be challenged by similarly qualified specialists which has caused some more 'radical' students of the professions to criticise professional education for being amoral, irrelevant, or coercive, Schön (1983).

Susskind and Susskind (2015) reinforces the concept of the 'grand bargain' by a more precise definition distilled from their research and a study of the relevant literature. The deal between professions and society, whether surgeons or chartered surveyors, is that the professions have developed an exclusive entitlement to provide services to the wider public. In return the professions have received, from society, a mandate for social control.

"In acknowledgement of and in return for their expertise, experience and judgement, which they are expected to apply in delivering affordable, accessible, up-to-date, reassuring, and reliable services, and on the understanding that they will update their knowledge and methods, train their members, set and enforce standards for the quality of their work, and that they will only admit appropriately qualified individuals into their ranks and that they will always act honestly, in good faith, putting the interests of clients ahead of their own, we (society) place our trust in the professions in granting them exclusivity over a wide range of socially significant services and activities, by paying them a fair wage, by conferring upon them independence, autonomy, rights of self-determination, and by according them respect and status"

The pertinent aspects of Susskind's definition of the 'grand bargain', for this research, are:

- Up-to-date knowledge and methods; enforced standards and quality of work;
- Only appropriately qualified individuals gain entry;
- Members should act with honesty and in good faith.

As a front-line professional body in the built environment and construction, RICS is assumed to accept the obligations of this 'bargain' on behalf of its members. A social contract, never written but often empowered by legislation and regulation that places the professions as custodians and gatekeepers of an enormous library of knowledge, experience and expertise fundamental to society and the economy. This research does not question the existence of

professions but, specifically regarding RICS, evaluates whether it fulfils its obligations to the 'bargain' and to its membership to provide relevant education and training. Regarding obligations and status, Smith considers that the professions, once divine, powerful and superior find themselves under increasing scrutiny from the public, government and various stakeholders. Shortcomings in self-regulation highlight where members are not consistently controlled by an equitable, systematic procedure, the lack of which brings the reputation and standing of the professions into disrepute attracting increased scrutiny from the government, the public and industry. The professions autonomously preside over a knowledge industry that produces and controls the use of knowledge in a manner that prevents access for those who are not members of the profession. RICS has a great responsibility to its members and society but in its quest for global relevance it may have neglected obligations nearer to home that have consequences for all its stakeholders.

2.5. Maintaining standards and status

This burgeoning evolution of the professions has tended to dilute the occupational status of recognition of their various specialisations and the wider public have witnessed high profile examples where professionals have misused their autonomy and used their status for illegitimate private gain, for example the extreme conduct of the General Practitioner and prolific serial killer Dr Harold Shipman. New technologies and processes sponsored and evaluated by professionals have often resulted in unintended side effects and a disparate and conflicting range of solutions for issues of national importance have added to the problems that proposed solutions were originally designed to resolve. The professions have therefore been faced with growing public criticism and a loss of faith in professional judgement which has resulted in claims for external regulation and for redress de jure for professional incompetence. This research explores the consequences of the programme of education and training promoted by RICS in the light of its responsibilities to its members and society.

Susskind and Susskind (2015) identifies that amongst authors in social science, whilst they agree that the professions have developed uniquely in history, there is considerable disagreement as to what is a profession. The professions, whether 'ideal type' or 'true' professions of medicine, law or accountancy or other 'semi-professions', they appear to have four commonalities: (1) specialist knowledge; (2) barriers to entry; (3) regulated practices; (4) a common set of values and ethos. For the benefit of doubt, professionals are human specialist belonging to occupational groups and institutes or institutions. Eraut (1994) identifies the construction sector as being a good example of how younger professions have been subsumed into the role of 'true' professions; where traditionally architects and engineers controlled building projects and employed other professionals, consultants, surveyors, service engineers, contractors, now architects are commissioned by companies who employ others to manage the project process.

Research by Hill and Lorenz (2011) attested that professional bodies have a responsibility under a charter or constitution to establish and sustain standards of professional practice and a code of ethical conduct. The same charter or constitution, regarding standards and a code of conduct for their members, will prescribe a custodial role for the professions on behalf of society and the built environment. Following on from Hill, the studies of Muzio et al. (2011) critiqued that professionalism and professionalization involves a limited amount of specialised technical resource being converted into an institutionalised process of remuneration. Regulation establishes barriers to entry which in turn serves to control a commercially advantageous level of expertise centred on a limited number of practitioners which as such adjusts the balance of supply and demand. Despite these observations by others, Green (2015) reiterates that the professions are traditionally dedicated to the advancement of the knowledge and the betterment of professional practice by developing, supporting, regulating and promoting professional standards for technical and ethical competence. The extent to which RICS is traditionally dedicated to promoting high

professional standards at the expense of global relevance is part of the argument raised by this research.

Gardiner (2015), from an interview for *Building Magazine*, with Paul Morrell, the former government construction advisor, following a report published by a government think tank called 'The Edge'; provides an epilogue for this analysis of the professions. Morrell identified that the principle institutions in the built environment are the Royal Institute of British Architects (RIBA); RICS; the Institution of Civil Engineers (ICE); and the Royal Town Planning Institute (RTPI), all of which enjoyed 'gold standard' status which was being usurped by the increasing power of contractors, which echoes a similar point made by Eraut (1994). Gardiner (2015) noted that Morrell had recognised a failure of the professions to collaborate on matters of education, ethical and enforcement policies failed to justify their status with the public and government. A failure of the institutions to collaborate and react on matters of public concern for major built environment issues also undermined the eminence that they hoped to maintain.

Sweet (2015) in a briefing for *Construction Research and Innovation*, on Morrell's reaction to the same 'Edge' report, observes that the institutions face real pressure and their conservatism has provoked critical claims of: protectionism that relies on existing practices and hierarchies by operating in siloes; discouraging young potential members and a failure to address a current need for change. The inertia of 'gold standard' professional bodies, described above, provides a reminder that there could be the symptoms of inertia apparent in the governance and administration of RICS professional education and training for quantity surveyors.

Gardiner's (2015) article also comments on the Edge Debate Report and he refers to the Hanseatic League of the Middle Ages, set up at the time to increase the status of influential

guilds, which eventually collapsed through its own internal fighting and protectionism; a parable for the situation facing the UK's built environment professions. The professions have a problem of relevance where the status of young professionals is denoted by the firm that employs them and not their personal professional standards and the professional institution to which they have gained membership. The professional institutions, it is suggested, need to be clear what they offer, why it is special and how that guarantee is underwritten. The traditional status values of the professions are based on exclusivity and jealously guarded barriers to entry, the global expansion of many institutions is an example of institutions looking further a-field to make up for losing relevance at home. RICS are actively seeking recognition globally in China, India, South Africa, South America, United States and Canada, which prompts the question as to whether a lack of relevance has been detected in the UK.

An illuminating insight by Robertson (1998), himself a QC, regarding the legal profession, explains that law is the wisdom of the old but neither law nor lawyers appear to be as repositories of any sort of wisdom at all. He suggests that society will normally regard lawyers as professionals who are mentally penetrating, gifted with discernment and practical wisdom but in reality their skills will be employed in conceiving ways around statutes, the likely outcome of precedents and the tactics that may triumph at trial. He illustrates his argument by the quote;

*“Professional people have no cares
Whatever happens, they get theirs”*

(Ogden Nash)

Robertson's observations seem to imply a lack of professional focus that detracts from the traditional professional values and responsibilities of altruism, integrity and equity to the public and the wider society. Circumstances of conflict and dispute in construction resonate with the same impression of a lack of professional focus in quantity surveying practice.

A current illustration from professional practice that confirms Robertson's conclusion is provided by Plender (2018) in a business article for the Financial Times, in which reference is made to the collapse of the construction giant Carillion and an audit function that should have been in the public interest but evidently appears to be a lucrative professional consultancy. The big four accountancy practices have been accused of furthering the interests of a cosy club. The big four (PwC, KPMG, EY and Deloitte) carried out 99% of audits for the FTSE 100 companies and have received £51.2m in fees from Carillion and a further £14.3m from government work relating to Carillion. The article suggests that the Big Four have failed the wider economy and society in general. In professional terms their audit work, in effect, is a guarantor for the integrity of financial accounts which support capitalism. Members of the public wishing to invest in FTSE 100 companies would expect to rely upon a prudent audit report from any of these notable accountants before committing private wealth for the purchase of shares.

The Big Four have franchised their names without being able to enforce sufficient checks and balances and consequently have undervalued the vital function of audit. The analogy of a cosy club not only reflects inertia referred to by Gardiner and Morrell in previous research literature but also complacency in an expectation that the function of audit is limited and restricted to a few large professional organisations. RICS is the only professional body representing practitioners with the designation of chartered quantity surveyor; this research asks whether this exclusivity has engendered complacency and a lack of current relevance in its governance of professional education and training for quantity surveyors.

This section of the study provides a current view of the professions, an anthology that recognises the promises made by experts and the consequences for those who respect and trust in their expertise. The scholarly observations and explanation of the professions, their descriptions of the professions characteristics, obligations and responsibilities to society provides a basis upon which a comparison can be drawn with circumstances encountered

from the harsh reality of practice in the current UK built environment. Notably the literature does not address responsibilities of professions to their members and there prevails an assumption that the professions are also fulfilling their obligations in this regard. This research examines the extent to which RICS provides relevant education and training for quantity surveyors and suggests that this aspect of responsibility be the subject of further assessment.

Reflecting on the characteristics of the professions and RICS and with cognisance of the consequences of practice-based issues in construction, this research seeks to evaluate whether RICS solves our problems and enables our society to make social progress by educating and training for quantity surveyors to the extent that is relevant, current and enables the practitioner to practice competently. Professions are assumed by their ethos to make a positive contribution to develop services and maintain educational policies that are fit for purpose. RICS members are controlled by the self-regulation policies of the institution which should demonstrate to the public, probity, transparency and altruism but research suggests otherwise. The visible failures of professionally designed and managed solutions to public problems have generated consequences more problematic than the original issues they were designed to solve (for example the Grenfell Tower disaster in June 2017). Self-interest, bureaucracy and a reluctance to be cognisant for the best interests of the public, business, commerce and government manifest in RICS policies regarding professional knowledge and the ability to keep pace with the needs and problems of society.

2.6. Professional Knowledge

The professions are custodians of knowledge and expertise in our society and this section of the chapter defines and explains the different types of professional knowledge and the respective sources of that knowledge. This part of the chapter identifies the spectrum of professional knowledge which provides an understanding of how and if RICS has

incorporated these various sources of knowledge into its programme of education and training for quantity surveyors.

2.6.1. Generic Considerations

The professions are knowledge-based organisations and therefore they have the responsibility of awarding fully-qualified status for their members, Lester (2009). This, for a member, could signify a licence to practice or denote the right to work in the profession or simply be a route to wider vocational opportunities. Across the professions qualified status is achieved following the successful completion of a university degree and/or a post-graduate qualification. However, other routes to qualification are evolving and access to the professions based on experience or through a technician or para-professional training that does not include a university degree, are increasing. The evolution of pathways to professional qualification has been influenced by a rapid increase in graduates over the last ten years together and with the development of lifelong learning. Entrants to the professions come from a variety of backgrounds and seek membership at a different point in their careers with different and more obvious practical skills and experience. These traits are a distinct advantage for the professions as the benefits of tacit and implicit knowledge become more relevant. However, the most common starting point for training and education by professional bodies is to approve or accredit university courses as fulfilling part of its knowledge requirements and establishing a credible level of entry and status for potential members.

Professional knowledge is the knowledge necessary for a professional practitioner to practise competently and in a manner expected by society, business and commerce; the theory and practice of professional performance, Eraut (1994). Knowledge that supports a competency that is defined legally as being to a standard of reasonable skill and care, a standard that could be expected from reasonably competent professional. Medical practitioners, architects, engineers, accountants, surveyors, teachers and nurses and other occupations seeking to be recognised as a profession, all must acquire sufficient knowledge

for the skills of their professions in order to practise. This section of the study explores how this knowledge is defined in current literature and explains its various forms and how professional knowledge, in theory, is obtained.

The work of Eraut (1994), previously referred to, remains the source of prominent scholarly intervention in the study of professions, professional knowledge and professional education. His work is particularly centred on the teaching profession but is, none the less, equally relevant for professions in the built environment. Professional knowledge is defined by the way that it is acquired and used in practice, in part codified but predominantly developed through experience and an iterative acquisition of the interpretation of experiences. Professional knowledge cannot be simply learnt and then put into practise, it is, in the reality of practice, context-dependent and as such has to be reconstituted in different contexts and situations which in turn generate new knowledge.

Researchers have suggested that the success of professions has been the result of an escalating 'knowledge industry' which has supported the professions as they attempted to address the problems and aspirations of society. However, this assumes that the academic support generated by the 'knowledge industry' is current and relevant for professional practice. Unfortunately the professions have been party to a series of unsuitable solutions to public problems which suggested that knowledge applied by the professions was not as relevant or appropriate as was expected. The professions, therefore, have suffered a lack confidence in the knowledge industry which has left professionals and the public with a lack of faith in the competence of their expertise. This has seriously questioned the authority of the professions, however, research by Schön (1983) focusing on professional knowledge seems to argue conversely in that if professional knowledge were to be abreast of the rigors of professional practice, the betterment to professional performance would be marginal. This in itself is evidence of an unprecedented requirement for professional adaptability and the need for the application of professional knowledge to be context-specific. The study by

Schön (1983) identifies a dilemma for the professional in bridging the gap between an existing body of knowledge and the expectations of society which involves business and commerce, the public and government.

There is a clear divide between 'technical knowledge' and 'practical knowledge' (Eraut (1994). Technical knowledge is codified and explicit whereas practical knowledge is demonstrated in practise and can only be acquired through practise. Although problem-solving, decision-making and communication skills are described in text books, this written source of practical knowledge is different from implicit, intuitive know-how learnt from experience. For example learning to work in teams within organisations is often not covered by professional education and professional ethics can be very difficult to conceptualise for young professionals. Eraut (1994) refers to 'knowledge of people' where communication skills are developed by learning from experience but these experiences cannot be stereotypes as they are not context-specific. Technical knowledge is utilised systematically and explicitly whereas practical knowledge does not conform and is implicit. With reference to Broudy (1964), Eraut (1994) provides the following classification of knowledge application:

Replication, higher education, derived from a teacher or textbook;

Application, applying knowledge within rules and procedures;

Interpretation, understanding from interpreting rules and procedures;

Association, professional judgement, practical wisdom and experience

Professional practice is populated by unique events which call for an approach often referred to as an art or the 'art of practice', Schön (1983). Literature identifies that if the art of practice were a constant menu of guidance and practice notes then the skills could be taught. Unfortunately in reality uncertainty prevails and practitioners are involved in conflicts of values, conflicting goals, purposes, customs, ethics, personalities and authority.

The practitioner is faced with competing views of professional practice and conflicting versions of a professional role. A multiple choice for solutions to problems of practice requires the practitioner to navigate and pursue a route of personal preference in completing the task. This can develop into a crisis of confidence in performance for practitioners which in turn indicates conflict between traditional paradigms of practice and professional knowledge. Aspects of the reality of practice situations which create tensions for practitioners include complexity, uncertainty, instability and uniqueness. Regarding the 'art of practice' and its ubiquity, in reality, whilst it may not be teachable there may be ways in can be learnt by some. The model of professional knowledge has possibly been taken for granted and professionals cannot adequately explain and transfer procedures that are fundamental to professional competence.

Susskind (2015) recognises that the special characteristics of knowledge help to explain how the professions create and use knowledge. He sees a shift from a print-based industrial society to a technology-based internet society that is transforming the work and knowledge generation of the professions. The concept of practical expertise is problem solving knowledge that has established the professions, a knowledge mix of formal knowledge, know-how, experience and skill. Whilst this concept still prevails, Susskind identified a rise in technology-based sources of professional knowledge. RICS education and training for quantity surveyors remains, for the time being, based on the traditional concept of professional knowledge which is considered by the institution to be appropriate to sufficiently keep pace with the immediate demands of industry and commerce.

Knowledge is fundamental to the work of professionals and the acquisition of knowledge through education and training has always set the professional apart in society, part of the 'grand bargain' of privilege, eminence and reward. Susskind and Susskind (2015). However, Susskind recognises that professionals, whilst basking in the glow of privilege and status, rarely rise to the obligations and responsibilities of being part of a 'knowledge business' and

a 'knowledge economy'. It is proposed that knowledge has four distinct characteristics explained by Susskind as follows:

It is non-rival, that is it is not reduced in volume by use always remaining available for others;

It is difficult to make exclusive;

Use and reuse generates more knowledge;

It can be processed into a digitised form.

These four characteristics highlight the absence of tacit knowledge and raise the question of how tacit knowledge is acquired and utilised by practitioners. It also raises the question as to how the acquisition of tacit knowledge is addressed by RICS in its programme of education and training for quantity surveyors.

2.6.2. The Philosophy of Professional Knowledge

Philosophy defines knowledge as a 'justified belief' and without justification or if we do not know it to be true then it cannot be referred to as knowledge. The theories of knowledge relate to the nature of knowledge, the limits of that knowledge and how that knowledge is obtained, (Knight and Ruddock (2008); Eraut (1994)). Further factors to consider relate to the type of knowledge available and whether it can be expected to be sufficient and, as stated above, legitimate. Epistemology is the theory of knowledge, or how we know what we know. This section of the review commences by considering the epistemological aspects of professional knowledge. The philosophies of professional knowledge are recognised as being a combination of objectivism and constructionism. Early career learning consists of predominantly codified undergraduate studies and later post-graduate education develops a constructionist philosophy. The undergraduate propositional knowledge exists outside any consciousness whereas post-graduate professional learning, whilst retaining codified aspects of practice, relies on experience and the engagement with realities (Crotty (1998)). However, Schön (1983) recognised that the professions are bound by an epistemology of practice that

cannot be explained and does not account for the competences that are identified as being the most important for practice. This assertion appears to be stating that the theories of professional knowledge do not encompass competencies that are recognised as good practice.

2.6.3. Propositional Knowledge

Professionals usually commence their professional education and training by completing a university degree. The level of entry for a university degree establishes the academic status for a profession. Knowledge obtained from a degree course is known as propositional knowledge defined as being based on fact, theory and empirical research and Smith (2009) suggests that propositional knowledge is the basis of practice 'know-how' and is embedded in the physical act of practice. Eraut (1994) expands on this concept by proposing that propositional knowledge is academic teaching which has the following distinct characteristics:

It is based on a discipline of concepts and theories;

It includes generic principles of practice action;

It involves specific 'propositions' regarding case-related practice actions.

Propositional knowledge is typically the basis of higher education curriculum and as stated above, the application of propositional knowledge is the basis of practice. Propositional knowledge is sometimes considered to be over theoretical, but is none the less transferable between different contexts of practice and as such is offered as a rational response for basic matters of practice. Propositional knowledge has also been referred to by others in the past as '*Type 1. Knowledge*' both Smith (2009); Huff (2000) explain that this is an older terminology for the same type of knowledge with a more positivist post-war approach. Propositional knowledge is acquired through higher education by a teaching and lecturing methodology, rote learning and memory. Eraut (1994) identifies more specifically processes that extract and collect propositional knowledge including library expertise, study skills,

referencing, textual analysis, reading, listening, extract meaning sources of knowledge, consolidating, integrating, reorganising.

However, research suggests that there should be a balance in the acquisition of propositional knowledge between the time spent acquiring the knowledge set against time spent learning how to use it; and a balance to be made for the actual quantity of knowledge required. The content of propositional knowledge is predominantly the realm of academics who decide on the content for a curriculum that may not necessarily be formulated in the best interests of the needs for practice, Eraut (1994). The choice of subject areas may be influenced by the aspirations of status and reputation for the academy in question. Thus a conflict may exist between the needs of an academy and the needs of practice.

RICS has granted accreditation to a specific list of 26 No. quantity surveying degree courses that are assessed to provide the required entry level for graduate quantity surveyors seeking professional membership of the institution ((RICS), 2019). The content of these courses that consist predominantly of propositional knowledge is adjudged by RICS to be relevant for practice in the current built environment market.

2.6.4. Type 2. Knowledge

Type 2.Knowledge is described by Smith (2009), Gibbons (1994) and Huff (2000) as the product of a collaboration between academics and practitioners which generates knowledge from the realities of practice but is complimented and refined by the academy. Type 2 Knowledge is a fruitful partnership that develops new ideas and problem-solving solutions from outside the university and is not theoretical or propositional. This type of professional knowledge is best described as Doctoral Research.

2.6.5. Explicit Knowledge

Explicit professional knowledge, by definition, sits at the intersection of propositional knowledge, Type 2 knowledge and tacit knowledge. It is codified practice knowledge produced by academia without the input of academic practitioners and without the know-how of tacit knowledge. Explicit knowledge is described by Nonaka, Takeuchi, and Umemoto (1996) as being derived from the reality of practice, from task performance and the ability to apply skilful action across different contexts. Explicit knowledge can comprise the spoken word; it can be formulated into text, drawn or written. Explicit professional knowledge is not tacit knowledge but is inextricably linked to tacit knowledge and is accessible through consciousness. E. Smith (2001) understands explicit professional knowledge to be based on academic learning and academic achievement and being a formalised academic text based on established 'know what' work processes. Without being tacit, explicit professional knowledge is a codified translation of the action of practice. Ellis (2004) explains explicit knowledge in relation to learning a second language and in that regard explicit knowledge is what we know but not necessarily knowing how to use that knowledge. For example we know that a hammer is a hammer but we do not necessarily know how to use it as a tool. As others have stated, explicit knowledge is a conscious awareness which can be translated on demand into speech and as such is a declarative representation of memory. Explicit knowledge is easily communicated through a code or in a language comprising words, numbers, statements, mathematical expressions, specifications and manuals Koskinen (2003).

2.6.6. Tacit Knowledge

Tacit knowledge is another element of professional knowledge; it is fundamental to the development of professional skills and makes a considerable contribution to the accumulation of professional knowledge. Smith (2009), Eraut (2007), E. Smith (2001) and Eraut (1994) explain that tacit knowledge is not easily transferable because it is difficult to explain to others and also difficult to justify to oneself. However, the recognised learning processes for tacit knowledge include:

Direct supervision by line managers;

Designated mentors; but often few take the role seriously.

Coaching; by more senior colleagues.

Shadowing; and visits to other sites or offices.

Conference attendance: rare for young professionals.

Short courses; more popular with young professionals.

Working for a qualification; can be an initial delay in recognising relevance.

Independent study: training manuals, guidance notes, codes of practice.

Asking questions.

Tacit knowledge is knowing-in-action which leads to intelligent action, practice performance that is involuntary and intuitive and unconscious. Tacit knowledge is the 'art' of practice that comes from reflection-in-action which becomes knowing-in-action Schön (1983). The expert does not necessarily refer to codes of practice, rules or guidelines and other codified forms of professional knowledge but relies on intuition and an in-depth tacit cognisance Eraut (1994).

Koskinen (2003) refers to knowledge management and how it can improve performance by utilising technology to collaborate and share knowledge. However the main thrust of his paper speculates on how tacit knowledge can be captured to benefit the need to solve workplace problems. Tacit knowledge is described as learning from individuals' experience and contributes to the competent performance of tasks. Other factors that influence competency are identified as personal characteristics and explicit knowledge. Tacit knowledge has been aptly conceptualised by scholars in the phrase "we know more than we

can tell” and vitalised by the analogies of riding a bicycle, facial recognition and the ability to swim. As stated above, tacit knowledge is difficult to communicate, one to another.

The skill to carry out work is referred to as competence but personal skill and competence is not a static trait and is continually influenced by a person’s ‘situated practices’. Human capital is the essence of tacit knowledge acquisition and there are two main factors that influence how it can be gathered to benefit an individual or organisation. Internal factors are characterised by the persona, for example, memory and communication and motivational systems. Memory includes experience, mental models and intuition; communication systems include interaction, language, proximity or sources of data that become knowledge. Motivation is a driver of tacit knowledge acquisition that engenders trust between colleagues to enable them to share and receive intuitions and inklings. External factors that influence tacit knowledge acquisition include leadership style and organisational culture which define circumstances where tacit knowledge can be used. Intuition is part of tacit knowledge and is described by Koskinen as the way an expert practises using mental examples based on experience. Intuition is a ‘second nature’ which has developed from various sources of explicit knowledge and is said to be the result of tacit knowledge acquisition.

Tacit knowledge is acquired by interaction between people where circumstances and situations have been interpreted, internalised and understood. Interaction within an organisation may include face-to-face conversations, telephone conversations or electronic mail and written forms of communication. Meaning and correct interpretation, one to another, can be gauged from feedback and any ambiguity can be addressed as necessary for complete understanding. The most productive form of interaction is face-to-face encounters where organisational colleagues get to know each other developing robust social networks which reduce misinterpretation of the transfer of knowledge. Koskinen believes that organisational culture is the main driver for tacit knowledge acquisition and the

organisation's personnel, through informal interpersonal interaction, will establish shared values that increase the opportunities to benefit from the epistemology of tacit knowledge. However, the overriding factor in acquiring tacit knowledge can be the willingness, or not, between personnel to acquire and share tacit knowledge for the benefit of the organisation and other colleagues. Tacit knowledge is shown by these citations to be an important part of professional development. Subsequent references will demonstrate to what extent RICS professional education and training for quantity surveyors embraces this particular ontological aspect of professional knowledge.

Chaplin and Akao (2003) investigated the relationship between two main aspects of knowledge and the knowledge systems operating in the brain. The theme of their study addresses how 'know what' knowledge can be processed to provide 'know how' knowledge. Relative to professional practice and problem solving theories, Chaplin and Akao assert that 95% of knowledge required to resolve most technical problems exists in other industries. Whilst the theory is easily conceptualised it is more difficult to put into practice and this is explained by the fact that there are two distinct knowledge systems active in the brain. Conceptual knowledge is derived from conceptualising the problem or question whereas faced with the actuality of the problem or question, tacit knowledge provides the answer. These two types of knowledge have been defined as 'know what' (explicit knowledge) and 'know how' (tacit knowledge). Both of these types of knowledge are relevant for professional practice and the research shows that tacit knowledge can be gathered from other sources and translated into explicit knowledge in the form of targets and required quality standards. Explicit knowledge is then interpreted into task specifications (know what) and incorporated into regular procedures to become new tacit knowledge (know how).

2.6.7. Continuing Professional Development (CPD)

Another recognised part of educating and developing a professional is the implementation of Continuing Professional Development (CPD). Green (2015) in a report for the Chartered

Institute of Building (CIOB), identified that regarding professional education, training and CPD, the professions collaborated with education bodies and training providers to ensure that existing and potential members received 'the appropriate' qualifications, training and professional development to practise. Green believes that the professions are central to prescribing and monitoring standards of professional education and training, ensuring that a university degree and other courses remain relevant and keep pace with the changing needs of industry, commerce, the economy at large and the wider public. Green also considers that the professions vigorously support and regulate CPD. However, the research does not provide sufficient evidence to support that this is actually the case.

Cracknell (2012) researched CPD and produced a Best Practice Guidance for Professional Institutions for the Construction Industry Council (CIC) which defines CPD as an activity undertaken by any qualified professional that enabled the continuance of their professional development. CIC found from consultation with the built environment professional groups that awareness and engagement with CPD was varied. The guidance document recommends a number of actions that professional institutions could embrace to enhance the benefits of CPD, some of which include:

- More communication with members about CPD;

- Vigorous monitoring of CPD activities to ensure maximum benefit for the individual;

- Focus on outputs that improve competence and knowledge, a value-added approach

All three points made here raise questions for RICS professional education and the extent to which they are incorporated into its regulatory procedures.

CIC (2012) discovered that for some professional institutions CPD is monitored as an 'input' in units of time or points and under these circumstances the individual may lack motivation and often undertake poorly planned activities. Whilst the institutions set requirements for

membership, requirements for CPD should be clearly stated. The guidance recommended collaboration across the professions in CPD activities it also recommended a more prescriptive approach for CPD requirements. Concluding comments in the guidance document include a recommendation that CPD activities should be project-based and CIC consider that this would result in the following benefits:

Ensure better structured training for new entrants;

Helping with recruitment and retention;

Demonstrate the importance of improving business performance;

Encouraging a learning and feedback culture;

Encouraging cross discipline learning and development of team working skills;

Potential for CPD and competence to be a requirement in procurement and contracts;

Identifying where competence needs improving

These observations from CIC (2012) are recommendations only and the council did not establish through consultation whether their recommendations had been implemented by the built environment professional bodies. This research compares these observations with RICS training for quantity surveyors and evaluates where possible improvements could be made to the programme.

CPD aspects of the teaching profession was studied by Johnson (2014) and the term 'professionalism' which in teaching is synonymous with CPD. The research raises opinions that contrast with the generally accepted benefits of CPD and provides an insight that explains an alternative attitude of individuals to this source of professional knowledge. The requirement in teaching to undertake 'professional' development learning had exposed, in the majority, an impression that their employing organisation considered them to be deficient in professional knowledge. It was generally considered that the requirement for

CPD was driven by an external agenda of power and control. Government involvement in funding for education and the confused mixed messages of policy changes had developed in the professionals an impression that they had become the subject of experiment. The paper concludes by suggesting that more control and accountability undermines the independent, self-regulation ethos of the professional.

Palmer (2017) explores the current wider aspects of CPD and identifies developing trends in working and learning; increasingly education has become a continuum with working. However, there still prevails a trend that states 'get as much formal education as early as you can' in order to receive life-long career rewards. Those with college degrees expect to occupy the higher paid jobs and allegedly every extra year spent in formal education will increase rates of pay by 8 – 13%. Palmer (2017) found that, post-recession, a degree at the beginning of a career did not necessarily result in higher paid jobs. More recently it has become essential to replace established skills and techniques with new skills. An early career degree does not relieve the need for the continuous acquisition of new skills to address the demand of careers lasting many decades. This paper makes it clear that times are changing and a degree is not necessarily prerequisite for employers who are reluctant to recruit without experience. The burgeoning trend in continuing vocational education is a development that professional bodies in the built environment have recognised but not necessarily implemented. RICS has established a mandatory CPD requirement that has not changed since its introduction in 2010.

2.6.8. Mentoring

Professionalism was also discussed by Dean (2017) in relation to nursing and comments on guidance published by the Nursing and Midwifery Council. Observations made by Dean are equally relevant for professionals in the built environment. Pertinent for this research, the guidance identifies responsibilities for employers in supporting staff development. The responsibilities include:

Holding leadership roles;

Providing regular supervision;

Focusing on reflective practice;

Encouraging autonomous and innovative practice;

Providing appropriate staffing with the right skill mix and funding for training.

Mentoring is not formalised in RICS education and training for quantity surveyors, it is implied but not regulated. The role of Counsellor as part of the RICS Assessment of Professional Competence (APC) programme comes close to that of a mentor but, as previously observed in other situations, the role is often poorly understood and not taken seriously.

2.6.9. Practice Standards and Guidance

A document was produced by K. Galloway and Harris (2012) that was described as an audit tool which purported to provide practical guidance in assessing the level to which built environment education and training course content delivers what is necessary for the functions, expectations and levels of competence required by construction and the built environment sector. The document refers to National Occupational Standard (NOS) which have been developed by industry to establish its requirements, functions and areas of competence necessary for occupational performance. The report asks whether university/college is the best place to acquire knowledge about the functions of industry but does not assume that cognisance of NOS will ensure that graduates at degree level will be 'oven ready' for industry and the professions.

NOS cover the following built environment sectors:

Building development (including new build, extension, refurbishment and alteration);

Urban and rural development;

Infrastructure development;

Transportation;

Environmental development;

Building services engineering;

Landscaping;

Maintenance and conservation

The report does not reach a conclusion regarding professional education and training in the built environment disciplines and does not indicate whether the application of NOS is mandatory for industry and the professions. How widely NOS is referred to and used is also not addressed.

Education topics for professional, managerial and technical occupational groups were compiled into a 'Prevalence' score by Cracknell (2011) in a report for CIC. The topic headings were derived from National Occupational Standards (NOS). The six topics with the highest levels of prevalence were as follows:

Data gathering, research, investigation, consultation and analysis;

Information presentation and communication methods;

Policy and regulation requirements and implementation;

Contract forms, criteria and processes;

Resource and service supply requirements;

Construction technology, materials, methods and buildability

The report does not provide a definition for this prevalence nor does it clarify whether this is a ranked order of listing. Use of the word 'prevalence' does not confirm that these topics actually exist in professional education.

An interim report was published following a review of educational standards for professional engineers. The report made recommendation for standards and levels of education that should be set for accreditation. McGlothlin (1969) reviewed the report and identified the most radical proposal to be that engineering schools and the profession should require and designate a five year master's degree as the engineering first degree. Although most practising engineers anticipated graduate study in the future, the report committee concluded that a four year degree would not fulfil the requirements of professional competence and interestingly that of social understanding. Critics of the report suggest that a five year 'cramming' masters does not and cannot address a competency in analysis and synthesis including training in observation, critical enquiry and systematic problem solving. The critics refer to a world of tomorrow that recognises other aspects of human values and changes in behavioural patterns and values that should influence the development of professional education. To what extent these observations have influenced RICS professional education is the subject of this research evaluation.

Sweet (2015) commenting further on the report published by a government think tank called 'The Edge' observed that built environment education was the subject of a silo mentality and institutions should use their brands to market construction as a career choice. Qualifications should be used to attract a particular quality of entrant to the professions and industry using public feedback as a means of promotion. Many institutions adopted the title of 'learned societies' but the report found that this claim was often an empty special pleading and that an organised, specialist body of knowledge did not exist. The report suggested collaboration amongst the professions. Ali and Bradburn (2018), C. J. Baker (2007); Bligh (2005) in their papers made a connection between professionalism and

teaching through iterative acquisition of knowledge in the medical profession. Professionalism had previously been regarded as a 'hidden curriculum' whereby behaviours and attitudes would be mentored through role models demonstrated by other professionals. Ali and Bradburn found that current theory defined professionalism as a curriculum of communication, collaboration, management and professional and ethical behaviour. It is concerning that the findings of research into professional education may be lost and excluded from future programme development by the identified silo characteristic of professional organisations.

2.6.10. Artificial Intelligence

Artificial Intelligence (AI) is becoming increasingly linked to professional practice. Susskind and Susskind were part of the annual RICS Harris Lecture in London in November 2018 where the thrust of their presentation was the implications of AI for professional practice. The lecture concluded that AI was an inevitable development for the professions and a progression that required new professional skills in its application. Implications for the 'grand bargain' were not fully understood and it was suggested that this aspect of 'professionalism' may require to be revisited. Lester (2018) recognised that where practitioners are cognisant of technology, how it can free them from the more routine aspects of their work, analysis and diagnosis (which can be susceptible to error) to focus on higher-level aspects that include interpretation and options for problem solving practice. Schumpeter (2015) in an article in the business section of the Economist refers to the professions as stable elements in a turbulent world resisting crude forces which threaten steady and peaceful evolution. In contrast the article goes on to echo Susskind's prediction that machines are advancing the frontiers of knowledge in medicine and law and that artificial intelligence is in the ascendancy.

In an article for the British Medical Journal (*bmj*), Goldhahn (2018) makes reference to artificial intelligence (AI) that simulates human intelligence by learning, reasoning and self-correction with the potential to be more accurate than physicians. In 2017 a machine

passed the Chinese medical examination to the extent that it exceeded the minimum marks required by 96. AI may fulfil an augmenting role for the professions in the future but cognisance of its potential and the limitations of the human condition will be part of the developing role for the professions regarding professional knowledge. However Armstrong (2017) suggests that technology and access to information is often confused with knowledge. The process of education has reduced teachers to customer-service professionals and not people who have knowledge that their students do not. This has resulted in students having unrealistic grades and irrelevant qualifications that engender a fictitious perception of their own wisdom.

Recalling foregoing definitions, professionals have knowledge that those they help do not. Use of knowledge in the professions has been simply categorised in the following terms; know-who, which means who knows most in the organisation about a particular subject; know-what, technical knowledge; know-how, procedural knowledge; know-where, sources of help and guidance; know-why, rationale; know-when, timing issues that inform when to act and when to observe. Unfortunately the professions and professionals are reluctant to make contributions to the 'knowledge business' and the 'knowledge economy' professionals like to work in isolation and as others Sweet (2015) and Gardiner (2015) have stated, in silos. The cross-fertilisation of professional knowledge throughout the professions is seen to be in conflict with the culture of protectionism, special status, privilege and control. RICS as a prominent professional body in the built environment could benefit from the cross fertilisation of professional knowledge at the expense of protectionism.

2.6.11. Occupational Paradigms

Other changes in the paradigm of occupations have also influenced pathways to the professions and the decline of single-organisational careers and a more flexible approach to employment has prompted the move towards self-directed careers which require a greater need for self-management. Lester (2009) suggests that from the 1980s professional knowledge has embraced a more creative and reflective learning practices involving action

learning and critical action research which have been absorbed into the traditional technocratic paradigm. At the same time over the last 10 years there has been an increase in the use of practise assessment, either on an ongoing basis or iteratively to a conclusion and in some cases in support of a practice-based training period. Lester's study of 23 professions in 2009 found that there was an increasing diversity and flexibility for routes to becoming professionally qualified and also the study identified a move towards a more practitioner-centred aspect of professional knowledge but concerns still remained regarding the quality of practitioners at entry level being consistent with the demands of a risk society. Other educational trends have currently influenced the route to professional qualification and the burden of student debt has led to school-leavers being encouraged to pursue a professional qualification while in employment. This part-time professional education requires support from employers' and the Association of Certified Chartered Accountants (ACCA) currently recorded that 46% of its newly-qualified accountants had completed a non-graduate route.

This section of the literature review has explored the concept of professional knowledge. These concepts serve as a basis for a comparator with the policies that inform RICS education and training for quantity surveyors.

2.7. Professional Competence

This research explores the concept of competence to practice, particularly in relation to the work of chartered quantity surveyors. Set against issues of practice encountered in the current built environment market, the study assesses whether practicing professionals are sufficiently prepared to manage these issues. The following section provides an understanding of the concept of competence and the extent to which it is context specific. As part of the processes and procedures adopted by RICS in its programme of education and training for quantity surveyors, the expression '*competence*' is prevalent. '*Competencies*'

form the structure of the RICS Assessment of Professional Competence (APC) process and an understanding of what is generally accepted to be competence is a measure of relevance for RICS policies.

2.7.1. Current theory that explores competence

Current literature approaches the concept of competence through a disparate range of situations and circumstances and from this it is clear that any required level of competence lies somewhere on a continuum. Levels of professional competence are context dependent and it is therefore a responsibility for the presiding professional body to have cognisance for the implications of context in establishing the required level of competence.

Research that examined the Swedish motor industry provides an example of another means by which the required level of competence is established. Sandberg (2000) asserts that competence is defined as demonstrating the necessary knowledge and skills to successfully perform a task. Sandberg suggests that in order to organise and develop education and training for work occupations and practices, there needs to be an understanding of what constitutes human competence. The research described different approaches to competence in the Swedish motor industry and discussed '*worker-orientated approaches*' that identified the occupational skills demonstrated by workers, for example, knowledge skills, abilities and personal characteristics. Once identified, the skills are catalogued and matched with required tasks to be performed. This approach was found to produce generic results that were not context-specific. The '*work-oriented approach*' applied the same comparator but starting with the properties of the task to be performed and identifying functions that were considered necessary for the successful outcome of that task; from which a detailed specification is produced for what constitutes a competent worker, operative or practitioner. Sandberg is clear that competence is context-specific and the following structure is proposed as the key attributes of competence:

Optimising, separate qualities, interaction, customer perspective;

Knowledge;

Ability to analyse key performance indicators;

Optimise performance traits;

Ability to self-teach;

Ability to collaborate.

Sandberg concludes by stating that identifying what constitutes competence for any work function or practice remains a fundamental problem for management. The same problem is faced by professional bodies and particular for this research, RICS.

The implications of professionalism are addressed by Lester (2017) who suggests that definitions of professional competence should not be restricted to assumptions about the roles that practitioners might perform or the context in which practice takes place. Definitions should include reference to the ethos and ethics of the field and a wider consideration for professionalism. The article concludes that professional standards should be developed holistically throughout the sphere of practice rather than being relevant for particular specialisations, roles and particularly specific contexts. These recommendations embrace the nature of practice where practitioners make judgements relative to context and across different fields and professional roles; whilst recognising professional ethos and/or responsibility and good practice as required by the task in hand. A description of competency standards should provide for contextual interpretation, recognition of social expectations but at the same time be cognisant of individual practitioner differences.

The continuum upon which any defined level of competence exists is raised by Eraut (1998) by explaining that the word 'competence' has a variegation of meanings and interpretations as does 'knowledge', 'skills' and 'ability'. Eraut (1998) addresses the meaning of

'competence' in considering the relationship between professionals and the public. Qualified and competent may be taken to mean the same and the public expectation is that qualified practitioners are competent. Another more literal interpretation represents competent to mean 'adequate but less than excellent' which places the meaning of competent in a continuum. The professions therefore have a dilemma of placing 'competent' and 'a competency' within a scale of 'minimum competence' and 'excellence'. Eraut offers a broader definition that sits conveniently within the 'grand bargain' and public image by using the phrase: *'the ability to perform the tasks and rules required to the expected standard'*. A term that could be taken to imply 'reasonable skill and care' when considering matters of alleged negligence. A meaning of competency in carrying out more regular tasks may be preferred to excellence if the outcome was a quicker and cheaper service. RICS standards of competency and the occurrence of practice problems and conflict in construction may have a relationship that demonstrates 'adequate but less than excellent'. This research asks whether RICS 'adequate' is relevant to address practice-based problems encountered in the current built environment market.

A competency that recognises the needs of business and commerce in relation to the work of a professional engineer is considered by Kavanagh (2004) who reviewed proposed new standards applicable to becoming a chartered or incorporated engineer. The changes were in response to pressure from employers and engineers for more flexibility in obtaining professional status for candidates who do not hold accredited educational qualifications but can offer 'appropriate' work experience. The traditional status of a profession is established by educational standards prescribed by the level of entry to the profession, most frequently a university degree. The importance of competence is referred to as a means to assess the contribution professional engineers and technicians *can* make to the economy. Kavanagh (2004) in his review noted that the new standards stated that engineering competence must react to the needs of business and industry, which belies the question of what are the needs and standards required by business and industry. The proposed widening of entry levels, for

this profession, appears to be in conflict with the stated demands of increasingly complex technology, risk to the environment and creating sustainable development. A dilemma faced by RICS in its governance of entry levels to the profession.

Lester (2014) looked at the various concepts of competence as a basis for establishing standards of professional practice. This is a sensitive area of governance for professional bodies because it is the level at which members are signed off as being fit to practise; together with a continuing obligation to remain competent. The concept of “able to do” varies between prescription and interpretation, that is, between the skill and expertise of the individual and the level of performance required to successfully complete the task. The aspect of interpretation is a subjective variable in setting standards of professional competence. The International Standards Organisation (ISO) definition of competence is “ability to apply knowledge and skills to achieve intended results” which underscores the variable of interpretation. The professions require competency standards for assessment at the point of registration or admission as a qualified member and subsequently the status of fellowship. This research project asks whether RICS education and training for quantity surveyors is set at a level of competence relevant for the current demands of industry in the built environment.

The need for professional competence is explained by Koskinen (2003) stating that professionals require competence to implement a task and he suggests that competence can consist of three parts, tacit knowledge, personal characteristics and explicit knowledge, all influenced by context. Lester explores the concept of ‘capability’ which is also about being ‘able to do’ but concludes that capability is more difficult to define and could be placed in the category of “I know it when I see it”. An examination of meaning for these words and phrases relative to competence, illustrates how important and difficult it is to establish a correct level at any point in time. RICS, as the body that represents the surveying profession has accepted this responsibility as part of the ‘grand bargain’. Beedel (2016)

referring to the trade bodies representing the electrical installation industry, identifies that collaboration between the various representative bodies and consumer safety interests have set standards which have recognised and defined technically competent practice standards. The relevant conclusion from this trade body appears to be collaboration.

2.7.2. RICS and levels of competence

The RICS Assessment of Professional Competence (APC) programme as part of RICS education and training for quantity surveyors sets out a definition for the level of competency required to be attained by candidates seeking to become qualified to practise. The quantity surveying functions referenced in the APC programme are referred to generically by RICS as APC competencies. Hence the word competence is used extensively in the documentation that provides guidance for candidates through the APC process. Eraut (1998) believes that the word 'competence' is, in some cases, used rhetorically without due consideration for policy objectives and the type of problems to be addressed. The reality of practice provides many different problems and scenarios to be addressed competently by quantity surveyors.

RICS Assessment of Professional Competence (APC) programme, by definition, uses the word competence throughout its guidance documentation and standards. The Oxford English Dictionary defines competency as '*.....sufficient in amount, quality, or degree*'. Eraut (1994) suggests that it could mean '*getting the job done*' or less positively '*adequate but less than excellent*'. C. Lee, Perera, and Hogg (2012) define competency as an action, behaviour or outcome which a person should be able to demonstrate or the ability to transfer skills and knowledge to new situations within an occupational area. Moore, Cheng, and Dainty (2002) explain that competency can be defined as the ability and willingness to perform a task or an underlying characteristic of a person which results in effective and/or superior performance in a job. This research evaluates how RICS has defined competence in its policies for educating and training quantity surveyors.

Chartered quantity surveyors are confronted with a wide range of circumstances, scenarios, issues and matters of conflict and dispute in the course of practice. The level of competence demonstrated by practitioners may be inversely proportional to the financial consequences of these practice-based issues. Dispute and conflict in construction is recognised as being endemic and increasing with the associated financial risk for public and private clients, contractors and the dependent supply chain (Allen (2013) Rogers (2019)). This research investigates to what extent RICS education and training for quantity surveyors prepares the practitioner to deal with these issues and whether RICS has acquired sufficient cognisance for these matters in setting a level of competence appropriate for practice.

RICS, in its APC process and procedures defines the required competency at three different levels applicable to prescribed quantity surveying functions which are referred to in the documentation as '*competencies*'. The three levels are defined by RICS as follows:

Level 1 – knowledge and understanding

Level 2 – application of knowledge

Level 3 – reasoned advice, depth and synthesis of technical and its implementation

Applicants for full membership of RICS are assessed against the required competency levels for each prescribed quantity surveying function ('*competency*') by a panel of three chartered surveyors through the course of an interview lasting one hour. Structure and content of the interview are discussed in more detail later in Section 3.5.3 of the following chapter. However, the salient point raised here recognises that the assessment of competency in the RICS APC process is a subjective view reached by members of an assessing panel.

2.8. Summary of the Chapter

Society in the UK continues to be influenced by the practice of professional members from the professions that exist within the UK built environment. The level of expertise and competence demonstrated by professional members is the result of their knowledge and practice skills. This chapter of the thesis has examined the professions as a concept and has discussed their relationship with professional knowledge and how it is acquired. A definition of competence is addressed through current literature as a comparator with the procedures and requirements that exist for quantity surveyors wishing to become full members of RICS and as such chartered surveyors. The chapter also explored the responsibilities of the professions and how adherence to these obligations impact upon the realities of practice for chartered quantity surveyors.

3. LITERATURE REVIEW – QUANTITY SURVEYING AND RICS

3.1. Introduction

The purpose of this chapter is to introduce the profession of quantity surveying, its history, practice functions and traditions of professional knowledge acquisition. The early sections of the chapter provide a background and professional context for the thesis to assist the reader in understanding matters of professional practice to be raised subsequently in support of the research argument. Reference to the professional practice of quantity surveying, unfortunately, often engenders a feeling of quiescence in those who do not possess an understanding of its characteristics or its value to society. However, as sits unglamorously behind the more visual aspects of construction, development and real estate in the UK built environment its professional assets are only apparent to those within the industry. The chapter introduces RICS and its history together with an explanation of current policies and procedures for professional education and training of quantity surveyors. In conjunction with the previous chapter this chapter establishes the field in which this research is situated.

3.2. History and development of the quantity surveying profession

The critical review commences by introducing a lighter note of reference that finds the profession in a state of introspection. In the early 1990s the RICS Quantity Surveying Think Tank produced a report, *'Questioning the Future of the Profession'* which included evidence that many within the construction industry thought that chartered quantity surveyors were: arrogant, friendless and uncooperative. They were perceived to add nothing to the construction process, failed to offer services that clients expected as standard, and too few had the courage to challenge established thinking. At the same time a report by the University of Coventry also concluded that quantity surveyors 'are arrogant and lacking in interpersonal skills'.

Commencing from this low point in the perceived persona of the chartered quantity surveyor, this section of the literature review explains how the profession emerged from the circumstances created by major events in history. Cartlidge (2011) considers the quantity surveyor to have been an integral part of the UK construction industry for over 200 years dating back to the Napoleonic wars which, as stated previously, created a demand for army barracks that could be transported across the channel. The need was so urgent that contracts for construction were let on a '*settlement by fair valuation based on measurement after completion of the works*', hence the requirement for skills in measurement and valuation of construction work, which became the core skills of quantity surveying. However, reaching further back in time, others, A. Ashworth and Hogg (2008) believe that quantity surveying began with the Great Fire of London in 1666 and the growth of single trades, contracting for their own particular part of the rebuilding work for the city and each trade requiring a measure and value service. These references confirm that the profession of quantity surveying has been providing a service to business, commerce and the UK government for some considerable time. The traditional skills of a quantity surveyor have long been a part of the range of specialist expertise offered to the public and industry by a profession in the UK built environment. The profession of quantity surveying has therefore become well established in society and as such has developed a prominence in construction and the creation of real estate assets.

Seeley and Winfield (1999) describe how the quantity surveying profession has developed over the last century and has now evolved into the second largest sector or specialisation in the membership of RICS. The earliest quantity surveying firm is identified as existing in Reading in 1786 and the first method of measurement was produced in 1802. The early custom and function of the quantity surveyor, as stated previously, was to measure and value building work after it had been completed. In the seventeenth century architects designed buildings and were also responsible for the construction work. Master craftsmen were employed to perform the work of each trade and it became the custom for master

craftsmen to engage 'surveyors' or 'measurers' to prepare their accounts for payment. The practice evolved from a number of surveyors preparing conflicting accounts of measure and value, to one surveyor who prepared an accurate bill of quantities and measured and valued any variations that arose during the progress of the project.

The publication of the first method of measurement in 1802 signifies very early example of codified practice knowledge and practice standards for quantity surveyors. The first edition of the more formal document, which was more familiarly entitled, Standard Method of Measurement was issued in 1922 by RICS and the Building Employer's Confederation. The document provided a uniform method of measurement based on the practice of leading London quantity surveyors. It established generic rules of measurement that enabled the pricing of construction work to be compared on a like-for-like basis. Further editions were produced in 1927, 1935, 1948, 1963, 1968, 1978, 1988 and a revised edition of SMM 7 was issued in 1998. SMM7 has now been superseded by the New Rules of Measurement (NRM). Seeley and Winfield (1999) believe that these developments remain the essence of quantity surveying today.

Britain pioneered the development of the quantity surveying profession and Seeley (1997) identifies how it has spread to over 120 countries around the world. He considers that a qualified quantity surveyor receives high professional standing from years of study, training and experience. D Cartlidge (2002) also catalogues the development of quantity surveying as the profession attempts to address the changing trends in design and construct procedures and processes, in contrast to a far less complicated industry of the 1960s where the quantity surveyor was considered to be a mainly back office operation, providing a limited range of services. In 1971 the RICS produced a report entitled '*The Future Role of the Quantity Surveyor*' in which it concluded that the quantity surveyor was primarily a producer of Bills of Quantities and that the distinct competence of the quantity surveyor of the 1970s was measurement, in a time when design and construct projects were rare. Male

(1990) defines quantity surveyors as either building economists, construction cost consultants or resource managers who contribute to capital asset formation. He suggests that the quantity surveying owes its existence to architects who out-sourced the measurement function of contract administration leading to the development of specialised skills and a separate profession.

The need for specialist skills were evidently required and Seeley (1997) describes how the construction industry developed employing a wide range of loosely integrated organisations to construct, alter, refurbish and repair a variety of building and civil engineering structures. Stakeholders to a construction project have developed from a single architect for design and a single contractor employing all trades to a range of specialist designers and a main contractor employing specialist subcontractors. 1991 highlighted the rise in specialist subcontracting and the shift of general contractors from building to management and coordination and the extension of their role into design and management of the construction process, as opposed to the traditional contracting approach of directly employing all the trades necessary to carry out the work.

Developments in design and product innovation saw other construction methods that complimented the extensively used traditional trades of concrete, brickwork and carpentry. The range of building clients included central and local government, housing associations and private organisations requiring industrial, commercial and accommodation real estate assets. Construction techniques have developed rapidly in response to market trends and economic pressures. The client, in commissioning an important building or engineering project, is faced with the key problem areas of construction cost, construction management and construction communication. Seeley (1997) considers the quantity surveyor is professionally trained, qualified and experienced in dealing with these problems on behalf of the employer but does not provide evidence that these assumptions are, in reality, correct.

The work of a quantity surveyor is further explained by A. Ashworth and Hogg (2008) using the RICS definition of *'The Future Role of the Quantity Surveyor'* they refer to; *'ensuring that the resources of the construction industry are utilised to the best advantage of society by providing, inter alia, the financial management for projects and a cost consultancy service to the client and the designer during the whole construction process'*. The golden age for quantity surveyors may be thought of as the period between 1950 and 1980, when bills of quantities were the preferred basis for tendering documentation and RICS scales of fees were generous and unchallenged. However, in this golden age, D Cartlidge (2002) identifies a draconian rule from the 1960s that forced chartered surveyors to resign from RICS if they chose to work for contracting organisations.

In the late 1970s a new type of construction client emerged with the Conservative government embarking upon an energetic and extensive campaign of privatisation in the public sector that heralded the introduction of the Private Finance Initiative (PFI). D. Cartlidge (2011) suggests that this development brought about the emergence of major private sector clients, more knowledgeable about construction and not prepared to accept the UK construction industry allegedly under-performing. Construction projects procured using PFI became larger and more complex and as a result required new skills from the quantity surveyor. Financial management, procurement and the administration of a supply chain became dominant functions for practitioners working on both sides of the contract. Whilst measurement and valuation remained important functions of practice the quantity surveyor's skill-set needed to broaden.

Others recognised the expanding role of a professional quantity surveyor and R Nkado and Meyer (2001) suggest that professional quantity surveyors offer a particular service to the built environment providing a combination of other disciplines including economics, law, accountancy, management, measurement, information technology and construction technology. S. Lee, Trench, and Willis (2011) define the services provided by the modern

quantity surveyor as covering all aspects of procurement, contractual and project cost management which all evolve from the traditional ability to measure and value. Regarding the measurement of a building project at the various stages from feasibility through to final account, Lee observes that measurement and value establish the contract sum and the amount to be paid to the contractor. D. Turner, F. (1983) identifies that with the pace of the quantity surveying profession speeding up, clients now expected advice for decision making and not just a skilled backroom service that mysteriously produced project documentation out of the hat without assistance or consultation.

The traditional practice functions of measurement and valuation are identified by Ramus (1981) when referring to all aspects of the quantity surveyor's professional duties relating directly or indirectly to the cost of construction work of all kinds including costs incurred after the completion of the construction phase. Ramus also states that quantity surveyors need to have a detailed knowledge and understanding of the provisions in standard forms of contract. He suggests that most surveyors have acquired considerable expertise in the use of standard forms and as such the quantity surveyor has a quasi-judicial role in administering standard forms. These research observations are in the form of statements of fact that provide a menu of quantity surveying skills that should be in place. However, the research does not clarify whether in reality these skills are evident in practice situations.

The requirement for a broader skill-set from quantity surveyors, referred to previously, is also recognised by Male (1990) who states that professional practice is formulated into rules, codes of practice and written procedures but Male considers quantity surveying to be a profession of generalists with considerable emphasis on experience and a practical base. It is suggested that quantity surveyors earn their fees from the production of bills of quantities and the settlement of final accounts. However, Male (1990) observes, more recently, that the quantity surveyors role has expanded into areas such as economic management of

construction and heavy engineering projects, production and resource control, cost engineering, financial control of civil engineering projects, mechanical and electrical services, strategic planning, project management, value management and the management of contracting organisations. Therefore quantity surveying services can be procured by the client throughout the building process and applied in a variety of different commercial contexts. Male states that the services provided by the quantity surveyor are 'middle range' to 'end range' of the building process and in these measurement and codified procedures are used to maximum effect.

Literature in the field of quantity surveying, as explained previously, clearly identify its practice functions, role and the knowledge and expertise required to carry that role. In the 1950s quantity surveying practice primarily involved preparing bills of quantities and preparing and agreeing final accounts. Subsequently as construction and procurement methods became more complex, accordingly so did the role of a quantity surveyor. Scholars have been able to identify changes in the construction process and surmise the new skills required by the practising quantity surveyor. The extent to which these new skills and expertise is evident in practice is part of the conceptual framework for this research.

3.3. Traditional professional education for quantity surveyors

In the 1960s as a trainee quantity surveyor the author acquired professional knowledge through a combination of work experience in work-place practice and weekly day-release at a technical college providing an RICS accredited course in preparation for the RICS written examinations. The core subject areas at that time were Measurement, Building Technology and Law. Seeley (1997) expands on the author's reflection and states that the principle methods of study for the examinations of RICS in the 1940s, 1950s and early 1960s were by correspondence course, day release at a local technical college or possible a combination of the two, together with work-based training in a quantity surveying office. Study by the part

time route was often a lengthy, hazardous and exacting process with many imperfections. The combined pressure of full time employment and part time study were very great and the subject areas covered in employment could not possibly embrace all those contained within the RICS professional examination syllabus. For those embarking on this pathway, satisfactory integration of theoretical study and practical work was difficult to achieve.

The combination of full time work in practice and part-time education was indeed exacting and experience gained in the work place was often uncoordinated with the curriculum of RICS college courses. Professional development in the work place was also arbitrary and subject to the characteristics of senior colleagues. Mentoring for candidates by senior professionals was a hit-and-miss at best. Seeley (1997) continues by explaining that later developments introduced full time courses for professional examinations and external degrees and subsequently diploma courses approved by the RICS. The late 1960s and early 1970s saw the introduction of quantity surveying degree courses in universities and the former polytechnics. Entry requirements were raised to two GCE 'A' levels and the availability of degree courses throughout the country would in time form the principal method of entry into the profession. The mid-1980s and the mid-1990s saw the advent of mass higher education and the upgrading of polytechnics to universities which established education for the profession in Britain.

Further developments in education and training for quantity surveyors were implemented in the late 1980s and D. Cartlidge (2013) explains how the RICS moved away from setting examinations to one of an accrediting body, the present path to professional qualification emerged and a partnership scheme with selected universities was adopted. The principle aims of the partnership were to:

- Maintain standards;
- Attract the best entrants to the profession;
- Promote research;

Develop courses in response to the needs of the profession and industry;
Improve education/professional links.

On completion of the first degree the graduate enters a structured training framework over a minimum of two years leading to the Assessment of Professional Competence (APC) which is designed to ensure that those applying for membership are competent to practice.

In summary for this section of the literature review of traditional RICS education and training for quantity surveyors, Ashworth and Hogg (2007) provide a useful chronology of developments within that progression. Higher education became the chosen partner for RICS which in turn established a clear academic level for membership that enhanced the status of the profession. RICS and the universities have remained in this mutually beneficial partnership to this day. Ashworth and Hogg (2007) produced a chronology that charted the development of RICS education and training for quantity surveyors as follows:

The 1960s – day release or correspondence courses for Institution’s examinations.
Introduction of full-time exempting quantity surveying diploma courses.

The 1970s – 30 polytechnics formed in 1970. Development of full-time degree courses.

The 1980s – part-time degrees replace diplomas and external examinations. Quantity surveying courses mainly sandwich and part-time.

The 1990s – polytechnics become universities. Continuing Professional Development for all surveyors. Continued role of accreditation in the UK.

The 2000s – university partnerships established with the RICS.

Development shown here demonstrates the increasing involvement of academy in the knowledge acquisition of quantity surveyors. Professional reflection by the author informs that through the late 60s and mid 70s quantity surveying practice became more confrontational as contractors and clients were subject to a wildly fluctuating economy, as recognised by Seeley (1997). The purpose of this section of the chapter is to provide an

understanding of how the programme of knowledge acquisition for quantity surveyors attempted to develop and adapt to the needs of industry and commerce as economic factors and market conditions became increasingly challenging for both clients and contractors. The extent to which education and training for quantity surveyors continued to keep pace with the demands of market trends, the economy and commercial customs in the industry, is evaluated by this research.

3.4. Royal Institution of Chartered Surveyors (RICS)

This research is focused on the policies and procedures of RICS with regard to its programme of education and training for quantity surveyors. The history and background to RICS is provided here to assist in understanding the scope and parameters of its chosen procedures to achieve, what is considered by RICS, to be the required level of professional competence to practice as a Chartered Quantity Surveyor.

The RICS motto:

'est modus in rebus'

(There is measure in all things)

RICS describes itself as being *'the mark of property professionalism worldwide'* and as such claims to be part of the current global built environment market. A Ashworth and Hogg (2007) suggest that in terms of their market situation, the professionals can be divided into two groups: the higher professionals and the other professionals. The higher professionals include accountants, lawyers, doctors, university lecturers as well as chartered construction professionals. This research therefore places chartered members of RICS somewhere in the field of higher professionals, which accords with RICS's own image of itself, as stated above. This section of the thesis continues with an account of the development of RICS and begins with a quote used by the institution to introduce professional surveying from the words of classical literature.

*'When we mean to build,
We first survey the plot,
Then draw the model,
And then we see the figure of the house,
Then must we rate the cost'.*

Shakespeare, Henry IV, Part 2, Act 1, Scene III

RICS (2014)

RICS states in its current prospectus, RICS (2015b) that it can trace its history back to 1792 when the Surveyors Club was formed. In 1868 the club became the Institution of Surveyors responding to the rapid development and expansion of the industrialised world as infrastructure, housing and transport links grew. The Institution was incorporated by Royal Charter in 1881 and amalgamated with the Institute of Quantity Surveyors (IQS) in 1983. It now supports 140,000 members with the designation of chartered surveyor. RICS describe specialisations within the institution as Faculties of which there are 22. Faculties comprise the current professional structure of RICS and Quantity Surveying and Construction is one of the larger faculties with 23,000 members (Strong (2016). Seeley and Winfield (1999) describe how the quantity surveying profession has developed over the last century and they also recognise that it has now evolved into the second largest faculty or specialisation in the membership of RICS. Quantity surveying emerged publically in the eighteenth century and the earliest quantity surveying firm is identified as existing in Reading in 1786 followed by publication of the first method of measurement in 1802.

The royal charter granted to RICS places the institution in a position of eminence and status. A royal charter is a formal document issued by the monarch as *'letters patent'* that bestows a right or power to a body corporate and establishes within society significant organisations or learned societies which have a solid record of achievement and are financially stable. A royal charter is sought as a recognition of pre-eminence, stability and permanence in representing a field of activity. The Royal Charter RICS (2015c) granted to the Institution of

Surveyors in 1868 prescribed that the objects of the Institution shall be to secure the advancement and facilitate the acquisition of that knowledge which constitutes the profession of a surveyor, namely, the arts, sciences and practice of (amongst others):

- Item (g) determining the economic use of resources of the construction industry, and the financial appraisal, management and measurement of construction work; (Quantity Surveying)
- Maintain and promote the usefulness of the profession for the public advantage in the United Kingdom and in any other part of the world. RICS Royal Charter and Bye-Laws (updated January 2009).

RICS, by applying for and receiving the status of a 'chartered' body has agreed to the responsibilities stated in the foregoing. This research examines the extent to which RICS facilitates the acquisition of knowledge through its procedures and processes for educating and training quantity surveyors to the extent that they are able to practice competently in the current UK built environment market. The review of existing literature has explored the concepts of professional knowledge and professional competence which will be referenced in assessing the relevance of RICS education and training for quantity surveyors in relation to current issues of practice.

3.5. RICS education and training for quantity surveyors

This section of the chapter considers the current programme of professional education and training for quantity surveyors designed, administered and regulated by RICS. It explores the way in which quantity surveyors are expected to acquire knowledge and skills that are considered constituents of all that is necessary for competence to practise and to become a chartered member of RICS. The research looks at how the profession has established a pathway which is designed to prepare candidates for post-graduate practice in the industry. A review of current RICS guidance and standards provides an understanding of the education and training process, including details of subject matter, levels of competence

required and assessment procedures. The section concludes with reference to current literature in the field that has studied RICS professional education and training for quantity surveyors. This research by others identifies a range of skills and expertise considered necessary for quantity surveyors to be able to practise competently in the face of an ever changing construction industry.

3.5.1. The development of RICS education and training for quantity surveyors

The professional quantity surveyor has traditionally been educated to practise from pathways devised, developed and accredited by RICS. When addressing matters regarding the administration of construction and engineering works and the traditional role of the quantity surveyor in the UK built environment, RICS is one of the most prominent bodies of knowledge and source of standards for professional competence and expertise. Whether the level of knowledge and understanding deemed necessary by RICS for practising quantity surveyors suitably equips the practitioner for the rigours of front line practice, at times, in a quasi-judicial role, is speculative. This doctoral research evaluates whether RICS needs to recognise the extent of developing trends in construction, the demands of current construction practice, procurement routes and changing forms of contract, in order to improve its professional education and training, professional standards and the status of the quantity surveying profession. Quantity surveying practitioners in the UK built environment face difficult and high risk issues when making decisions in the role of managing and administering construction projects. The following review investigates how RICS design their education and training and whether it provides the knowledge and skills necessary for current market conditions in construction.

In 1994 RICS produced a most comprehensive and forward looking education policy entitled '*A Strategy for Action*' based on the needs of employers. Seeley (1997) identified that this brought about the development of a wide spectrum of academic courses ranging from the highly academic to those which were broadly based with a significant input of business

awareness and relatively low surveying content to those with a more traditional, technical, vocational base. Such a spectrum of courses would enable potential employers with widely varying needs to recruit what they perceived to be the most relevant types of graduates. The contents and characteristics of quantity surveying degree courses in the UK were explored by Seeley (1997) and he identified that there was a wide variation in emphasis on the seven main subject areas in the degree curriculum. For example an analysis of course content determined that measurement varied from 0 to 25 per cent of the total, construction economics from 5 to 16 percent of the total, management from 5 to 16 percent of the total and technology from 11 to 39 percent of the total, however in considering these statistics some courses were designed for a specialist market. The seven main subject areas of quantity surveying degree courses: were, at that time, measurement, construction economics, economics, law, construction law, management and technology.

These developments indicated that there was a belief that traditional quantity surveying skills were no longer consistent with the needs of the profession. The quantity surveying degree courses available at that time conformed to what was considered to be education for quantity surveyors that responding to the needs of practice and industry. A Latham Report working party in 1994, Latham (1994) proposed the integration of common subjects to be taught to mixed groups of architects, engineers and surveyors which reiterated a recommendation for more shared knowledge of the design and construction processes with cross fertilisation between disciplines adopting unified courses in the early stages of higher education.

In the early 1990s the route to becoming chartered involved the Test of Professional Competence (TPC) which reflected considerable variation in the apparent level of involvement by employers in the training of candidates. TPC involved candidates completing a two day practice problem, test of competence at their place of employment. The quality

of experience demonstrated by candidates had a direct influence on the final pass rate, which was invariably thought to be too low. In 1994 the TPC was replaced by the Assessment of Professional Competence (APC). Under the APC scheme the employer is expected to provide the candidate with the required programme of training and experience, to give encouragement and to make the necessary time and facilities available in support of the programme. The extent to which an employer provides support for the candidate is not regulated by RICS.

In 1998 RICS issued a report, *'The Challenge for Change'* which was drafted at a time when the business climate was driven by Information Technology (IT) and clients were demanding added value from quantity surveyors. The report also predicted that the distinction between contracting and professional service organisations would blur. Subsequently *'The Agenda for Change'* was written as a Presidential address in 1998 by the then President Richard Lay and it attempted to review every aspect of the surveying profession and found that the status of the profession was in decline. Membership was then 74,000 with 80% of corporate membership being Quantity Surveyors and General Practice Surveyors. The President recognised that the profession could not demonstrate an *'added value service'* comparable with other professions and controlling entry would build the profession for the future RICS, (1998). The RICS revised its accreditation policies and A Ashworth and Hogg (2007) identified that these were replaced with partnership arrangements introduced in 2001. The new partnerships required universities to stipulate a points scores grading for GCE A-Level passes for entrants. Teaching Quality Assessment for staff and monitoring the employment destination of graduates.

R Nkado and Meyer (2001) subdivided competencies into occupational competencies which are those that are necessary for an individual to perform in a particular occupation or role; and vocational competencies which refer to the technical competencies required to perform according to standards required by a job or occupation. RICS state that the distinctive

competencies or skills of the quantity surveyor are concerned with measurement and valuation which provided the basis for proper cost management of the construction project. These skills are the foundation of forecasting, analysing, planning, controlling and accounting; in summary the financial and contractual control of the building project. Occupational competencies include people skills, communication skills, teambuilding, negotiating, management and client care.

3.5.2. RICS current education and training for quantity surveyors

RICS published an APC Candidate Guide RICS (2019) which explains the APC process. The guide states that a range of academic and professional qualifications, combined with the appropriate experience, establishes the skills and levels of competence necessary to become a chartered surveyor. RICS defines entry requirements to begin the APC process as follows:

RICS accredited degree and at least 24 months of structured training and a minimum of 96 hours Continuing Professional Development (CPD).

Or, RICS accredited degree with a minimum of 5 years relevant experience, at least 12 months structured training and a minimum of 48 hours CPD.

Or, RICS accredited degree with a minimum of 10 years relevant experience and a minimum of 48 hours CPD over the preceding 12 months. No structured training period required.

Or, Bachelor degree (or membership of an RICS approved professional body) with a minimum of 5 years relevant experience (at least 12 months must be post qualification). Successful completion of the preliminary review and a minimum of 48 hours CPD.

RICS state that its APC programme is more concerned with training than education and it is now widely accepted that training is only effective '*on the job*'. A Ashworth and Hogg (2007) identify that in 2000 the RICS introduced the need for all APC candidates to be employed in an organisation having a structured training framework or a competency achievement plan.

The RICS APC Candidate Guide RICS (2019) states that each candidate requires a Counsellor, a member of the RICS, who attests that the required level of competency has been achieved for the chosen pathway. Each candidate must have a Supervisor, who is not required to be a chartered surveyor, but who mentors day-to-day activities, providing guidance and support through structured training. However, in reality, the candidate's Counsellor and Supervisor are both untrained in the role and unregulated to a standard by the RICS, but are required, none the less, to sign-off levels of competency prior to a final assessment interview.

Specialisations within RICS are called Faculties which in turn have a defined APC pathway which candidates can choose to follow. Quantity Surveying and Construction is one of these pathways. The RICS states in the current Candidate Guide that to be competent to practise as an RICS member, candidates must demonstrate the skill and/or ability to complete a variety of tasks and functions, some based upon attitudes and behaviours. The competencies for each pathway are categorised as follows:

Mandatory competencies: personal, interpersonal, professional practice and business skills common to all pathways and compulsory

Technical competencies split into:

Core competencies: primary skills for the chosen pathway

Optional competencies: selected as additional skill requirements for the chosen pathway from a list of competencies relevant to that pathway

Each competency is defined at three levels of attainment:

Level 1 – knowledge and understanding

Level 2 – application of knowledge and understanding

Level 3 – reasoned advice, depth and synthesis of technical knowledge and its implementation

Candidates are required to keep a record of structured training amounting to 400 hours over a two year period and a record of experience together with the completion of

minimum 48 hours CPD per year. Each pathway defines what is required to be developed and submitted for final assessment which involves a ten minute Case Study presentation included within an interview lasting one hour conducted by three chartered members of the RICS. The final interview is designed to assess whether the required level of competencies have been achieved for full membership (MRICS).

The RICS Assessment of Professional Competence APC Requirements and Competencies RICS (2018d) states that the Quantity surveying and construction pathway requires the candidate to select a particular field in which to demonstrate competence:

- Civil engineering
- Construction
- Mechanical and electrical installations
- Oil / gas installations
- Petro-chemicals
- Railways

Mandatory competencies for all pathways are as follows:

Level 3 – Conduct rules, ethics and professional practice

Level 2 – Client care; Communication and negotiation; Health and safety

Level 1 – Accounting principles and procedures; Business planning; Conflict avoidance, management and dispute resolution procedures; Data management; Sustainability; Team working.

The Quantity Surveying and Construction pathway requires competencies to be attained at the following levels:

Core Technical competencies: to Level 3;

- Commercial management of construction **or** Design economics and cost planning
- Contract practice

Construction technology and environmental services
Procurement and tendering
Project financial control and reporting
Quantification and costing of construction works

Optional Technical competencies: to **Level 2** – the choice of two competencies required from the following list:

Building information modelling (BIM)
Capital allowances
Commercial management of construction **or** design economics and cost planning
(whichever is not selected as a core competency)
Conflict avoidance, management and dispute resolution procedures **or** Sustainability
Contract administration
Corporate recovery and insolvency
Due diligence
Insurance
Programming and planning
Project evaluation
Risk management

3.5.3. RICS APC final assessment interview

The Final Assessment Interview is prescribed by the RICS to last one hour and the interviewing panels sit in the spring and autumn of every year at five centres in the UK. Each panel comprises a Chairperson and two Assessors who are all practising Chartered Surveyors. RICS guidelines, RICS (2019) provide a timeline for the hour long interview. The Assessors ask the candidate questions relating to the Mandatory and Technical competencies and the Chairperson asks the candidate questions regarding Conduct rules, ethics and professional practice. Each Assessor has 13 minutes to ask the candidate questions regarding their stated competency levels for 4 Mandatory competencies and 4

Core/Technical competencies. The interviews are audited to an RICS standard by chartered surveyors who are independent from the questioning process. This research speculates whether candidates can be properly assessed competent to practise across 8 competencies in 13 minutes of questioning. However, the pass rate for Quantity Surveying and Construction candidates who sat the Spring 2017 assessments was 56% which translates into 165 new chartered quantity surveyor members, (RICS (2017)).

A Quantity Surveying and Construction candidate could typically be questioned by the interviewing assessors and the Chairperson on the following competencies:

(The RICS definition of each competency at the stated level required are in parentheses) RICS Assessment of Professional Competence APC Requirements and Competencies, RICS (2018b)

Mandatory competencies

Level 1 *(knowledge and understanding)*

Accounting principles and procedures

(Demonstrate knowledge and understanding of accounting concepts and the format and preparation of management and company accounts, including profit and loss statements, cash flow statements and balance sheets)

Conflict avoidance, management and dispute resolution procedures

(Demonstrate knowledge and understanding of the techniques for conflict avoidance, conflict management and dispute resolution procedures including for example adjudication and arbitration, appropriate to your APC pathway)

Team working

(Demonstrate knowledge and understanding of the principles, behaviour and dynamics of working in a team)

Level 2 *(application of knowledge and understanding)*

Client care

(Provide evidence of practical application of the principles and practice of client care in your area of practice)

Communication and negotiation

(Provide evidence of practical application of oral, written, graphic and presentation skills that are appropriate in variety of situations)

Level 3 *(reasoned advice and depth and synthesis of technical knowledge and its implementation)*

Ethics, Rules of Conduct and professionalism

(Provide evidence of application of the above in your area of practice in the context of advising clients)

Core competencies

Level 3 *(reasoned advice and depth and synthesis of technical knowledge and its implementation)*

Commercial Management

(Monitor, report and advise on project cash flow and profitability: evaluate and advise on the financial implications and appropriate management action)

Design economics and cost planning

(Give strategic and reasoned advice, including the preparation and presentation of reports with reference to cost, time, quality and buildability. Advise on various market factors and trends in construction costs. Comment on accuracy and risk)

Contract practice

(Provide evidence of reasoned advice, prepare and present reports on the selection of the appropriate form of contract and warranties for your chosen procurement route. This should include advising on the most appropriate contractual procedure at the various stages of a construction or other contract)

Construction technology and environmental services

(Advise on the selection and application of particular processes within your area of experience. This should include liaison with specialists and consultants to develop project specific design and construction solutions)

Procurement and tendering

(Give reasoned advice on the appropriateness of various procurement routes. Manage the tendering and negotiating process and present reports on the outcome)

Quantification and costing of construction works

(Advise on appropriate methods of quantification and costing for specific projects. Take responsibility for preparing and issuing pricing documents. Price or analyse such documents. Give advice on and/or supervise the valuation of construction works throughout a project)

Optional competencies

Level 2 *(application of knowledge and understanding)*

Conflict avoidance, management and dispute resolution procedures

(Provide evidence of practical application in your area of practice having regard to the relevant law)

Contract administration

(Implement administrative procedures necessary for the smooth running of a construction contract)

A chartered quantity surveyor when practising in the traditional role of a Quantity Surveyor or as a Project Manager, Contract Administrator, will have received education and training designed and accredited by the RICS. In summary, a review of the curriculum and procedures and processes implemented for the pathway of Quantity Surveying and Construction reveals that the knowledge and skills considered necessary to practice effectively are tested through a process that simply requires competency levels to be signed-off by unchecked Counsellors and Supervisors and a Final Assessment interview lasting one hour where interviewing assessors are expected to test eight competencies in thirteen minutes of questioning.

3.5.4. Beyond the assessment interview

A chartered surveyor (MRICS) beyond this stage of professional knowledge and expertise, as a practising quantity surveyor, is required, under Rule 6 of the RICS Rules of Conduct for Members, to comply with the mandatory requirement for Continuing Professional Development (CPD). Rule 6 states:

Continuing Professional Development (CPD) – Members shall comply with RICS requirements in respect of continuing professional development.

RICS (2018a)

Members must undertake and record online a minimum of 20 hours of CPD activity each calendar year. Of the 20 hours at least 10 hours must be formal CPD. Members are also required to undertake learning in relation to the RICS Global Professional and Ethical Standards at least once every three years. Failure to comply with the rules of CPD will be treated as a rule breach under RICS Disciplinary Rules and subject to a range of sanctions including censure, fines and expulsion from membership. The choice of subject matter for CPD is at the discretion of the member but could be checked and challenged by RICS Regulation.

Examples of Formal CPD Activity include:

Professional courses, seminars and conferences with clear objectives and learning outcomes.

Structured seminars.

In-house training on a technical subject.

Formal teaching and tutoring for others.

Self-managed learning.

Writing articles, reports etc.

Sitting on RICS Boards and Committees.

Training on RICS Global Professional and Ethical Standards.

Undertaking academic courses linked to a professional role, MSc etc.

RICS (2016)

As a comparator an NHS Senior Consultant in Neurology and Trauma is required to achieve 35 days of CPD per year, GMC (2020)

3.6. Critical scholarship and critical theory

There follows a review of current literature that has expressed a corpus of theory regarding professional education and training for quantity surveyors. The review also includes references to current RICS reports and publications in the public domain. The chapter section demonstrates how current literature has critiqued professional education and how RICS has endeavoured to keep pace with a changing world.

3.6.1. RICS reports

In 2015 RICS issued a report entitled '*Our changing world: let's be ready*' RICS (2015a). The report addressed social and economic trends, new business landscape, the changing role of the profession and actions for the future. Professional skills were recognised as requiring to be broader, to work across sectors and disciplines and to move away from silo thinking. There was a growing need for soft skills including collaboration, cultural intelligence, leadership and client focus including more advisory roles. A broadening of the skills base in the built environment sector was recognised as developing more generalists and managers. Programme management was a key generalist skill that was identified as lacking in construction and infrastructure.

Global outreach required cross-cultural working and the blurring of professional boundaries. Big data was seen to be a major resource that required new analytical skills. Another section of the report referred to '*Winning the war for talent*' in which it stated that there was a greater need to support mid-career professionals. The report did not make clear how the war for talent was going to be fought or how mid-career professionals were going to be supported. Entry level qualifications were not considered but a review of the existing accreditation of university courses and the development of a different relationship with

educators was stated as an action for professional bodies. The report also suggested that there needed to be an increase in levels of investment in training and development for professionals.

These are the conclusions of a report published by RICS, not necessarily drafted by practitioner members but out-sourced to a management consultant. Fast-forward four years and very little has changed, apart from an increasing desire for global outreach and investment by the institution in university and professional education facilities in foreign countries; doubtless driven by the reward of increased membership and the corresponding revenue from fees. The policies for training and education have not changed; the APC process has not changed; competency requirements have not changed; academic levels of entry have not changed; alternative routes to membership have been relaxed and the requirements for Fellowship have been reduced to personal recommendations. This research evaluates the realities of practice for quantity surveyors and compare and contrast with the realities of RICS aspirations and the relevance of its policies for education and training.

3.6.2. Expected skills and knowledge base

The following literature in the field examines what is currently expected from a quantity surveyor practitioner and the education and training that should be in place to achieve the expected levels of competency. However, this work by others does not inform what, in reality, actually exists in professional education or what levels of competency exists 'out there' in the reality of practice. Current literature has researched and identified the skills expected from a practising quantity surveyor and the knowledge base from which those skills should have been developed. S. J. Lee (2014) explains that the modern quantity surveyor is expected to provide services in all aspects of procurement, contractual and project cost management but the traditional skill of measurement and valuation of construction works remain fundamental to this new expanded role. Allan Ashworth (2013) identifies what the knowledge base of the quantity surveyor to be:

- Construction technology;
- Measurement rules and conventions;
- Construction economics;
- Financial management;
- Business administration;
- Construction law.

Ashworth also identifies the skill base to be:

- Management;
- Documentation;
- Analysis;
- Appraisal;
- Quantification;
- Synthesis;
- Communication.

The core skills of quantity surveying have always been recognised to be the measurement and valuation of construction work. A. Ashworth and Hogg (2008) argue that these core skills of the quantity surveyor that were important 50 years ago are still important but their importance has declined only to be replaced by new competencies. Skills can be classified under the three headings of personal qualities, core skills and process skills. Personal qualities include independence, adaptability, initiative taking, a willingness to learn, an ability to reflect on what has and has not been achieved. The core skills include the ability to present clear information when in a group, self-management, critical analysis and the ability to listen to others. Process skills include computer literacy, commercial awareness, prioritising, acting morally and ethically, coping with ambiguity and complexity and negotiating. The research by Ashworth and Hogg (2008) does not establish whether these skills have, in reality, actually been acquired by practitioners.

Standards of professional service and ethics are considered in relation to the services offered to the public. The wide concepts of professional ethics are often difficult to fully comprehend for young professionals and Christabel and Vincent (2003) observe that professionals are largely subject to public demand and that professionals remain in existence because of public demand. Professionals are in a position to fulfil the expectations of the public regarding competence, professionalism and willingness to serve. They observe that the extent of ethical training received by the quantity surveying profession will induce differences among the subgroups of quantity surveyors and that further research is required to improve the professional services offered to the general public. Their research indicated that there was a recent decline in ethical standards as a result of background variables which include: age, education level and experience, gender and management, organisation type, management level. The level of ethical standards exhibited by a practising professional has a bearing on levels of competency in practise. R Nkado and Meyer (2001) define competency as action, behaviour or an outcome which a practitioner should be able to demonstrate, or the ability to apply skills and knowledge to new circumstances within a particular occupational field. Action and professional behaviour would involve the application of correct ethical principles

Conflict and risk are increasing aspects of our society and in particular the construction industry as clients have become more knowledgeable and demanding and margins have increasingly come under pressure. A. Ashworth and Hogg (2008) observe that from society in general we are becoming more claims conscious and as such more accustomed to raising complaints and pursuing our rights. The quantity surveyor's role in a contract dispute is described as that of a witness of fact, as someone who was present at the time as project surveyor or manager and sometimes as an expert witness to the courts. Quantity surveyors have a role to play in dispute resolution and Ashworth and Hogg (2008) consider that role to be one of a neutral, providing that the practitioner has good negotiating skills and has received the necessary training.

3.6.3. Professional education

Courses in quantity surveying are available at various levels and disciplines in universities and colleges throughout the UK and A. Ashworth and Hogg (2008) identified that these courses are replicated in many former commonwealth countries around the world. They typically comprise undergraduate courses of three year full-time or four or five year part-time durations. However, Chan, Chan, Scott, and Chan (2002) suggest that the needs of the professions and the vision of academics do not necessarily coincide; as universities are increasingly relying on professional accreditation the result may be an unsatisfactory compromise. This antagonism has been alluded to previously and the procedures adopted by RICS for accreditation should in theory embrace at least some of the current developments in the UK built environment market together with the propositional base for professional practice.

However, whilst some academics have considered professional education and its need to evolve in adapting to changing demands from the built environment there still remains their own conflicting concepts with practising professionals regarding the nature and content of professional education. Buchanan (2012) claims that professional education does not engage with current critical realities nor does it prepare students for the future in which they will practice and he particularly identifies changes in construction management. Whether quantity surveying, project management and contract administration are considered to be part of construction management, is not clear. He refers to the complexity of a changing industry putting demands on professionals at the leading-edge of practise being beyond the capacity of any individual.

Others recognised that the core components identified for professional education in the future do not include a greater understanding of construction law and contract law. Wilkinson and Scofield (2002) found that in New Zealand surveying students are introduced

to law, ethics, management and finance in a broad sense during their degree programme and that practice management was integrated with other schools. It is unlikely that professional education and training in law, ethics, management and finance, '*...in a broad sense*', will equip a candidate for the reality of practice.

A quantity surveying practitioner whilst working for a construction company requires a specific range of bespoke skills and Cornick and Osbon (1994) investigated the training requirements for a contractor's quantity surveyor and concluded that training processes for all contractor's quantity surveyors should be standardised to facilitate staff training and movement between projects. The peripatetic nature of construction is a necessary part of a contractor's quantity surveyor's role and 'System syndicates' should be introduced for the quantity surveyors within the company to understand, rationalise and refine their processes into a common companywide format. These are all factors that are relevant in the development of the quantity surveying practice and current education and training which are not incorporated into RICS pathways. Quantity surveyors working for construction companies are prominent in the raw data gathered for this research.

3.6.4. Soft skills

Other literature in the field addresses the benefits of softer skills developed through the humanities; and Coleman (2010) particularly refers to architecture when he states that professional education is principally concerned with the development of practical skills of practice and the humanities are largely neglected. These comments are considered to apply generically across professions in the built environment. Coleman (2010) suggests that professional education in universities is placed somewhere between the humanities and the sciences. However, the research found that the training of professionals has become more vocational to cope with the demands of practice. To what extent professional training and education is coping with the demands of practice is not made clear in the research.

Some practitioners find people skills difficult to embrace and naturally default to the technical aspects of project administration. Dulaimi (2004) illustrates that changes within the business environment can create great pressure on budgets for more effective professional education and training. He argues that project managers with a more technically-oriented background may have a pre-occupation with technical aspects of project management at the expense of humanities and people management. Individual preferences in this regard have consequences for applying the appropriate administration for contractual issues and correct contract practice. The need for communication skills and an appreciation for the dynamics of relationships are recognised by P. Galloway (2007) in stating that the practice of quantity surveying must be changed in the 21st century from that which has prevailed essentially for the past 40 years. Professional education that includes instruction in communication and multi-team participation may allow practitioners to collaborate in the administration of construction works; but without specific knowledge and the necessary skills to apply that knowledge the team could collectively make the same errors of judgement and practical application.

Cheung and Suen (2002) state that conflicts in the construction project environment are inevitable and conflicts can quickly result in a dispute between the parties to a contract. They suggest that the preservation of relationships is a key element for business activities and that a good relationship is based on trust, common interest and mutual respect. Negotiation is recognised as the most common form of dispute resolution and the quantity surveyor is often best placed to undertake this role. Similarly the project process and people are considered by Diekmann and Girard (1995) regarding issues of project conflict. They believe that there is a relationship between the occurrence of conflict on projects and the extent to which people skills are demonstrated by the project team. The experience/competence of the individuals of the organisation responsible for management of the actual construction process and their ability to develop effective relationships has an

impact on the project outcome. However, in their final analysis they suggest that people factors are simply classified as a variable without any further interrogation.

Soft skills related to leadership are explored by Kumar and Kent (2007) who consider teambuilding, motivation, risk taking, vision, honesty, integrity, ethical standards, communication, responsiveness and empathy to be the most common dimensions of a leading construction professional. They propose that this knowledge and these attributes are acquired by problem based learning techniques. Their research does not provide any evidence that these professional characteristics form part of any existing programme of professional education and training.

3.6.5. Continuing Professional Development (CPD)

Continuing Professional Development (CPD) and/or the ethos of life-long learning, whilst prescribed by RICS, remains an implied responsibility for the practitioner. The extent to which an individual engages with life-long learning will continue to be a matter for the individual. Seeley (1997) assessed the attitude of UK business to training and identified two distinct approaches to CPD: the fragmented approach and the focused approach. The *fragmented* approach does not link CPD to business goals. It sees CPD as a cost, as short term, as being about training and knowledge acquisition; hence CPD is seen as unimportant, something to be ignored in the office or viewed as a reward for good performance. The *focused* approach sees CPD as an investment, concerned with skills development as well as knowledge acquisition, something to be evaluated to initiate change and flexible in the way it is done. These observations made by Seeley in 1997 are still pertinent today and a personal reflection by the author from practice indicates that attitudes to CPD are at best, varied. Eraut (1994) states that continued professional education has one prime objective that is to connect practising professionals with new knowledge and ideas. This may be by way of general updating or as a stimulus to critical thinking and self-evaluation,

understanding a new innovation, or simply complying with a new mandatory policy. None the less despite mandatory regulation, CPD remains a matter for the individual practitioner.

Regarding the individual, self-reflection and self-regulation are aspects of professional development that have been explored by scholars. R. Nkado (1990) considers self-reflection to be a means by which a professional can enhance the quality of professional services offered to clients and employers. Chan et al. (2002) when considering professionalism they identify self-regulation as a means to maintain high standards and the self-awareness of continued training to update personal knowledge; an option for the individual that may not address the complications of quantity surveying, contract administration and construction law. Practice overlapping is illustrated where respondents to their research had experience in practice overlapping their professional roles with other construction professionals; whilst providing the benefit of shared knowledge and skills it often created un-settled roles among the different professional disciplines. Chan et al (2002) point out that construction education should be cognisant of its responsibility to formulate future curricula for the built environment and professionals are reminded of their obligation to lifelong learning.

3.6.6. Knowledge management

Knowledge that exists within every business organisations is a valuable resource to be identified and utilised in developing a skill base for employees and a commercial advantage for the business. Knowledge within an organisation requires management to capture and share it as an asset. Abdul-Rahman, Alashwal, and Jamaludin (2011) explored 'knowledge management' in the quantity surveying profession and suggests that a systematic approach to identify knowledge and encourage the flow to the right people at the right time. They believe that companies must use knowledge management to achieve the mission and vision of company objective and goals. Project learning is defined as a procedure for project teams to create and share knowledge within the project. Learning methods include project learning reviews and post-project appraisal where lessons learnt form an important source of knowledge and training for the quantity surveyor. Predictably the human element is

suggested as the main barrier to the implementation of project learning where there exists an unwillingness of team members to share their knowledge and a difficulty to locate, capture, generalise and store knowledge.

Research indicated that on-the-job training is the most preferred way of learning in quantity surveying firms and construction companies, together with problem solving techniques in a knowledge sharing spirit. In summary Abdul-Rahman concludes that the top five learning methods are: on-the-job training, problem solving techniques, periodic meetings, debriefing and documentation training. It was also considered important to maintain a portal to store the knowledge and experience of the firm's quantity surveying experts. Again it is not clear from the research whether these techniques are in place or how frequently they are utilised across the industry. RICS, in its professional training and education documentation does not refer to or recognise the advantages of knowledge management within an organisation.

3.6.7. Closing comments

Current literature referenced in the foregoing research into professional education, training, knowledge and practice skills have identified and explored the following issues that is considered to be currently necessary for the modern, enlightened practitioner:

- Engaging with current critical realities.

- Students unprepared for the future.

- Greater understanding of construction law and contract law

- The leading edge of practice.

- Practical skills and not humanities.

- More vocational training.

- Collaboration between professional disciplines.

- Bias/preference for technical issues at the expense of soft skills.

- Soft skills.

- Problem based learning.

Conflict between academics and practicing professionals.

Life-long learning.

Knowledge management.

It is suggested from the previous references that some researchers and the RICS recognise that the traditional skills of measurement and the valuation of construction works prevail as core competencies for the quantity surveyor in practice. There is also scholarship that explores a broader view that seeks to consider the demands of reality. With this in mind, other scholars have looked beyond traditional skills of quantity surveying and Male (1990) states that knowledge is an important power base for professions and the source of expertise in areas of uncertainty. He believes that the knowledge base of the professional is a responsibility for the individual and that knowledge has an inverse relationship with uncertainty. Flannagan and Norman (1999) remind us that risk and uncertainty exist because all is not known. That risk and uncertainty in construction may be linked to the prevailing level of professional expertise and competency demonstrated by practising chartered quantity surveyors.

Many of the points raised in the RICS 2015 report resonate with current work by scholars in the field, (Cartlidge 2013, Ashworth and Hog, 2008, Seeley 1997, Nkado and Meyer 2001). However, it is not evident whether conclusions drawn in current literature and/or recommendations made in the RICS (2015) report actually manifest any sort of change in RICS policies of education and training for quantity surveyors. This research asks to what extent is the quantity surveying profession adapting and embracing new trends in industry processes and procedures, changing demands from clients and increasing technical advances. This identifies the dichotomy of the epistemologies of professional knowledge, where some say that professional practices are developed 'on the job', 'out there' and not within academia.

Having received education and training designed and accredited by RICS, this research asks whether a practising quantity surveyor has the knowledge and skills necessary to address current issues of practice. Knowledge and skills that have been obtained through a process that simply requires sign-off by unregulated Counsellors and Supervisors and to a competency level with a definition that may not be specifically relevant to current market conditions. Buchanan (2012), Coleman (2010), Dulaimi (2004), and Chan et al (2002) have all expressed opinions regarding current and future requirements from professional education and the development of appropriate competencies and skills but there remains a paucity of research that identifies current standards of practice in action. Current research identifies what is required, an inventory of skills, expertise and knowledge but does not establish to what extent these skills exist in reality and what the requirements are from the perspective of the practitioner. An analysis of empirical data gathered in support of this doctoral research seeks to evaluate and determine the extent to which present RICS education and training is relevant for the current needs of practitioners.

3.7. Summary of the Chapter

Current literature has been the source of theory for this chapter and has supported the introduction of the profession of quantity surveying, its governing professional body, RICS and current policies and procedures for the education and training of quantity surveyors. Later sections in the chapter include a critique of education and training for quantity surveyors also drawn from current literature. This chapter establishes a professional context for the research defining the practitioner, the governing professional body, the current programme for professional education for quantity surveyors and a critique of the relevant professional education. All of these aspects of the profession of quantity surveying are constituent parts of the field in which this research is placed.

4. LITERATURE REVIEW – PROBLEMS OF PRACTICE FOR QUANTITY SUVEYORS

4.1. Introduction

This chapter explains the nature of practice-based issues faced by quantity surveying practitioners during the construction phase of projects in the current UK built environment. Focusing on the reality of problems faced in practice situations provides a measure of how relevant current education and training for quantity surveyors enables the practitioner to competently address these issues. The purpose of the chapter is to explain the current reality of practice and clearly identify the range of practice functions that are seen to be the source of conflict, dispute and risk on construction projects. Scholarship referenced in this section also identifies areas of professional knowledge that are complex and often misunderstood by quantity surveying practitioners but at the same time relevant for competent practice. This research asks whether the current RICS programme of education and training has sufficiently developed in line with the demands of industry. Or conversely has it simply contributed to the increasing occurrence of dispute, conflict and risk for project stakeholders. The practice issues and circumstances identified by the following existing body of knowledge and research in the field serve to explain the nature of what is 'out there' in the realities of practice for a practising chartered quantity surveyor.

In this chapter the phrase 'conflict, dispute and risk' is used and, for the purpose of this research, is taken to be synonymous with practice-based issues and matters of practice that confront and test quantity surveying practitioners. Practice-based issues faced by quantity surveyors often lead to conflict which crystalize into a dispute, which in turn creates financial risk and uncertainty for all project stakeholders. The purpose of this chapter is to explain the nature of construction phase conflict and risk that chartered quantity surveyors are required to manage. The extent to which these issues are identified and managed, or not, by the quantity surveying practitioner has a direct influence upon the outcome of a construction project, as argued by Ashworth and Hogg (2008), Nkado (1999), Buchanan (2012), Coleman (2010) and Dulaimi (2004). Conclusions and theory drawn from this existing

literature provide a greater understanding for the nature and origin of construction phase conflict and hence practice-based-issues that are encountered on projects in the built environment. One of the objectives for this research is to understand the nature of practice-based issues faced by quantity surveyors and to what extent those issues inform RICS professional education and training.

4.2. Conflict and dispute

Current research found that construction and engineering disputes in the UK reached the highest average level since 2010 and remain at an all-time high as UK construction is considered to be costlier than North America and Europe, Kitt (2018). Construction disputes are reported to be taking longer to resolve involving the services of expensive professional resources for over a year and the value of disputes has increased by 50%, Allen (2013). Other reports confirmed that disputes between main contractors and clients/employers were considered to be rife, Farah (2015). An article in Building Magazine (Rogers, 2019) records that the number of High Court disputes in the construction industry has risen for the third consecutive year according to the financial advisers Accuracy. Their data recorded a total of 397 in 2018/2019, an increase from 311 in 2015/2016. This data indicates the nature of current customs in the construction industry and complexity of practice faced by a quantity surveyor. Chapter 5 of the thesis provides a more detailed assessment of current case law that further highlights problem matters of quantity surveying practice. The profession is at the heart of these issues and the level of competent practice that scholars have referred to appears to have a relationship with the occurrence of conflict and dispute.

Adjudication is a popular method of alternative dispute resolution (ADR) as is mediation, conciliation, expert determination, early neutral evaluation and the use of Dispute Review Boards. Milligan and Cattnach (2018) produced a report for the Adjudication Society that

confirmed the number of referrals made to Adjudication Nominating Bodies (ANBs), who are responsible for appointing an adjudicator to each referred dispute. A 'referral' is a notice given by one party to a contract seeking redress from the other party by referring the matter to an adjudicator for resolution. RICS is one of a number of ANBs. The report shows that since adjudication was introduced in 1998 the number of referrals have been steadily increasing year-on-year and in the year ending April 2017 there were 1533 matters of conflict referred to an adjudicator. All of which indicates that conflict in construction is increasing and remains at the forefront of practice for chartered quantity surveyors.

Since its introduction in 1998 adjudication, once a 'quick fix' solution for matters of conflict and dispute, it has evolved into the realms of litigation. The process could now potentially involve hearings, barristers, experts and various pleadings. Every clause in the 'Act' that promotes adjudication has been interrogated by lawyers and the process could be as near costly as litigation. This scenario is aptly captured by a lawyer, Robertson (1998) who observes how practicing law has taught him little more than that there are two sides to every argument and the final verdict will go with a good argument even if the other argument is better but poorly presented. The preparation of evidence in support of adjudication and litigation is an important function of a chartered quantity surveying practitioner. The chartered quantity surveyor is expected to provide evidence of fact that assists the adjudicator or court when reaching a final decision or judgement. Evidence based on contemporaneous records made by the quantity surveyor and where some degree of expertise is expected to interpret the evidence provided.

This research suggests that issues of disagreement and conflict that are currently referred to adjudication, could be addressed by knowledgeable, educated, competent front-line quantity surveying practitioners before the circumstances 'crystallize' into a costly, formal dispute.

4.3. Poster Project Problems

The review continues with reference to examples of extreme consequences ensuing from scenarios of conflict and risk on major projects in the public and private sectors. Details quoted from these examples demonstrate the magnitude of financial risk at stake in the escalation of conflict and dispute. Although the financial magnitude of these examples is not common, the occurrence of conflict and dispute is an endemic feature of construction and is considered by others to be pandemic, attested by P. Love, Davis, Cheung, and Irani (2011) and Fenn, Lowe, and Speck (1997).

The scale of possible financial impact is highlighted here by the following selection of major projects which have suffered considerable construction phase issues. The budget for Edinburgh Trams increased from £545million to £830million and the project has been abandoned and has not delivered its original scope (BBC (2011); the Faslane nuclear submarine facility optimistically proceeded with a guaranteed maximum price contract of £150 million and concluded with an over-spend of £100million and one member of the construction consortium recording a further £35 million pound loss in 2015 (Morby (2013), Withers (2015); the four-year dispute over the construction of Wembley Stadium attracted £22million of legal costs including £500,000 for photocopying (Chellel (2008)). The purpose of referencing these problem projects is to underscore the potential magnitude of issues that develop during the construction phase of projects. As stated previously, the chartered quantity surveyor is inevitably at the heart of these and similar problem projects and the extent of knowledge, expertise and competence demonstrated by that practitioner impacts on the outcome of the project.

Circumstances at the root of these problems manifested during the construction phase of the project. Edinburgh trams involved an unrealistic scope and substructure unknowns. Refurbishment of the Faslane submarine facility commenced following the choice of an

inappropriate and unsustainable procurement route for a large scale refurbishment. Wembley stadium suffered from scope issues and supply chain problems. The establishment of scope is a matter for project documentation, as are the risks from ground conditions. Procurement that establishes a guaranteed maximum price for major refurbishment is unrealistic. Supply chain problems invariably involve scope changes, variations and late payment. All of the factors referred to here, involve the work of a quantity surveyor. Poster problems such as these serve to highlight the harsh realities of practice for quantity surveyors and the complexities of issues that could be encountered in practice situations. This research evaluates whether RICS education and training for quantity surveyors goes far enough to prepare the practitioner for these complexities.

4.4. Everyday Problems of Practice

Problems of practice or practice based issues are common phrases used in this research project and the use of these phrases has been explained briefly in the Introduction Section 1.2.4. The following sections of this chapter provide a review of the current research literature that identifies practice-based issues that appear to be the root cause of conflict and dispute in construction.

Allen (2013) in compiling a report for E C Harris found that construction disputes were on the rise. He recognised that the top five causes of disputes in construction projects during 2010 were:

- A failure to properly administer the contract;
- Ambiguities in the contract documents;
- A failure to make interim awards on extensions of time and monetary relief;
- Unrealistic risk allocation between employers and contractors;
- Change imposed by the employer.

The report by Allen (2013) suggests that whilst the contracts themselves have mechanisms for dealing with inter-related time management and notification issues, they require the appropriate administrative procedures to be effective. A failure to properly administer the contract and to make the appropriate interim award appears to reflect upon standards of professional practise and expertise. Poor administration of the contract and a lack of properly issued interim certifications can influence cash flow and may sometimes cause complete failure for the contractor and the project. Decisions regarding interim awards rely upon the following practice-based factors: the quality and standard of substantiation provided to support the application; the level of knowledge, expertise and experience of the contract administrator/quantity surveyor or project manager; and the impartiality of the professionals and the level of authority assigned to them. In conclusion, Allen argues that applying the right skills at the right time and concentrating on delivering what the employer needs and delivering those needs in accordance with the contract would reduce the nature and extent of any issue or dispute.

The National Building Specification (NBS) and the Royal Institute of British Architects (RIBA) published a report entitled National Construction and Law Report, NBS (2018). The report concluded that more than half of the disputes identified had a value greater than two hundred and fifty thousand pounds. Regarding the causes of dispute, the investigation identified the following four main issues to be:

- extensions of time;
- valuation of final account;
- valuation of variations;
- The valuation of loss and expense.

Reflecting upon the conclusions of both these reports illustrates the type of issues that practising quantity surveyors are required to administer and resolve satisfactorily, or not, as the case may be. Considering the nature of these problems prompts the question as to why

these practice-based issues have become the basis of conflict and hence dispute and how they have been managed and administered to this point by practitioners. Providing an answer to these questions enables a comparison with the current curriculum of RICS education and training for quantity surveyors and the evaluation of its relevance for practice and practitioners.

Other research particularly by Genton (2014) recalls a long career in dispute resolution and summarises some of the key issues that have caused conflict and disputes encountered during his professional working life. The key issues identified by Genton (2014) clearly involve the competency of a quantity surveying practitioner acting as a member of the project team. The key issues include:

- Cash shortage;
- Contract interpretation;
- Enforcement of decisions;
- Dissenting opinions.

Correctly managed cash flow during the progress of the works is critical for both parties to the contract and becomes a heavy burden when substantial additional works and unforeseen delays have to be accommodated. Cash flow is related to the valuation of construction works and the administration of contractual payment mechanisms. Contract interpretation is usually a function of contract documentation, enforcement of decisions requires the correct management and implementation of contractual certifications, a matter of dissenting opinions require an informed response based on current, correct professional knowledge and expertise. All of these issues fall within the scope of quantity surveying practice. Another example of where current research in the field has identified key issues of quantity surveying practice that have resulted in conflict and dispute.

Contract documentation, change management and relationship issues are identified by P. Love, Davis, P., Ellis, J. (2009) as still impacting on the performance of the construction industry despite efforts to improve the project processes and professional competency. Practice and process issues identified here, as previously, are all within the practice scope of the quantity surveyor. Although three decades ago now, Jahren and Dammeier (1990) identified similar issues that still have relevance today:

- Changed conditions;
- Defective specifications;
- Subsurface problems;
- Payment issues;
- Time and delays;
- Errors in bids;
- Lack of communication and relationships.

More recently Sayed Bassiony, Abd El-Karim, Aly Mosa El Nawawy, and Mohamed Abdel-Alim (2017) recognised that although completion on time and to the predicted cost is as important to the client as it is to the contractor, issues of unexpected cost increases and delays still occurred and could be attributed to both the client and the contractor. The quantity surveyor has the responsibility to manage these issues and report to the client and the contractor in a way that benefits the outcome of the project process. Knowledge, skills and competency in record-keeping, commercial management, reporting and communication are all applicable here.

Construction phase issues were extensively analysed by Cheung and Hoi Yan Pang (2013) in their research. They believe that construction projects are predicted to face enormous uncertainties and the contract, Cheung and Hoi Yan Pang (2013) suggest, is unavoidably incomplete and cannot incorporate provisions to deal with all possible contingencies. They assert that it is not uncommon for clients to refuse to give fair compensation to contractors

even though there are legitimate causes. The contract re-states the intentions of the contracting parties and deals with the uncertainties of the construction phase. Cheung and Hoi Yan Pang (2013) consider that contract incompleteness is a major factor in practice-based issues for construction. Ambiguities in contractual agreements are recognised as being the cause of interpretational difficulties and in particular with the incompatible interests of the contracting parties. Cognitive conflict refers to the collaborative problems that arise during the construction stage. Cheung and Hoi Yan Pang (2013) suggest that there are two types of practice-based issues encountered in construction disputes: (i) contractual and (ii) speculative and that contract incompleteness is the primary cause of both. Here Cheung and Hoi Yan Pang (2013)_ identified a quantity surveying practice problem involving project documentation and communication. These issues have been identified from the reality of practice but the research does not explain why the problems have occurred.

Circumstance, practice, task performance and contract interpretation are identified by P. Love et al. (2011) who suggest that these problems of practice have become an endemic feature of construction despite intense introspection into causes and avoidance procedures. Using the word pathogens they identify these matters to be most common contributors to disputes between the parties. Fenn et al. (1997) suggest that conflict in construction is pandemic and it exists where there is an incompatibility of interests between the parties but, in their opinion, conflict can be managed. They do not explain who manages that conflict or how the conflict is addressed. Conflicting project objectives suggests poor contract documentation, communication and an inadequate explanation of the contract obligations all of which fall within the remit of a chartered quantity surveyor.

These are all quantity surveying functions that have resulted in conflict and are described in current research literature as being pandemic and endemic in the industry. Although it is proposed that there is little empirical evidence to justify the many theories about the causes

of disputes but often the problem of terminology and causation are raised which makes the point that an incorrect interpretation of contracts terms and conditions may be practice-based issues that are the beginning of conflict and dispute. However, Love et al. (2011) and Fenn et al (1997) both believe that conflict, dispute and risk are to be expected in construction and are widespread throughout the industry. If these issues are as common as existing research suggests then to what extent does RICS education and training recognise the need to review and adjust its curriculum accordingly.

As the industry develops new procedures and processes which are introduced into the fabric of a project, they become part of that which the quantity surveyor is required to manage. Knowles (2009) identifies a changing industry that has had to cope with many new ideas and procedures introduced since 2000. For example, clients who have insisted or been advised to enter into contracts with a guaranteed maximum price have been disappointed (the MOD at Faslane), in trying to resist requests for payment when the price has exceeded the guaranteed maximum. Consequential loss, which is an entitlement to damages stemming from a breach of contract, remains undefined and contentious; letters of intent and payment for work commenced speculatively raise issues of liability; a time barred notice prevents a contractor from receiving an extension of time to which it is entitled. All of these complex issues of practice fall within the jurisdiction of quantity surveying. To be relevant, RICS education and training for quantity surveyors must demonstrate cognisance of these changes and developments and have the means to adapt the curriculum as necessary.

Others also describe how construction has become more complex and Glover and Fenwick Elliott (2005) in their study of building contract disputes refer to an increasingly complex industry, as a statement, but they do not provide examples of the complexities. D. F. Turner and Turner (1999) explain how changes in construction have brought new jurisprudence

that requires new skills and techniques from construction professionals. Matters of jurisprudence that involve interpreting the legal theories surrounding, for example, 'good faith' and 'duty of care'. Both of which are required to be administered in accordance with current legal precedence by practicing quantity surveyors. Guaranteed maximum price contracts, consequential loss, letters of intent and condition precedent/time barred contract clauses are all subjects of current jurisprudence that the quantity surveyor is expected to manage and administer, to the extent that RICS education and training has provided knowledge and understanding for competence. This research questions how RICS education and training addresses these complex issues and any associated developments.

The inevitability of construction conflict and dispute is also recognised by Cheung and Wing Yiu (2006), as do other researchers, they discuss the triggering events of non-performance, payment and time; and reduce the relationship of events to a mathematical formula. Fuzzy probabilities of occurrence are then calculated to predict the most likely range in which construction problems will occur. This analytical approach absorbs the human and legal dimensions of practice-based issues of construction into statistics. The statement that conflict is inevitable in construction and is caused by non-performance, payment and time issues does not address the causes of these issues but matters of payment and time suggest, together with other previously referenced research, that problems of practice regarding quantity surveying could be the cause of conflict and the ensuing consequences for stakeholders.

Scholars have consistently recognised matters of professional practice within the scope of quantity surveying that have resulted in conflict and dispute. However, the research previously referenced does not make any connection between the occurrence of conflict on construction projects and RICS curriculum of education and training for quantity surveyors. Neither does the research draw any conclusions regarding levels of professional

competence in relation to identified issues of practice. This research uses the issues of conflict recognised by existing research and attempts to explain why these issues continue to occur with increasing regularity and with increasing financial consequences. Therefore from a base-line of clearly recognised problems of practice identified by current research in the field, this study evaluates whether there exists a relationship with RICS professional education and training.

4.5. Problems of Practice from Standard Forms of Contract

An integral part of any construction project is the main contract that exists between the client/employer and the contractor. The quantity surveyor acting for either party to the contract has a managerial/administrative role in overseeing obligations set out in the contract conditions. Research previously referenced by Allen (2013), NBS (2018), Genton (2014), Love et al (2011) and Bassiony and others highlight problems of practice that are faced by chartered quantity surveyors in complex practice situations. These issues will invariably arise whilst the practitioner is carrying out professional obligations and duties prescribed under the conditions of a standard form of building contract. The following sections explain in more detail the obligations for a practising quantity surveyor in various roles under a standard form of contract.

Widely used in construction, standard forms of contract have become the default solution for project teams wishing to provide a document that will establish rights and obligations of the parties to a construction project. The standard forms are generic and commonly used in the industry with unreserved familiarity. The most commonly used standard forms in UK construction are published by Joint Contracts Tribunal (JCT) and the Institution of Civil Engineers (ICE). The New Engineering Contract (NEC), also known as the Engineering and Construction Contract (ECC) is a generic name for a family of contracts published by ICE, (Davis (2010), NBS (2018)).

4.5.1. JCT Forms

The JCT forms require the appointment of a Contract Administrator, Lupton (2011) explains that this appointment could be a chartered quantity surveyor. Lupton (2011) states that this is a significant role under the contract, with the power to issue certificates and order variations. Acting at times as the employer's agent and at other times as an independent administrator, a court would assume that parties to the contract will expect the contract administrator to act fairly at all times in applying the terms of the contract. These professional obligations place onerous responsibilities with the presiding practitioner operating at the front line of the project. Unlike an arbitrator, the contract administrator is not immune from being sued. Certification for payment and issues that extend the contract period together with the certification of Practical Completion (which certifies that the contractor has fulfilled its obligations under the contract with only very minor works outstanding) are onerous and often very complex to administer. The extent to which the quantity surveyor acquires competence in the administration these practice matters may be reflected by the occurrence of conflict and dispute issues.

Under JCT the chartered quantity surveyor is also appointed in a traditional role which involves preparation of contract documentation, the management of procurement and measurement and valuation, all of which resonate with practice-based issues identified in the research of Allen (2013) and NBS (2018). Acting in any of these roles on behalf of the employer, traditionally the practitioner's fee is paid by the employer, a matter which has regularly raised questions of impartiality and the inability to act fairly and in good faith. These are further examples of practice aspects, professional conduct and professionalism that are required to be addressed by the practitioner whilst carrying out obligations prescribed by the conditions of a standard form of contract. The extent to which these practice matters inform the curriculum of RICS professional education and training for quantity surveyors remains questionable.

4.5.2. NEC Forms

Regarding NEC, the other standard form of contract most commonly in use, B. Mitchell and Trebes (2006) suggest that NEC is different from traditional forms of contract because it has been drafted with the following clear objectives; it requires a change of culture from those who are party to the contract; it is intended to promote good management as a document of procedures; and it encourages trust, collaboration and early risk identification. The drafters propose that the document is based on a '*spirit of mutual trust and cooperation*' which is stated as being a real contract requirement and not just fancy buzzwords dreamt up by the authors of NEC. Mitchell and Trebes (2006) also recognise that the Employer, under NEC, is required to appoint a Project Manager and a Supervisor to manage the contract on its behalf.

Broome and Perry (1995) recognise that the administration of an NEC contract requires a different skill and expertise to be demonstrated by all parties involved with precise procedural requirements for the named individuals in the contract to coordinate their work. B. Mitchell and Trebes (2006) reiterate that NEC is a contract that promotes procedures and as such requires the Project Manager and Supervisor to respond and administer the contract in accordance with the prescribed processes. They believe that the procedural requirements of NEC are an improvement on other existing forms of contract. Practitioners working in accordance with these procedures are therefore expected to have knowledge, understanding and experience of the prescribed procedures to administer their contract obligations correctly and in the best interest of all parties.

The Project Manager appointed for an NEC contract could be from any of the built environment professions including quantity surveying. Hughes (2013) also states that the Project manager is appointed by the Employer to manage the contract on its behalf and that it is vital that the Project Manager appointed has the knowledge, skills and expertise to fulfil

the responsibilities required by this demanding role. Under NEC the quantity surveyor is also engaged traditionally to prepare documentation, manage procurement and measurement and valuation of construction works. Despite '*a spirit of mutual trust and cooperation*' responsibilities in carrying out these roles of management, administration and traditional quantity surveying functions have a resonance with issues raised by Allen (2013) and NBS (2018).

Contract Administrator, Employer's Agent, Quantity Surveyor under JCT; Project Manager, Supervisor, Quantity Surveyor under NEC are all roles undertaken by quantity surveyors. As previously attested by scholars, these are all professional roles that carry considerable professional responsibilities. The administration of complex contractual scenarios requires a sophisticated level of knowledge and expertise to navigate the project journey on behalf of the client. Similarly the skill and expertise required by a quantity surveyor acting on behalf of contractor, controlling budgets, procurement, supply chain, payments and final account settlements, are equally onerous. All of these roles acting on either side of the contract require a considerable level of professional competence and skill. This research asks whether RICS training and education for quantity surveyors keeps pace with the required level of professional competence and skill demanded by a complex construction process. It cannot be understated that these roles require a sophisticated level of profession expertise.

4.5.3. Contract Interpretation

Quantity surveying practitioners will typically be the project team member who is called upon to provide guidance for the interpretation of contract clauses encountered in standard forms of contract and supply chain documentation. Fenn et al. (1997) considered the administration of standard forms of contract and compared the construction industry with the chemical process industry in the UK exploring the perceptions of issues arising from the respective standard forms of contract in use. They refer to the paucity of research in this field but do not clarify which particular issues have not been addressed. They also recognised, as others, that conflict is pandemic within an adversarial construction industry.

Pye (2012) explains that the interpretation of contract conditions requires giving the words of the contract their simple and ordinary meaning with some cognisance of background knowledge and party awareness. Rees (2016) agrees that the rule of interpretation takes the common sense approach that words should be given their '*natural and ordinary meaning*' which assumes that the drafting of formal contract documentation does not include linguistic mistakes. As stated previously, working with standard forms of contract in various professional roles has become a major part of the practice of chartered quantity surveyors.

Rameezdeen and Rajapakse (2007) speak of the standard form of contract as having a significant role in a construction project as it translates procedures, rights and obligations of the contracting parties. Therefore a common approach to the interpretation of terms and conditions is a precursor to process harmony and a smooth running project. Their research refers to the readability of contracts which is defined as the complexity of words and sentences and how comfortably or easily the conditions can be read. The study concluded that NEC is more readable than other standard forms of contract. Lyons (1999) refers to the legal interpretation of contract conditions and subjectivity created by the open texture of law which leads to conflicting opinions of meaning and the application of contract conditions. This open texture of contract drafting conditions is usually expected to be unravelled by a quantity surveyor as the most suitably equipped member of the project team. Construction law is not prominent in the curriculum of RICS education and training and the extent to which it should be is questionable.

In reality, all of the standard forms of contract in common use today clearly place onerous responsibilities upon the project leader and other members of the professional team in the administration and management of construction contracts. The professionals have a quasi-judicial role when making judgements regarding matters of obligation, responsibility and entitlement from procedures set out in a construction contract. Whatever the particular nomenclature, the team leader can be a quantity surveyor or a collaborative combination of

other professions. The way in which differences between the parties to a construction contract are administered, particularly in the early stages of the emergence of a difference, will define whether the matter 'crystallizes' into a dispute. However, the body of research in the field of quantity surveying practice does not identify whether specific professional education and training appropriate for the current needs of industry exists and whether the lack of it contributes to the burgeoning phenomena of the practise-based issue of conflict, dispute and risk in construction.

4.6. Problems of practice from Construction Law

The administration of construction work exposes the quantity surveying practitioner to aspects of construction law. Akenhead (2014) attests that society has been constructing buildings and permanent structures for at least 9,000 years so it follows that there has been building conflict for that long and as such construction law. The extent to which construction law, having been around for so long, is part of the curriculum of RICS education and training for quantity surveyors could have some bearing on the occurrence of practice-based issues during the construct phase of contracts. Construction law, as an entity in its own right, is a recognised aspect of the law. The quantity surveying practitioner cannot escape the particularly relevance it has for the administration of a standard form of contract and the associated day-to-day issues of practice. Under these circumstances this study evaluates whether the practitioner has the necessary knowledge and skills to administer these issues for the client/employer and whether RICS professional education and training is sufficient to resolve any deficiencies. The following sections of the chapter identify common problems from construction law faced by practising chartered quantity surveyors.

4.6.1. Communicating to the client

Most standards forms of contract specifically entitle a contractor to apply for reimbursement of direct loss and / or expense incurred as a result of specified matters in the contract; all of which are within the direct control of the employer and for which the

employer is responsible. D. F. Turner and Turner (1999) describes a complex construction process which they consider to be a spawning ground for disputes. The grounds for possible future issues are often apparent in the early days of the project with the client and its advisers unable to fully articulate their objectives from the outset. Employers are often unaware or ill-informed of their responsibilities and obligations under the contract which is part of the contract documentation prepared by the quantity surveyor. Good professional practice assumes that these matters are communicated to the parties prior to attestation and in anticipation of the possibility of misunderstandings and conflict in the future. The reality of practice and research in the field suggests that this is not the case and that parties to a contract drafted by the quantity surveyor are often not fully aware of their obligations. Turner and Turner have identified another aspect of quantity surveying professional practice that often leads to developing conflict and dispute between the parties. This research considers how professional education and training for quantity surveyors can embrace these more obvious matters of communication.

4.6.2. Establishment of the contract

The previous section of this chapter highlights relevant matters prior to the construction contract being signed by the parties. This section looks at legal aspects surrounding the formation of a contract. An insight into legal matters that have bearing on the work of a chartered quantity surveyor is provided by a lawyer, Dworkin (1977), in considering generically the establishment of a contract. Dworkin (1977) attests that it provides agreed ground rules within the contract conditions before the obligations of the contract commence being discharged. Disputes can occur when seemingly reasonable and applicable rules that have not been agreed are proposed to be enforced. Bingham (2011) identifies that means must be provided for resolving issues of difference without prohibitive cost or inordinate delay, procedures that deal with bona fide civil disputes which the parties themselves are unable to resolve.

Shapiro (2011) refers to sharing a plan in collaborating through contract and that the function of a shared plan is to guide and coordinate the conduct of the parties by compensating for cognitive limitations and resolving the doubts and disagreements that naturally arise in strategic contexts. The existence of a shared plan demonstrates how parties can work together in complex, contentious or arbitrary environments. The chartered quantity surveyor, by these standards, is expected to have knowledge of the legal principles of contract formation.

Harris (2008) states that business contracts contain an agreed mechanism for dealing with specific problems, should they arise; and if the parties cannot agree on the applicability or interpretation of a particular contract condition, the contract will contain provisions that in such an event the dispute is to be referred to the more formal procedures of arbitration or more recently adjudication. A quantity surveyor should have knowledge of adjudication, which is an alternative dispute resolution procedure (ADR) that has been referred to in Section 4.2 of this chapter. The quantity surveyor may be required to administer the process for a client and produce evidential documentation in support of a contractual position. RICS education and training for quantity surveyors regarding adjudication is not prominent in the curriculum structure, it therefore remains questionable whether the practitioner has been provided with a sufficient level of knowledge for these issues of practice.

4.6.3. Construction contract claims

Chappell, Powell-Smith, and Sims (2006) state that to a client/employer party to a construction contract, the word 'claim' often means overspend and budget expectations exceeded, even though they themselves have caused the breach that attracts damages. Bingham (2011) suggests that differences do arise when there is dishonesty, sharp practice, malice, greed or obstinacy and that these characteristics are not uncommon among litigants. Well drafted claims take a long time to prepare and receive proper consideration

with substantial amounts at stake and cash flow under pressure. Time bar deadlines, which are common in standard forms of contract, are condition precedent to one party being entitled to benefits following a breach by the other party. These contract conditions are often ignored initially and later retrospectively enforced for advantage. Genton (2014) identifies that there is a considerable genuine burdens for the parties in complex case proceedings including the prospect of the final result which, in most cases, is hardly predictable. Under these circumstances quantity surveying skills that avoid formal legal proceedings and the consequential costs are particularly relevant for good practice and the benefit of clients and contractors.

The previous sections of this chapter demonstrate that there are consistencies and commonalities in the literature regarding the consequences of practice-based issues in construction and how they could have relevance for professional education, training and competence for quantity surveying practitioners. The section that follows considers specific aspects of practice which have a legal connotation together with further insight into practice terminology which provides a greater understanding of the complex issues 'out there' in the reality of practice for chartered quantity surveyors.

4.7. Problematic contract terms and procedures

Within standard forms of contract and construction law, there exists a lexicon of words and phrases typically in use which chartered quantity surveyors are required to administer and interpret. In order to reach a decision regarding matters of entitlement, the contract administrator or a similar related nomenclature, who could be a chartered quantity surveyor, must grapple with, for example: how long is *'forthwith'*, what are *'material circumstances'*, how much *'supporting information'* is required, what is *'sufficient information'*, what is *'a reasonable level of detail'*, what is *'on the balance of probabilities'*, what is *'a fair and reasonable assessment'*, how soon is *'as soon as is reasonably*

practicable, when is *'when properly due'* and what is the definition of *'in the spirit of mutual trust and cooperation'*. These phrases in common use are all good examples of the 'open texture' of legal syntax that is required to be navigated by the quantity surveying practitioner. The level of professional knowledge of construction law and contract administration necessary to properly fulfil these onerous responsibilities under the contract must be considered against the relevance and appropriateness of professional education and training accredited and developed by RICS.

4.7.1. Good Faith

The term *'good faith'* has been referred to previously and is explained in more detail here to provide further understanding of the depth of knowledge required by the practising quantity surveyor. During the construction phase of a project this complex process creates its own problems of misunderstanding, misinterpretation, failure to fulfil contractual obligations and a failure of the parties to act in *'good faith'*. The concept of *'good faith'* is a legal concept whereby the parties to a contract have an implied obligation not to act unintentionally in a manner likely to cause the other to be deprived of a benefit or benefits that the other party would otherwise have obtained under the contract. This almost intangible concept is often the cause of conflict and dispute between the parties and stakeholders to a construction project. The quantity surveyor is at the heart of these issues and is required to navigate an administrative pathway through a tangled web of customs, procedures, personalities and hidden agendas.

'Good faith' is implied in a contractual relationship, Roebuck (2011) refers to it as a legal principle. Burton (1980) considers the implication of good faith, breach of contract and the common law duty to perform in good faith and identifies that a breach stemming from this obligation has not been sufficiently articulated by the courts against a standard that distinguishes good faith performance from bad faith performance. However, he identifies that the good faith performance doctrine establishes a standard for contract interpretation

and confirms that it is a covenant implied in every contract. The cost perspective of good faith performance is suggested as a reason for bad faith performance where discretion is used to recapture opportunities forgone under contracting situations. Breach of contract is described as non-performance of a legal duty when due under the contract. Jackson (2018) explains the doctrine of good faith in relation to construction contracts and proposes that it should be defined in the context of the whole contract. The obligation does not preclude acting with self-interest and does not require the parties to be fiduciary. Normal reasonable business conduct is acceptable without capriciousness and to have regard to the genuine interests of both parties in pursuing the benefits of the contract as set out in its terms. These legal concepts are an example of difficult issues that require an understanding sufficient to be managed competently during the construction process both in an administrative role and acting as a chartered quantity surveyor.

Reobuck also discusses project partnering, another arm of contracting that the quantity surveyor is often required to administer, where the parties agree to work together and individually in the spirit of trust, fairness and mutual cooperation. These circumstances require *'good faith'* in making and performing contractual duties; but performance in this regard requires a professional expertise that is supported by professional knowledge that includes, amongst many other things, an understanding of the principle of *'good faith'*. E. Baker (2007) also examined partnering as perhaps the solution for process to avoid issues and disputes in construction. However, in the matter of *Birse Construction Ltd v St David Ltd (1999)* the parties sponsored a Team Building Seminar regarding the construction of the Adventurer's Quay development in Cardiff Bay, at the end of the seminar a signed Partnering Charter was produced expressing their overall aim towards a successful project completion. In August 1998, the contractor Birse left the site and in September 1998 commenced proceedings claiming payment on the basis of *'quantum meruit'*, which requires the employer to pay the contractor a fair remuneration according to the extent and quality of the work done. Baker suggests that these regrettable circumstances highlight the

need for certainty and a structured legal framework of the intended contractual relationship through the use of a standard form of contract in establishing the clear intentions of the parties. It is suggested also that the appropriate professional expertise could have avoided the commencement of proceedings.

Good faith is an important principle in construction and contracting which, if promoted and adhered to, could pave the way for harmony and cooperation. In order to benefit from the ethos of good faith the project team requires an understanding of what it actually means. Scholars have referred to project governance and how, when implemented well, it can produce a successful project completion. Good faith is a factor of project governance that should be part of the quantity surveyors knowledge and awareness. As it is a legal term the project team would expect the motivation for good faith to be demonstrated by the quantity surveyor. This research asks whether the quantity surveyor obtains an understanding of this valuable principle through RICS professional education and training.

4.7.2. Duty of Care

Powell (2010) addressed professional liability and as its central pillar, the duty of care owed by a professional person to his client. The legal doctrine is from Roman law but more recently the concept was applied in the nineteenth century and appeared in the face of claims against the learned professions of medicine and law. The duty is an implied term of the contract of appointment for the professional and the construct is defined as a professional person owing to his client a duty to exercise reasonable skill and care in the performance of the task required of him. The required standard of care is defined as that of: an ordinary skilled person of the same discipline. Pickavance (2010) explains the concept of tort which essentially governs an individual's relationship with the society in which he lives and regarding duty of care the following elements are necessary for a credible action in tort:

A duty of care;

Breach of the duty;

Damage resulting from that duty.

King (2017) examined the common law duty of care required of a construction professional and identified that the implied duty also applies under the Supply of Goods and Services Act 1982. King (2017) reiterates the test of required standard to be: '*the standard of the ordinary skilled man exercising and professing to have that special skill*'. The most relevant word in this phrase is 'ordinary'.

4.7.3. Negligence – Advice – Information

Hannaford and Owen (2018) consider professional negligence and the different liabilities attached to giving 'information' and 'advice'. A duty to provide information for the purposes of enabling someone else to decide upon a course of action limits professional liability only for the consequences of that information being wrong. The giving of advice makes the professional responsible for all of the foreseeable loss which is a consequence of that course of action being taken.

4.7.4. Professional Ethics

Professional ethics in construction were studied by Higgins and Britton (2008) and were party to drafting the Society of Construction Law (SCL) ethical statement which defined seven principles of behaviour at a high level, as follows:

- Honesty;
- Fairness;
- Fair reward;
- Reliability;
- Integrity;
- Objectivity;
- Accountability.

The paper concludes that defining ethical standards of professional behaviour is only part of achieving compliance from members of professional bodies. Only a few of the professional

organisations, whose rules were reviewed by Higgins and Britton (2008) devoted much energy and motivation into raising and maintaining ethical standards.

4.7.5. Professional Independence

Lester (2018) from his work on professional standards and accompanying the generally accepted professional qualities of ethics, being professional and acting professionally, raises the structural issue of conflict where independence is under pressure from the client's appointment. The auditor must demonstrate independence from the client and act completely professionally whilst at the same time earning a living from the client. These issues are relatively simple to resolve in theory but extremely difficult to apply in practice.

Shorland (1999) examines the role of the professional in the resolution of practice-based issues. He describes how the professional's decisions are the consequence of the cost and time for performance of a contract. The professional's independence is considered to be fictional as globally his decisions are subject to financial constraint and his autonomy similarly fettered. The practitioner may be a staff member of the Employer's organisation and under these circumstances would have greater difficulty in remaining neutral at the front line of resolving a construction issue. As before, these research observations assume a level of professional expertise expected from a reasonably competent professional.

The certifying powers of a client's representative were considered by Donnelly (2015) under a standard form of building contract. The practitioner is torn between simple governance matters and issues where an assessment is required particularly when the client is exerting pressure for an assessment in its favour. Case law has helped in these situations and the courts have clarified that when performing an assessment the practitioner is required to act in a manner that is 'independent, impartial, fair, and honest'. This means that the practitioner must use their professional skills and best endeavours to reach the right decision without influence from the client. Gould, Capper, Dixon, and Cohen (1999)

also consider the roles of the professionals and it is also suggested that being engaged by the client prevents objectivity in making contractual decisions regarding the contractor's entitlement. Under these circumstances there is a clear demand for high standards of professional conduct, integrity and ethics.

4.7.6. People Skills

It is often suggested that construction is about people and how they combine in pursuing a common goal. A quantity surveyor practises at the heart of construction and the following studies in the field conclude that people skills and an understanding of human relationships would benefit the construction project outcome. Practice problems have been identified by scholars as being connected with people problems, amongst other factors. Research in the field has attributed human behavioural issues to be one of the causes of conflict during processes required during the project. Whitfield (2012) considered that interpersonal relationships play an important part in addressing conflict in construction and understanding the characteristics of relationships is a soft skill that benefits both communication and negotiation. These are the factors that a practitioner should be aware of when contemplating why human beings have the urge to conflict with others:

Anthropological factors, the construction industry attracts masculinity and males are fundamentally competitive;

Sociological factors, construction attracts a particular personality with an aggressive/competitive nature but this has to be set against ethnicity, race, religion, class, age and culture;

Physiological factors, physical well-being which include physical attributes, good health, sensitivity all influence relationship skills;

Psychological factors, perception, women and men;

Prejudice, the ability to accept people as they are;

Personality types, people oriented, assertive, passive, task oriented, aggressive, submissive, conflict relates to individuals and their reaction in certain circumstances, stress,

Urge to conflict, always present but where possible identify areas where exists inadvertently or unnecessarily.

Cheung and Hoi Yan Pang (2013) analysed conflict in construction using a quantitative methodology but they also refer to cognitions, behaviour and emotions of the people involved in matters of conflict. They recognise behavioural conflict and opportunistic strategies but do not consider the impact of professional inadequacies. P. Love, Davis, P., Ellis, J. (2009) refer to an abundance of literature theorising about the causes of practice-based problems in construction and many of the factors identified in that literature are similar. They point out that, whilst useful, the identification of such factors does not explain the fundamental causes of issues. The dynamics of power struggles that emerge between the different groups in seeking to avoid responsibility for an occurrence is recognised in their research. Under these circumstances when margins are tight, contract clauses may be interpreted differently. Regarding individuals, the values that they possess will depend upon their education, training, experience, judgement and ethics. Emotional intelligence is also considered to be essential to the problem solving process. These professional skills are not factored into professional education.

Kumaraswamy (1997) studied 61 Hong Kong projects in attempting to identify the common sources of conflict in construction as a framework to isolate and control the root causes. The analysis identified external factors and project teams as prime, potential sources of construction conflict but did not provide any further details or insight into these sources. Research undertaken by Seeley (1997) in the 1990s with employers concluded that vocational surveying skills were ranked in a higher order of priority than personal skills for example: self-management, written and oral communication and the ability to solve problems. Other research concluded that it was not possible to separate the need for personal skills and technical knowledge.

A conflict system is considered by J. R. Turner (2002) as a possible cooperative system in which individuals have objectives that are exchanged through interaction. However, he identifies human frailties as a barrier to communicate and process information correctly. Contracts are regarded as a structure for the parties to align their objectives by providing the appropriate incentives. The standards of professional skills necessary to properly apply incentives to objectives are not identified and the human frailty which produces and prolongs practice-based issues in construction projects is ignored. Mitropoulos and Howell (2001) review 24 construction phase issues as empirical data. They identify opportunistic behaviour and the exploitation of gaps in the contract, without which the gaps would presumably be filled and contract would run smoothly. They assert that an effective project team can manage large complex problems whilst an ineffective team may allow small problems to grow into serious issues. The research does not define the characteristics of ineffective project teams or the practice-based issues that they expose.

Scholars have attempted to predict the occurrence of project conflict and Diekmann and Girard (1995) concentrated on aspects of project, process and people. They conceived a tool that can predict the likelihood of legal disputes which they named the '*cholesterol test*'. The test gave projects a Disputes Potential Index (DPI), designed to provide the project team with a foreknowledge of the possibility of contract issues. The prediction thus prompts the need to make any necessary changes to the project, its delivery system or its personnel to avoid the possibility of future disputes. However the research did not identify the reasons for the need to make the changes as described. Also regarding people issues, consider, amongst other factors, the experience/competence of the individuals of the organisation responsible for management of the actual construction. However, in the final analysis people factors are simply classified as a variable without any further interrogation.

Gould et al. (1999) state that conflict is caused by project uncertainties which include problems in the process and the people; inappropriate expectations and personality clashes. A dispute arises when a claim is either rejected in whole or in part or is ignored. They recognise that the production of a building is in fact the production of a prototype and not the subject of years of research and refinement. They recognise that construction professionals have a great responsibility to bridge the gap between the client's need for the built environment and the contractor's business efficacy in pursuit of profit. According to Gould et al's (1999) research there are four major stages in the crystallisation of a dispute as it develops from a practice-based issue:

1. Naming – recognising an experience as injurious and labelling the problem
2. Blaming – attributing the cause of the problem to another person
3. Claiming – voicing grievance to the person believed to be at fault
4. Dispute – occurs when the other person either rejects the claim, in whole or in part or ignores the claim.

It is suggested that there is distinction between disagreement and a dispute which recognises a difference in attitude between the parties involved. During disagreement the parties consider the problem capable of solution, the options being fluid; but during the dispute stage the attitude of the parties is described as pessimistic, polarised and entrenched. This doctoral research suggests that practitioners with the relevant professional education and training could prevent a disagreement from becoming a dispute.

J. Turner (2001) discuss project contract management and organisation, identifying a contract as a way of creating a project organisation. Conflict systems are observed to arise through bounded rationality where human frailty causes opportunism at the expense of one party or another. Contract payment terms are examined and the research assumes five standard forms of payment all of which will deliver the same out-turn cost. The cost of managing the contract is referred to as transaction costs and these include:

The cost of specifying the product in the tender documentation;

The cost of specifying the methods in the tender documentation;

The cost of managing variations to the specification of the product during project delivery;

The cost of managing variations in the specification of the process during project delivery.

Turner et al.(1999) consider that goal alignment between the client and contractor is the most significant issue in choosing a governance structure for the contract; goal alignment based on a system of cooperation not conflict. Transaction costs can be minimised by using the appropriate channels of communication and adopting the most suitable pricing mechanism. These conclusions assume that a good standard of professional expertise is a given constant that administers contract governance to a level to be expected from a competent practitioner.

4.7.7. Project Governance

Morgan and Gbedemah (2010) explored project governance and recognised that the management and delivery of large capital projects is a complex environment. They cite the project objectives, project sponsorship, project management, disclosure and reporting as the constituent parts of project governance and in their experience poor project governance is the cause of project failure. More specifically they reference the Office of Government Commerce (OGC) document and the analysis of 'Common Causes of Project Failure' which identifies the following causes:

Lack of clear project priorities;

Lack of clear senior management ownership and leadership;

Lack of effective stakeholder management;

Lack of project management and risk management skills;

Lack of understanding and management of the supply chain;

Proposals driven by price and not value;

Lack of effective project team integration between clients, contractors and supply chain.

Quantity surveyors acting for either party to the contract are at the centre of issues identified by the research of Morgan. The quantity surveying practitioner is often best placed to implement and influence the improvement of these issues of project governance and therefore reduce the impact of their absence. Project governance is also discussed by Sweet (2010) who suggests that buildings are not just about building but unfortunately UK construction tends to direct its marketing charm elsewhere once the tender is accepted. Project governance during the construction phase should include full engagement with the client and a clear definition of scope and objectives together with a mutually agreed change control process. Quantity surveyors practising as part of a project team can potentially use their knowledge of the contract documentation and their expertise to facilitate a greater understanding of the project processes, objectives and goals for the greater good. This research seeks to understand whether RICS curriculum of professional education and training recognises the benefit of a holistic ownership of project practice by the quantity surveyor.

4.7.8. Negotiation

Aspects of other professional skills relative to different types of professional challenges for the chartered quantity surveyor include the advantages of softer skills identified by a respected arbitrator, Roebuck (2011) who offered his insight into disputes and wrote, in retirement, after reflecting upon a career dealing with conflict in construction, and having read a wealth of thinking about contemporary problems. He asks how can conflict management be better understood and used in practice suggesting that the negotiated settlement is the first and most natural solution to most differences and can dispose of them before they become disputes. These settlements have always been borne of the parties and have been normal and natural but they leave few records that could benefit professional education. These settlements are also reliant upon competent professional practise that is able to demonstrate knowledge and skill appropriate for the issues in question. Roebuck recognises that negotiated settlements are always possible even in the

most complex situations Resolution of a dispute in this way requires skill, competence, respect, knowledge, courage and relationship management.

Parties to a difference attempting resolution by negotiation must have sufficient professional knowledge and skill to credibly justify their respective positions to a point where a third party is not required. Genton (2014) also reflects upon negotiation after 30 years of experience in arbitration and dispute resolution and recalls having considered at the end of a particularly lengthy and expensive arbitration where the parties had been negotiating extensively during the proceedings; whether the arbitration was really necessary and could the parties have resolved the dispute for themselves.

Concerning circumstances where the intervention of a third party becomes necessary, Roebuck (2011) states that the development of legal precedent and common law requires litigation and very few people have access to the courts where judges make new law. Roebuck (2011) identified that the high court threshold, then, could soon be £10,000 which demonstrates that litigation is the law of the wealthy and that precedent derived from negotiated settlements is merely part of *'on the job'* tacit professional knowledge that could be incorporated into professional education and training therefore avoiding costly court proceedings. Training, education and the development of soft skills is an intangible aspect of professional development that could be more widely understood and applied to the resolution of practice-based issues before the burden of litigation costs have to be met.

Peace (2011) suggests that negotiations are by far the most inexpensive way to resolve conflict on construction projects but the skill of negotiation remains a mystery to many practitioners. Research into negotiation has found that success depends upon personality traits and negotiators who are aware of their own characteristics can observe and adjust

their strategy and tactics accordingly. Following eighty responses to a questionnaire the following conclusions were made:

- Negotiators with a high degree of extraversion should not adopt a dominant approach;
- Negotiators with a high degree of openness should adopt an integrative approach;
- Negotiators with a high degree of conscientiousness should adopt a compromising approach or a low degree dominating approach.

The data showed that the most effective personality traits in achieving a positive negotiated outcome in construction conflict were extraversion and openness. Levin (1998) refers to negotiation as an art, particularly in construction, where it is a high form of that art. It is the use of techniques and strategies to achieve a specific goal. Factors that need to be considered in negotiations include:

- Adequate preparation;
- Each side has advantages and disadvantages;
- The contractor knows its costs and can adjust the outcome accordingly;
- The client holds the purse strings;
- Establish objectives and how they might be achieved;
- Anticipate the position of the other party;
- Be prepared to compromise.

The ability to negotiate at any level of competence is another important skill that should be found in the quantity surveyor's practice skills. The benefits of an ability to negotiate effectively are clearly recognised by scholars together with the consequences of the absence of that ability. Negotiation is briefly mentioned as part of the RICS mandatory competency of communication but it remains unclear how practitioners obtain the skill to a level that can benefit the resolution of issues encountered at project level. Negotiation is an aspect of early intervention in managing conflict during the construction phase of projects. This research asks to what extent did RICS consider the value of negotiation skills in

formulating its programme of education and training for quantity surveyors and how does the programme define a means to acquire this skill.

4.7.9. Competitive Tendering

Gould et al. (1999) offers that competitive tendering is a root cause of practice-based issues where the lowest tender wins the project and clients select contractors on price alone. Tendering at extremely low or non-existent profit margins to secure future work relies upon the expectation that variations or claims during the project will result in a profitable final account. Many prominent and seemingly responsible construction companies have suffered the consequences of these shadow practices. Gould suggests that privatisation can create newly developing sectors within the industry trading immaturely, taking risks which are not understood or effectively managed. Inappropriate commercial expectations and unrealistic cash flow predictions result in late payments and financial abuse further down the supply chain. Responsible professional practise supported by a relevant professional education may positively reduce the occurrence of these damaging commercial practices.

Bailey (2010) illustrates a reaction to this practice, particularly in the public sector, where a tendering contractor from a pre-selected tender list successfully won an unprecedented injunction against a local authority who were proposing to go ahead with an abnormally low bid from another tenderer. D. F. Turner and Turner (1999) suggests that a contractor's tendering policy should include for an appropriate analysis of the project and of the client and for the bid to make due allowance for losses that are without remedy through the contract.

4.7.10. Valuing Variations

Land (2014) reviewed the administration of contract variations and identified aspects of the process that need to be properly considered by the practitioner:

Scope of the works, does the instruction actually vary the works;

Does the client/employer has the necessary authority to vary the works;

The valuation procedures set out in the contract;

Review and re-open the valuation of variations.

Patterson (2014) considered a difficult aspect of valuing variations for the practitioner where work is omitted from the contract and the basis on which that work is valued. Patterson suggests that for this increasingly common tactic, the underlying cause of the omission should be established as often the client/employer instructs an omission to simply re-tender the work.

Breyer (2013) examined the determination of price for a variation under a standard form of contract and how rules of measurement and evaluation are often the source of an issue. Breyer (2013) suggests that a defined valuation mechanism in standard forms of contract would significantly reduce the number of disputed claims for contractors. This assumption presupposes that the procedures set out would be administered correctly by chartered quantity surveying practitioners.

4.7.11. Extensions of Time

An example of practice-based issues in the assessment of extensions of time is referenced from the work of Choat (2014) where he reviewed six cases on delayed projects and found that the extensions of time claims ranged from one day to two years and in each case one of the parties was proven to be 100% incorrect in its assessment of the extension of time entitlement.

The broader understanding of practice-based issues that cause conflict, disputes and risk identified by scholars in the previous sections together with the insights of a reflective practitioner steer this research topic in the direction of professional performance and education. A failure to properly administer the contract, ambiguous contract documents, failure to make interim awards, the right skills at the right time, matters of practise and task performance, problems with process and people, the requirement for new skills and techniques. These identified factors pose the question as to how professionals in the built environment obtain the necessary skills to be able to manage circumstances of practice-based issues and potential conflict; and whether the RICS curriculum of education and training for quantity surveyors is fully relevant the reality of practice.

4.8. Summary of the Chapter

At the heart of this research is the objective to understand issues of practice that influence the ability of a chartered quantity surveyor to practise competently. This chapter, through the lens of current literature, illustrates, with examples, the breadth of knowledge and expertise required by the quantity surveying practitioner to competently address issues of practice. Examples of contractual failure are used to demonstrate the consequences of severe contractual issues as measure of how critical these matters can be for project stakeholders. The chapter explains the everyday issues of practice together with issues surrounding the administration of standard forms of contract and how they impact on practise competence. Aspects of construction law and contract procedures continue to be a source of misunderstanding and misinterpretation by practitioners and in the final sections of the chapter current literature has been used to explain the vernacular encountered within these issues.

5. LITERATURE REVIEW – PROBLEMS OF PRACTICE FROM CASE LAW

5.1. Introduction

Problems of practice faced by chartered quantity surveying practitioners frequently fuel matters of conflict and dispute that occur during the construction phase of projects in the built environment. The case law emanating from conflict and dispute serves to illustrate how, on the face of it, issues of professional practice continue to have financial consequences for construction clients, contractors, specialist sub-contractors, public finance, the wider public, chartered quantity surveying practices and practitioners themselves. The chapter provides a commentary of practise-based issues that have been referred to the courts for resolution. These examples of case law are included to underline the nature of issues faced by chartered quantity surveying practitioners and the circumstances under which parties to a construction contract have abandoned confidence in the traditional skills of the quantity surveyor for the expense of litigation. These cases serve to demonstrate the magnitude of issues that confront practitioners during the construction phase of projects. Examples of reality support the various theories proposed by scholars referenced in chapter 4. This research questions how many of these cases could have been resolved by competent professional practise without the intervention of the courts and the consequential costs for the parties.

5.2. Case Law from construction disputes

The following 21 prominent cases were reviewed as examples of practice-based issues that descended into conflict and litigation:

City Inn Ltd v Shepherd Construction Ltd (2001)

C was the employer and S the building contractor under a JCT 98 building contract for the construction of a hotel. The dispute between the parties concerned completion and the entitlement to an extension of time. Clause 13.8 of the conditions of contract regarding Architect's Instructions requires the contractor to give notice of a delay to the contract completion caused by carrying the work required by the instruction. S did not give a notice

and claimed an extension to the contract completion with costs. C disputed the entitlement in the absence of any appropriate notice. It was held that the appropriate notice should have been issued by S.

(This case involves the correct administration of extension of time issues)

Walter Lilly & Co Ltd v Mackay (2012)

M was the employer and W the contractor under a JCT Standard Form of Building Contract 1998 Edition Private (Without Quantities), incorporating various special amendments. The dispute between the parties involved defective work by the contractor and delays to completion. The impact of concurrent delay caused by the contractor was the subject of substantial debate between the parties and M disputed a 'fair and reasonable' extension of time granted by the Architect. M also disputed the loss and expense claim submitted by W on the grounds that it was a global claim and did not sufficiently identify and quantify individual relevant events. It was held for W that the claim was not a global claim. The courts had previously rejected the concept of global claims.

(This case involves the assessment of an extension of time claim and the valuation of loss and expense)

Henry Boot Construction (UK) Ltd v Malmaison Hotel (Manchester) Ltd (1999)

HB and M entered into an agreement under an amended version of the JCT Standard Form of Building Contract (1980 edition, Private edition with Quantities) which provided for HB to carry out design and build construction work for the completion of a hotel. HB gave notice of the intention to refer disputed claims for extension of time to arbitration. In defence M alleged that delays to the contract were HB's own fault, concurrent delays. HB claimed that M's defence was outside the arbitrator's jurisdiction and appealed. The appeal was dismissed.

(This case involves the assessment of an extension of time claim and the allegation of concurrent delays)

University of Brighton v Dovehouse Interiors Limited (2014)

The University employed D to carry out fit out works by a contract incorporating the terms of the JCT Intermediate Building Contract with Contractor's Design 2005 Edition with further modifications. Practical completion was issued 12 weeks later than the date for completion of the works stated in the contract. The parties fell into dispute over D's entitlement to an extension of time to the date for completion; the proper valuation of adjustments to the Contract Sum in respect of instructed variations to the works; D's liability for costs incurred by the University's costs to address incomplete and defective works; D's entitlement to recover loss and expense in respect of delay and/or disruption to the works. D served a notice of adjudication under the Scheme for Construction Contracts and the University claimed that the notice was ineffective to commence proceedings for the purpose of a "conclusive evidence" clause in a construction contract. The Final Certificate was issued but settlement was not reached during the agreed extended period. The University challenged the validity of the first adjudication notice issued by D but the dispute regarding extensions of time, variations, costs to complete and loss and expense remained.

(This case involves the assessment of an extension of time claim and the valuation of variations)

Multiplex Construction (UK) Limited v Honeywell Control Systems Limited (2007)

M, the main contractor constructing the new Wembley Stadium Project, had entered into a contract with the defendant sub-contractor for the design, supply and installation of various electronic systems for communication and control of the building. A dispute arose between the parties as to whether M by its conduct and poor administration had put time at large under the sub-contract. M claimed that the contract provided a mechanism for extending the sub-contract for instructed variations. The declaration granted in favour of the claimant M.

(This case involves the administration of extensions to contract completion)

Henry Boot Construction Ltd v GEC Alstom Combined Cycles Ltd (2000)

GEC and HBC established an agreement to carry out engineering works by a contract under the terms and conditions of the ICE Standard Conditions of Contract (6th edition). HBC claimed entitlement to be paid for variations instructed by GEC under the construction contract. HBC had made a valuation under Clause 52(1)(b) of the conditions but did not use prices from the bill of quantities alleging that the relevant prices contained a mistake. The arbitrator agreed that it was unreasonable to use the contract price which included a mistake as a basis for the valuation and had consequently carried out a 'fair valuation' of his own. GEC appealed and it was held that the bill of quantities rates and prices must stand although having been inserted by mistake.

(This case involves the valuation of variations)

Squibb Group Limited v Vertase F.L.I Limited (2012)

Vertase engaged Squibb to undertake the asbestos removal and demolition of existing structures. The main conditions of contract were the ICE Conditions of Contract Design and Construct, 2nd Edition with amendments and Squibb were sub-contracted to Vertase. The Sub-Contractor was deemed to have full knowledge of the provisions of the main contract. The sub-contract works were completed 12 weeks late and a dispute arose between the parties as to the responsibility for the delay. Squibb issued an adjudication claim for an extension of time and loss and expense resulting from the delay. Vertase maintained that the majority of the delay was the responsibility of Squibb themselves. The adjudicator awarded that Squibb were entitled to an extension of time of 6 weeks and loss and expense accordingly to be paid within 14 days of the date of the adjudicator's decision. Vertase issued a withholding notice against the awarded payment and a further sum for liquidated and ascertained damages. The court was unable to accept Vertases' claim and gave summary judgement for the adjudicator's award.

(This case involved the assessment of an extension of time claim and the valuation of loss and expense)

Costain Ltd and Others v Bechtel Ltd (2005)

C and others, a consortium of companies contracted to carry out work for a rail project under NEC 3. B was one of four companies in a consortium involved in the project management of the construction work. The issues to be determined included when assessing sums payable to C under the contract, it was the project management consortium's duty to act impartially as between the employer and contractor or to act in the interests of the employer and whether the project management consortium had acted in breach of its duty and there had been a breach of the contract. The court held that evidence was insufficient to lay the foundation for a case based on dishonesty and did not show that there were serious questions to be tried.

(This case involved impartiality when valuing variations)

RWE Npower Renewables Limited v J N Bentley Limited (2013)

RWE engaged JNB to carry out civil engineering works under the NEC 3 Engineering and Construction Contract conditions (June 2005 with amendments June 2006). The parties were in disagreement in relation to various delays which had occurred in the completion of the project. The imposition of liquidated damages for an alleged culpable failure by JNB to complete Section 2 of the work on time together with ambiguities between parts of the different contract documents and issues raised as to the precedence of the contractual documents in resolving any dispute. RWE lost the adjudication and the courts awarded part of the extended time disputed.

(This case involved the assessment of an extension of time claim, concurrent events and contract documentation)

Liberty Mercian Limited v Cuddy Civil Engineering Limited (2013)

Liberty Mercian entered into an amended NEC 3 Form of Contract for a development project. LM seeks declaratory relief for specific performance, rectification and / or damages. There is a dispute as to when the contract was entered into and which company had

actually contracted with LM. The matter of which contractor was obliged to deliver a parent company guarantee and also a performance bond and warranties.

(This case involved contract documentation)

Northern Ireland Housing Executive v Healthy Building (Ireland) Ltd (2014)

N was a housing authority which owned various domestic dwellings and contracted with H who provided asbestos management services. The contractual terms were in the New Engineering Contract standard form. At an early meeting between the parties N increased the scope of services required from H. The terms provided that if N gave an instruction changing the scope of the services to be provided by H, that act would constitute a compensation event and N should notify H of that event at the time of giving the instruction. They also provided that if H did not notify N of a compensation event within eight weeks of becoming aware of it, H would not be entitled to a change in compensation unless N should have notified it of the event earlier but had not done so. H referred the matter to adjudication and the adjudicator concluded that whilst N might have intended a statement made at an early meeting, to clarify the scope of services that H should provide, it had in fact constituted an instruction which increased the scope of the works to be undertaken by H beyond that envisaged. Accordingly, he concluded that H was entitled to be compensated for an increased scope of work notwithstanding the eight week time bar provided in the contract terms. N submitted that the scope of the services had not been varied by its instruction and that H's notice of the compensation event had been time barred. The appeal was dismissed on the grounds that N's instruction increased the scope of services to be provided by H and that the time bar for H was an exclusive clause in N's favour and therefore fell to be construed as '*contra proferentem*'. Since N had failed to notify H of the compensation event, N could not argue that H's claim was time barred because H had failed to give notice within eight weeks.

(This case involves contract administration and contract documentation)

Wales and West Utilities Ltd v PPS Pipeline Systems GmbH (2014)

W, a utility company, had contracted with P for the supply and construction of a gas pipeline involving excavating and laying steel pipe in trenches. P was required by the specification to coat the pipes in a protective wrapping where rock was present. P disputed the quantity of rock described in the contract documents and sent an early warning notification of a compensation event under the contract and a claim for additional payment. The matter was referred to adjudication and the adjudicator decided that P had no entitlement to a compensation event in respect of physical conditions including rock, but that it was entitled to an appropriate project manager's instruction in respect of the wrapping material. Seven months after the decision, during which an appropriate instruction was not received, P served a notice of adjudication seeking decisions that it was entitled to a project manager's instruction changing the works information to reflect the increase in wrapping installed and providing assessment of the sum for the compensation event. Judgement was for P following disputes regarding the enforceability of the three adjudications.

(This case involves measurement, valuation, contract documentation and contract administration)

Ferson Contractors Limited v Levolux A. T. Limited (2003)

F had engaged L to supply and fit brise soliel and louvre panelling as a sub-contractor. The sub-contract incorporated the conditions of the standard GC/Works/Sub-Contract with certain amendments. F issued a 'Notice of Withholding Payment' in respect of part of the second interim payment to L. Work was stopped on site and subsequently F purported to determine the contract with L on the basis that L had wrongly suspended its performance of the sub-contract. L gave notice of intention to refer the dispute to adjudication. The adjudicator held that the notice of withholding payment did not comply with the statutory requirements in that it did not specify the ground for withholding and accordingly he found for L. F appealed and the court upheld the obligation to pay in accordance with the adjudicator's decision.

(This case involves contract administration and certification)

SW Global Resourcing Limited v Morris & Spottiswood Limited (2012)

M & S were the main contractor in a contract with Historical Scotland to carry out building works under GC/Works/1. It engaged SW as a sub-contractor. SW referred to adjudication a dispute regarding its claim for disruption costs and loss and expense incurred in the proper execution of the works. After a challenge by M & S regarding jurisdiction and a previous adjudication, SW were awarded a sum in restitution for loss and expense. M & S challenged the adjudicator's award on the grounds of a breach of natural justice and apparent bias. SW were required to give immediate notice of circumstances that were likely to disrupt the regular progress of the works but because there was no benchmark to measure against a serve notice, this amounted to a breach of natural justice. The court stated that the adjudicator's decision is only an interim decision and it is hostile to technical arguments to postpone the enforcement of his decision. The court is only cognisant with the question whether the adjudicator acted unfairly or acted *ultra vires*. M & S's challenge was not upheld.

(This case involves the entitlement to and the valuation of disruption and loss and expense)

John Doyle Construction Ltd v Laing Management (Scotland) Ltd (2002)

L contracted with JD in constructing a new corporate headquarters in Scotland involving a number of distinct Works Packages. JD claimed an extension of time, loss and expense and the final adjustment of the Works Contract Sum. JD alleged that delay was caused by compliance with instructions and not receiving in time necessary instructions, drawings, details and levels duly requested from the Professional Team. It was identified that JD's claim for loss and expense was expressed in the form that has come to be known as a global claim without identifying any causal connection between an event for which the defending party is responsible and each item of loss and expense. The court stated that JD could not say that all of the factors causative of the disruption which resulted in the global claim were the responsibility of L. The necessary foundations for a global claim were therefore absent and there was no rational basis offered for separating out the causal factors for which L was responsible. JD's claim failed.

(This case involves the presentation and valuation of loss and expense)

Motherwell Bridge Construction Ltd (t/a Motherwell Storage Tanks) v Micafil (2002)

The parties had agreed to contract within the spirit of the FIDIC terms. The claimant, C as subcontractor, sued D for moneys due under a contract. D was the contractor on a project to construct an autoclave. During the project there were a number of design changes by D and a change from fabrication in at C's own premises to fabrication on site. C claimed extra costs involved in night shifts undertaken to keep the works on time and the costs of extra works caused by D's alterations to the design and for an extension of time. Held that C was entitled to payment for the design changes implemented by D and for the extra costs of the work done to attempt to finish on time and under the spirit rather than the precise terms of the FIDIC, C was entitled to an extension of time.

(This case involves the assessment of an extension of time claim and the valuation of variations)

AE Yates Trenchless Solutions Ltd v Black & Veatch Ltd (2008)

Y was a specialist engineering contractor engaged to as a sub-contractor by B to carry out directional drilling work to install water mains. No formal sub-contract was signed but the invitation to tender referred to the sub-contract being on the IChemE Form of Contract for Civil Engineering Work, "Brown Book". Y encountered ground conditions which it claimed delayed and disrupted the work and claimed entitlement to compensation under the sub-contract terms. The main dispute was whether Y's terms and conditions included a specific ground conditions clause. The court found that the general conditions of contract take precedence over Y's quotation ie. The "Brown Book" took precedence over the terms and conditions of Y's quotation where the two conflicted.

(This case involved contract documentation)

Amec Group Limited v Secretary of State for Defence (2013)

Amec was engaged by the Secretary of State for Defence to carry out the design and construction of a facility to support nuclear submarines in Scotland. The contract is a Maximum Price Target Cost Contract, the actual standard form is unspecified in the commentary but could be NEC. There were extensive cost and time overruns on the project and the parties fell into dispute. The project employed a Dispute Review Board (DRB) who had not previously encountered where a substantial overrun had reached a ceiling and referred to the unusual and badly- worded provisions of the contract. There were two issues between the parties; whether the respondent should pay anything at all once the costs had reached the Maximum Price and if the respondent was liable to pay when the cap was reached, what precisely did it have to pay; actual costs or any costs. A referred the questions to adjudication and the adjudicator concluded that the respondent was liable to pay once the costs exceeded the Maximum Price plus the cap, but that cost was limited to actual costs properly incurred in excess of that figure. A challenged the adjudicator's decision claiming that it was entitled to any costs. The challenge was not upheld by the court.

(This case involved contract documentation and valuation of change)

Multiplex Construction (UK) Ltd v Cleveland Bridge UK Ltd (2008)

The claimant contractor M claimed damages against the defendant sub-contractor B for breach of contract. M was the main contractor for construction of the new national Stadium at Wembley and B was the steelwork sub-contractor. Each party lost confidence in the other and B eventually repudiated the sub-contract. The court had decided preliminary issues but the parties could not agree quantum and asked the court to determine the total sums owed by M to B for work done and materials supplied. The overall result was that B had to pay M in excess of £6M in respect of overpayments previously made by M, damages for breach of contract and interest.

(This case involves the management of relationships and the correct valuation of variations)

Balfour Beatty Construction v Serco Limited (2004)

This is an application for summary judgement to enforce an adjudicator's award. The claimant B started work and delays concerning major environment impact issues occurred which held up progress of the works. B maintained that the whole episode arose from events and changes for which Serco were responsible. Accordingly, B made claims for extension of time and claims for loss and expense as a result. B submitted 18 claims which S rejected and B issued a notice of referral. The adjudicator allowed 7 of the 18 claims made by B and directed that S should pay B £620K. S refused to pay the sums due under the adjudicator's decision and explained its reasons in a letter claiming that practical completion under the contract had not been received and that liquidated and ascertained damages would exceed the sum payable to B under the adjudicator's decision. B applied to the court to enforce the adjudicator's decision and succeeded but S's entitlement to liquidated and ascertained damages remained a matter to be resolved on a future occasion unless the parties were able to reach an agreement.

(This case involves the assessment of extension of time claims, valuation of loss and expense and contract administration)

Alstom Signalling Ltd (t/a Alstom Transport Information Solutions) v Jarvis Facilities Ltd (2004)

The claimant S, the main contractor in a project for the construction of a railway extension, sought a declaration regarding the terms of a sub-contract for part of the work with the defendant J. there was a dispute about whether the pain gain payment terms had been included in the subcontract. J had completed the work and maintained that it was entitled to be paid a reasonable price for its work; and that no account should be taken of failed targets between the parties to the main contract. S claimed that a pain gain provision had been included in the agreement and a contribution towards its losses was due from J. The declaration held that S and J had agreed to the pain gain mechanism, but no agreement had been reached as to the extent and manner in which it would operate.

(This case involves contract documentation and valuation of change)

5.3. Case Law - Negligence and the quantity surveyor

Ansell and McCafferty (2017) presented a paper to the Society of Construction Law which reviewed recent cases of alleged negligence on the part of quantity surveyors acting in various capacities for construction clients in the built environment. The paper considers cases from four areas of practise for quantity surveyors:

Pre-construction and construction phase services: cost estimates.

Construction.

Construction phase services: valuation and cost monitoring

Services provided away from or outside the project.

The 5 cases decided between 2006 and 2015 are reviewed as follows:

Ampleforth Abbey Trust v Turner and Townsend Project Management Ltd (2012)

The Trust engaged TTPM to act as project managers on three construction projects. One of the three contracts completed 15 weeks late and that no formal contract had been issued. The Trust claimed that TTPM had not acted with reasonable skill and care and had prevented the Trust from rightfully withholding liquidated damages from the contractor. The court decided that a breach of duty by TTPM had caused the Trust loss.

William Clark Partnership Ltd v Dock Street PCT Ltd (2015)

Clark provided quantity surveying and project management services to Dock Street. Clark claimed outstanding fees and Dock Street maintained that Clark had failed to control a considerable overspend on the project in question. Dock Street alleged that Clark did not set a budget, did not provide a cost plan, failed to undertake competitive tendering, failed to advise on guaranteed maximum price and failed to manage the contractor's possession of the site. The court held that Dock Street was entitled to a deduction from Clark's fees.

Plymouth & South West Co-operative Society Ltd v Architecture, Structure and Management Ltd (2006)

Plymouth stated an overriding concern to keep costs within a budget limit of £5M, the final account figure was £2.8M over the initial budget. The court was very critical of ASM's conduct during the project and awarded Plymouth a substantial part of the cost overrun.

The court particularly criticised ASM regarding:

Procurement advice.

Cost control.

Valuation of variations.

Cost budget advice.

Record keeping.

Poor documentation.

Dhamija v Sunningdale Joineries Ltd (2010)

D sought damages arising out of alleged defects in the design and construction of a house. In this case McBains, acting as quantity surveyors, were third defendants. There was no written contract between D and McBains and no evidence of an oral contract except a number of letters which confirmed McBains appointment. D alleged overvaluation by McBains and the valuation of works not properly executed. The court decided that McBains should have acted with the reasonable skill and care of quantity surveyors of *ordinary* competence. The court held that the quantity surveyors fell below the standard to be expected of ordinary competent quantity surveyors found for D.

Lloyds Bank plc v McBains Cooper Consulting Ltd (2015)

The Bank claimed damages for breach of contract and/or negligence from McBains acting as project monitor for a development to be used as a church. After 21 months the Bank's facility was virtually exhausted and the development was far from complete. McBains had warranted to the Bank that it took to exercise reasonable skill and care to be expected of a monitoring surveyor including the valuation of construction works. The court decided that

none of the breaches of duty by McBains caused the Bank any loss until it failed to advise the bank of a £10K overspend in Progress Report No.10. The Bank suffered a total loss of £1.4M and the court noted the following omissions by McBains in carrying out its duties as project monitor:

Applications for payment not properly assessed or reported to the Bank.

Construction work not valued properly

Only three visits to site were made when 18 were required by the Bank.

The project monitor was reckless when compiling progress reports.

All of these cases suggest that the level of quantity surveying competence demonstrated during the crystallisation of conflict and dispute was less than convincing for the parties to be able resolve their issues without intervention by the courts. The details of these 21 cases decided between 1999 and 2014 and five cases involving allegations of negligence decided between 2006 and 2015 have highlighted the following issues relating to quantity surveying practice:

Assessment for Extension of Time to contract completion – 8 issues.

Valuation of Loss and Expense – 5 issues.

Valuation of variations – 9 issues.

Errors in contract documentation – 7 issues.

Measurement – 1 issue.

Administration – 2 issues.

Poor standards of:

Cost control

Procurement advice

Valuation of construction works

Contract documentation

- Contract administration
- Cost budget advice
- Record keeping
- Client care
- Professional conduct
- Reasonable skill and care

Ansell and McCafferty conclude that claims against quantity surveyors are increasing and their research indicates that this trend will continue. This research questions whether quantity surveying practitioners have received and have obtained appropriate levels of professional education and training that preclude the foregoing deficiencies in professional practice. The rising trend in claims against quantity surveyors may indicate falling professional standards, inadequate professional education and a decline in the quantity surveying profession.

5.4. Summary of the Chapter

The sharp reality of litigation that is the result of questionable quantity surveying practise issues serves as reminder of how important competence in practise is for the profession. This chapter has identified aspects of practice, professional knowledge and expertise that have been challenged by by clients and referred to the courts for resolution. Using case commentaries the chapter explains details of practice shortcomings that are later matched with the policies and procedures of RICS professional education and training for quantity surveyors for analysis and discussion. Litigation involving professional practice is contingent upon the level of professional expertise and competence, this chapter illuminates the extreme consequences of poor practice standards in quantity surveying.

6. METHODOLOGY AND METHODS – PHILOSOPHIES

6.1. Introduction

This chapter introduces the research philosophies that underpin the research. The concepts are supported by the research hypotheses which are explained in Section 6.5 that follows later in the chapter. The explanation demonstrates how the constituent parts of hypotheses interact with each other and how they are tested by empirical data and how they relate to research literature. The chapter continues by identifying the methodology that is applied to this scientific enquiry of human interaction and explains the means by which answers to the research questions are developed. Philosophies and established research paradigms that inform the methodology are introduced and the chapter closes with an explanation of the conceptual framework that has driven this research.

6.2. Research Methodology

The methodology for a research project is described by Grix (2010) as a philosophy of science that considers methods and techniques of scientific enquiry with particular characteristics that are most applicable to a research project. Other scholars, (Trafford 2008; Smith 2009; Maxwell 2013 and Creswell 2013) suggest wider definitions and refer to the following range of theories: a rationale and philosophical assumptions that support a particular study; the researcher's assumptions about reality relative to the research; identification of what kind of knowledge is relevant for a particular research project and whether it will be seen as valid; a concept to be explored and techniques that will be used to investigate a phenomenon; a research design that identifies a strategy which in turn informs the choice of methods; the terminology and processes of research; the philosophy and structure of a research project that fundamentally connects with the process and objectives of the study. These are all embracing theories that can apply to any research project but most importantly the research design should reflect the characteristics of the research.

This research project investigates the professional practice of quantity surveying and its relationship with the programme of education and training designed, administered and regulated by RICS. This thesis argues that there is disconnect, a gap, a mismatch between the knowledge and training promoted by RICS and the reality of practice scenarios encountered by practitioners. The research investigates concepts that comprise this perceived problem of practice and the author has chosen to focus on practitioners themselves as a source of empirical data that tests the hypothesis. A research objective is to understand and explain the hypothesis from a practitioner viewpoint. Applying this objective to accepted methodological conventions prompts the following observations of choice: experiment is not appropriate, an ethnographic approach is impractical for the author, the research concept does not support phenomenology, grounded theory or action research and case study were considered to be too narrow. Therefore survey and interview techniques have been chosen which give more immersive data and more fine grain detail as a means to gather empirical data that furthers the research argument and answers the research question.

6.3. Research Philosophy

The author's own perception of social reality and what is considered by the author to be an issue that should be researched; what exists, what it looks like and concepts and hypothesis that comprise its entity are driven by a branch of metaphysics which is known as Ontology. This philosophy primarily addresses the nature of being and what exists, that we might acquire knowledge of, a view of the world that attracts investigation and potentially will provide a source of new knowledge. A research project commences with an ontological position or world view. The theory that informs the nature of knowledge necessary to acceptably research a particular ontology of a subject or problem or issue are the theories of epistemology, the theory of knowledge. Epistemology is concerned with what the particular knowledge consists of; the status that can be ascribed to that knowledge; what type of knowledge will be obtained by the research and what characteristics that knowledge

will have. Both these philosophies influence the methodology of a research project, (Trafford 2008; Smith 2009; Maxwell 2013; Creswell 2013).

6.4. Research Paradigms

The paradigms of research are defined as generally accepted research conventions or recognised approaches which establish the philosophical position of a research project, which in turn informs the adopted research methodology and methods. A brief synopsis of these generally recognised conventions is included here to clarify the concept of paradigms and illustrate through their definitions that the presence of homonyms and synonyms simply adds to the confusion that exists in their use, (Crotty 1998; Trafford 2008; Gill 2010; Creswell and Plano Clark 2011; Ahmed 2016; Bryman 2016).

Briefly research paradigms are explained as follows: **Foundationalism** views the world as existing independently of our knowledge of it. Knowledge rests on indisputable truths. **Positivism** regards knowledge as being based on empirical theory applying scientific methods to human affairs, objective enquiry. **Critical realism** seeks not only to explain social reality but also interpret and understand what is not immediately apparent as pre-existing structures affect and are affected by social actors. **Pragmatism** in searching for meaning accommodates and compromises with openness and optimism. Pragmatists have a plural approach to research whilst holding an interpretive view, they focus on the outcomes of research by whatever means are most suitable. **Interpretivism** is an explanatory understanding of ontology, subjectivity. **Objectivism** regards meaningful reality to be apart from consciousness. **Subjectivism** maintains that meaning is imposed on the object by the subject, dependent and independent variables. **Empiricism** states that meaning is based on observation, experiments and/or experience rather than ideas or theories received through the senses. **Constructionism** states that truth or meaning exists through our engagement

with realities. **Symbolic interactionism** believes social interaction as taking place in terms of the meanings that actors connect to action and things.

Research philosophy is explained by Saunders et al (2012) as being concerned with a set of ideas regarding the generation of knowledge, what type of knowledge is generated and the essence of realities connected with that knowledge. The research 'onion' devised by Saunders et al helps to demystify 'a conflation of terms in the textbooks' referred to by Ahmed et al (2016) and in particular, regarding this research, the nature of knowledge required in pursuit of its aim and objectives. Saunders, in the philosophy layer of the onion, refers to the ontologies of realism, interpretivism, and positivism together with the epistemologies of pragmatism/constructionism.

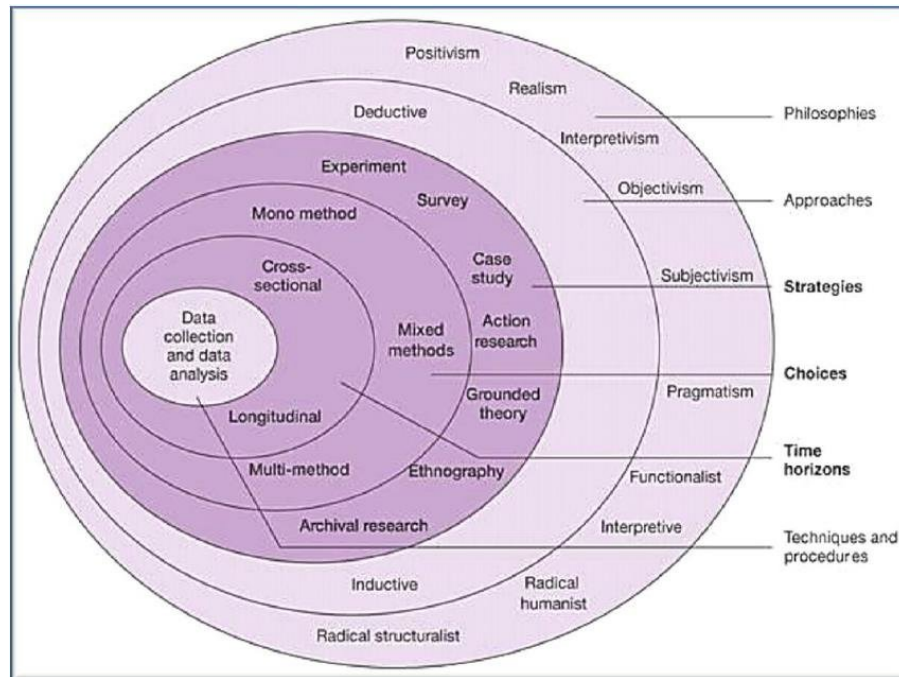


Chart 6.1. Research Onion Reproduced from Saunders et al (2012)

The philosophical perspectives for this research project are constructionist about the experiences of chartered quantity surveying practice and professional education;

assumptions made about how reality in this professional world as viewed by those involved. This research project aims to evaluate, understand and interpret the reality of chartered quantity surveying practice and professional education and training promoted by RICS, but particularly evaluated from the perspective of the practitioner. The research is designed to create information that can be justified to produce knowledge that can then be used to explore research concepts raised in Section 6.11. It is anticipated that practitioners participating in the research will characteristically articulate a disparate range of personal views from the reality experienced in practice situations; and have their own particular interpretation of the value of their professional education relative to those practice experiences. This perspective from the bottom up is likely to generate good data on the research question of how effective is professional education for quantity surveyors.

The epistemology of this research scenario draws upon the paradigms of both objectivism and subjectivism, in that meaningful reality for this research requires the input of consciousness but reality for this project can also be an independent entity, Crotty (1998). The ontology of realism, where reality exists outside the mind, can also contribute to the nature of knowledge generated to understand the research objectives. However, whilst the research will take the epistemological position of constructionism, which assumes that the researcher will engage with the realities of the professional world under consideration, it could also consider objectivism, where meaningful reality exists outside consciousness, Creswell (2013). Meaning, for this research, can therefore be discovered and it can also be constructed and different practitioners responding to the research may construct meaning in different ways.

Combining with a subjectivist epistemology, meaning is created and ontologically is a social construct, which changes, depending on who is viewing the particular circumstance where the construct exists only in the mind of the viewer. However, the paradigm of positivism also has a place here and discrete reality has a part to play in fathoming this research

scenario. The ontology of interpretivism recognises reality as the product of processes where social actors together negotiate the meanings for actions and situations; and clearly in this research, it is applicable for the interpretation of circumstances under which practitioners engage in the administration and management of construction projects (McKenzie et al 1997; Crotty, 1998; Trafford and Leshem, 2008; Smith, 2009; Creswell, 2013; Maxwell, 2013; Ahmed, 2016; Bryman, 2016). In summary, this research can benefit from both sides of the paradigm spectrum gathering data with an objectivist approach and interpreting reality subjectively.

6.5. The Research Hypothesis

Previous sections of this chapter have discussed generic aspects of research philosophy and research approaches but at the same time have introduced justification for the philosophical positions, methodology and methods particularly adopted for this research. The project is designed to evaluate the professional practice of chartered quantity surveyors and its relationship with RICS professional education and training. The research poses a question as to whether RICS education and training gives the practitioner sufficient tools of knowledge and competency to deal with practice-based issues encountered during the construction phase of projects in the current built environment. This research sits at the intersection of professional practice and professional education. The evaluation adopts the lens of practitioners' own experiences as a source of data that establishes, in reality, what is out there, what is actually experienced by practitioners in the rigors of practice. The data gathering techniques are chosen around subjective paradigms but at the same time the research philosophy and theoretical approaches are selected to enable value-free conclusions. This research is looking at the consequences of 'every day' for chartered quantity surveying practitioners.

This doctoral research grew out of the author's observation and experience of chartered quantity surveyors practising as part of project teams. Problems from issues of conflict, dispute and risk were often exacerbated by levels of knowledge, expertise and competence demonstrated by quantity surveying practitioners. Reflection in practice and a personal desire to continually supplement education and training compared with a conflicting view of the real world revealed a topic worthy of further investigation in the field of professional practice by quantity surveyors. The ontology of this notion is the belief that there exists disconnect between professional practice and professional education. Aspects of the real world that are relevant to this particular perceived problem comprise a range of concepts about which the author has developed hypothesis which are tested through the research methodology.

The concepts and hypothesis are explained as follows:

Based on findings from research literature it is hypothesised that ***the professions*** are perceived as self-serving organisations that do not uphold their social responsibilities, ethos, principles or commitment to their members and the public and they have forsaken the 'grand bargain' once made with society. This hypotheses is tested by a self-administered survey and semi-structured interviews conducted by and with chartered quantity surveying practitioners.

Based on findings from research literature it is hypothesised that ***professional knowledge*** is misunderstood and transferred with insufficient cognition for the demands of practice reality. This hypotheses is tested by a self-administered survey and semi-structured interviews conducted by and with chartered quantity surveying practitioners.

Based on findings from research literature it is hypothesised that ***professional competence*** is ill-defined on a continuum that does not sufficiently address the demands of practice. This hypotheses is tested by a self-administered survey and semi-structured interviews conducted by and with chartered quantity surveying practitioners.

Based on findings from research literature it is hypothesised that **quantity surveying** is professional expertise that could make a more meaningful contribution to business, commerce and the public and private sectors of the economy by improving its own programme of education and training and raising levels of professional competence. This hypotheses is tested by a self-administered survey and semi-structured interviews conducted by and with quantity chartered surveying practitioners.

Based on findings from research literature it is hypothesised that **RICS education and training for quantity surveyors** is not sufficiently relevant for the demands of current industry practice. This hypotheses is tested by a self-administered survey and semi-structured interviews conducted by and with chartered quantity surveying practitioners.

Based on findings from research literature it is hypothesised that **problems from practice-based issues faced by quantity surveying practitioners** are often poorly administered by practitioners who do not have the knowledge, expertise and competence to address and resolve these problems. This hypotheses is tested by a self-administered survey and semi-structured interviews conducted by and with chartered quantity surveying practitioners.

6.6. Research

Empirical social research is often taken for granted and those not involved consider it to be an esoteric expression of the intellectual elite which has little bearing on the reality of life. Research is in fact the means to ask questions, to provide answers to problems and generate new knowledge. The concept of research, when explained by scholars, has predictably generated different conclusions, each with a different emphasis, for example Gray (2014) states that research is an organised process that will generate new knowledge from systematically investigating a particular concept. Ahmed et al (2016) believes that research is an inquiry that generates new opinions which make an impact and bring about change. Fellows and Liu (2008) assess that research is a careful search, an investigation, a systematic investigation towards increasing the sum of knowledge. The Economic and Social

Research Council (ESRC) defines research as ‘...any disciplined inquiry that aims to contribute to a body of knowledge or theory (ESRC, 2007, cited in Fellows and Liu, 2008). Particular to social science research, Punch (2014) considers that research amounts to collecting data about the world and building theories about that data.

This research is cognisant of these substantive theories and seeks to evaluate matters of professional education and practice for quantity surveyors in order to develop recommendations as a guide for improving professional education and professional standards. The recommendations will take account of the demands of professional practice recognised by existing literature and reflections from practice by the author. The purpose of this research is twofold. Firstly it contributes to existing debates in literature about the professions and professional practice and secondly, it offers a practical impact in the form of an evaluation of professional education and training for chartered quantity surveyors from the perspective of the practitioner.

6.7. Research Design

The design of a research project involves creating a plan of action, an overarching plan that is a foundation and a structure for the project that will answer the research questions, (Maxwell 2013; Ahmed et al 2016). Each component of the structure is interconnected and has a purposeful relationship with the others. Maxwell identifies five components which apply to specific areas of the research namely: goals, conceptual framework, research questions, methods and validity. Creswell (2013) goes further and explains that research design encompasses the whole research process from conceptualising a particular problem to data collection, analysis, interpretation and conclusions; a plausible iteration that connects the empirical data with research questions and a final conclusion. The author, from a long career in quantity surveying and from those of peers, has identified disconnect between the professional practice of quantity surveyors and education, training and

practice knowledge that has been acquired from RICS education and training policies. The perceived disconnect prompted a doctoral study that tested the hypothesis by adopted research methodologies and methods.

Therefore the plan of action for this research project involves an examination of the professions, professional knowledge and competence; the profession of quantity surveying; RICS and its programme of education and training designed and regulated for quantity surveyors. The thesis, in Chapter 4 establishes the nature of practice-based issues existing in the realities of practice that quantity surveying practitioners are required to address. Knowledge for this part of the research project is drawn from current research literature in the field and the work of others. The issues raised by current literature are tested by the empirical part of the research which involves the practitioners themselves. The empirical part of the plan bypasses the curriculum of knowledge which is assumed and expected to have been acquired by quantity surveying practitioners and asks, in reality exactly what practitioners know in order to address the issues identified by current literature and the author's own reflection of practice. At the same time practitioners will also be asked about their experiences from professional education and the relevance of that education and training in relation to the realities of practice.

6.8. Research Theories

Research theories embrace and influence philosophical assumptions made in developing and designing a research project. Referring to research theories Runeson and Skitmore (2008) explain the theory of '*Natural Sciences*' stating that it is about physical entities which could be: electrons, molecules and electric charges. They illustrate their observations by pointing out that molecules and electrons do not think and therefore '*Natural Science*' theories and methods of understanding do not reach beyond the entity itself. Dainty (2007, cited in Knight and Ruddock, 2008) states that '*Natural Sciences*' methods and theories used

to study social phenomena can explain human behaviour but without an empathetic comprehension of human actions. Conversely Creswell (2013) explains the theory of '*Social Science*' by stating that it addresses matters of leadership, attribution, political influence and control and many other phenomena. Bryman (2016) in considering '*Social Science*' states that '*Social Research*' relates to an enquiry into '*social scientific*' fields such as sociology, human geography, social policy, politics, and criminology. Social research is therefore motivated by how society interacts and influences social change employing social scientific theories to explain and understand these changes.

Social science research is believed by Somekh and Lewin (2011) to address the circumstances of people in their real-life situations raising philosophical questions regarding the nature of knowledge, truth, value and being, all of which influence human opinions, decisions and action. In contemplating particularly the construction industry, Runeson and Skitmore (2008) reflect that construction management is mostly about people, interacting with other people. This research project aims to understand and evaluate human experiences in situations where the outcome of a construction project depends upon a disparate collection of individuals collaborating and/or interacting in circumstances of an itinerant nature to complete a one-off product. The aim and objectives for this study therefore favour the theories of '*Social Science*'.

6.9. Research Approach

The researcher, when designing a research project, has the choice of two different research approaches, deductive and inductive. Ahmed et al (2016) refers to these as ways of reasoning to fulfil the research aim and objectives. An inductive approach develops a theory from specific observation whereas a deductive approach tests a theory. Fellows and Liu (2008) explain the approaches of deduction and induction as being a means by which knowledge is evolved. Lee (2008) refers to deduction and induction as being concepts that

are fundamental in considering a research project. Similarly using Aristotle’s inductive-deductive representation, deduction is explained as a procedure that develops conclusions from existing theory, testing theory by gathering real-world data. Induction begins by collection data which is analysed to produce a new general theory. Grix (2010) considers that deduction is theory-driven research and induction develops conclusions from specific empirical data which lead to new ideas and theories. Therefore this doctoral research is aligned with inductive research.

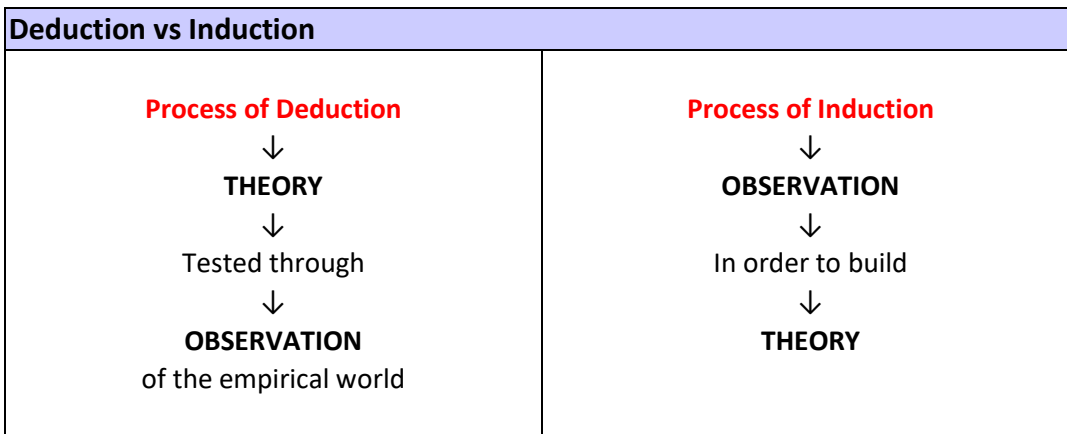


Chart 6.2. Deduction vs Induction Reproduced from Gill (2010 p.7)

Reasoning that recognised theory is also referred to by Saunders, Lewis, and Thornhill (2012) and when a theory is tested with new data it is a deductive approach and investigating a topic to develop a new theoretical explanation is an inductive approach. Creswell (2013) recognises complex reasoning that is applied to research when adopting the rationale of deduction or induction and how induction is a ‘bottom up’ approach to research whilst deductive thinking continually tests developing themes from new data. Bryman (2016) in describing the elements of social research explains that the contrast between deductive and inductive approaches impacts upon concept for research. A study may start with a problem around which data is collected to further explain the problem or alternatively concepts or theories are the result of new research data collected. Therefore an inductive approach has been chosen here as the author for this study has hypothesised a problem that is considered suitable for investigation. In order to facilitate this enquiry new data has been gathered as a basis for the development of new theory.

6.10. Research Strategy

The overall plan for a research project can include any one of these widely accepted research strategies, which Crotty (1998) refers to as methodologies:

Experiment,

Survey,

Ethnography,

Phenomenology,

Grounded theory,

Action research,

Case study

Discourse analysis

(Crotty 1998; Stanley and Wise 2008; Knight and Ruddock 2008; Smith 2009; Creswell 2013; Ahmed et al, 2016)

As previously stated in Section 6.2 the author for this research favoured data gathering techniques that involved contributions directly from practitioners and a mixed method approach that provides a dual and complimentary data set. Survey and interview techniques produce respectively hard quantitative data supported by softer qualitative data from the author's personal engagement with the participating practitioners.

6.11. Conceptual Framework

The conceptual framework for a doctoral research project is considered to include concepts generated by current literature in the field; assumptions made by the researcher regarding the world in which the research field is situated and by the reflection in practice from the

researcher's own experiences, Trafford and Leshem (2008). Research is not conducted in a vacuum and Fellows and Liu (2008) amongst others recognise that the context of the researcher's particular specialisation, motivation, expertise and experiences of human interaction will influence the choice of the goals, aim and objectives for a research project (Crotty, 1998; Smith, 2009; Grix, 2010; Maxwell, 2013; Bryman, 2016). As a practising quantity surveyor the author has insight into the skills gap left by professional training.

6.11.1. Concepts from current research literature and theory in the field

Current research literature in the field of professional practice, education and training for chartered quantity surveyors contains descriptions of a number of issues that have driven the conceptualisation of this research project, for example, (Ramus (1981); Turner, 1983; Male, 1990; Cornick and Osbon, 1994; Diekmann et al. 1995; Seeley, 1997; Nkado and Meyer, 2001; Ashworth and Hogg, 2008; Lee et al. 2011) identify and describe what types of knowledge and expertise should be in place for quantity surveying practise but these and other studies do not provide evidence that this professional knowledge and expertise has actually been acquired by the practitioner. The changing requirements of professional knowledge that is considered to be currently appropriate for practice is recognised by other scholars which merely adds to the inventory of that which is identified as being currently necessary to practise (Nkado, 1999; Fan et al. 2001; Cheung and Suen, 2002; Glover and Fenwick Elliot, 2005; Cheung and Wing Yiu, 2006; Ashworth and Hogg, 2008; Cheung and Hoi Yan Pang, 2013) but practitioners have not been consulted as to whether they have actually acquired this knowledge. The current state of understanding is that much is known about the prescribed curriculum, but the reality of how this relates to practice remains poorly understood.

Chappell et al (2009) asks whether professional education is sufficient to resolve current problems of practice. Buchanan (2012) claims that professional education does not engage with current critical realities nor does it prepare students for the future in which they will practice. Dulaimi (2004) identifies that changes in business trends require more effective

professional education. Chan et al (2002) propose that the needs of practising professionals and the vision of academics do not necessarily coincide. According to (Diekmann and Girard 1995; Kumaraswamy 1997; Turner 1999; Shorland 1999; Turner and Simister 2001; Turner 2002; Bingham 2010; Cheung 2013 and Breyer 2013), a lack of professional knowledge and expertise demonstrated by practising quantity surveyors is a common problem. Yet these comprehensive studies appear to be out-with the practitioner and offer minimal engagement with the concept of how professional education works in practice. This research offers a new academic approach – from the bottom up – to place the practitioners' experience at the heart of the enquiry

6.11.2. Concepts from reflexive statements made about the world in which the research field is placed

The author's professional experience as a quantity surveying practitioner commissioned in a support role to assist in resolving issues encountered on failing contracts and matters of dispute and conflict on various projects has provided cognisance of chartered quantity surveyors in practice situations. This informal conception is derived from the apparent lack of knowledge, expertise and competence in dealing with practice-based issues which eventually led to matters of dispute and conflict and circumstances which caused some projects to fail; engendered the personal assumption that professional education and training promoted by RICS for chartered quantity surveyors did not necessarily address current issues being encountered during the construction phase of projects in the built environment. The RICS "chartered" designation did not appear to guarantee a competence to practise, sufficient to enable a practitioner to properly administer and manage the interests of parties to a construction contract.

6.11.3. Concepts from reflection in practice

The author is a practitioner-scholar. The category of practitioner-scholar undertakes research that is carried from within a particular field of practice. The practitioner scholar identifies issues that are considered to be relevant enough to be understood and explained for the benefit of practice standards and practice development. Research carried out by a

practitioner scholar attracts different epistemologies and ontologies from those which are associated with tradition post-graduate research projects Schön (1983); Chynoweth (2013). Traditionally a scholar undertaking a doctor of philosophy (PhD) research project approaches a subject from the outside looking-in, notwithstanding ethnographic research techniques the researcher remains external to the problem being researched. A practitioner scholar identifies an issue worthy of investigation from within a field of practice and from sustained reflection and analysis in practice. This immersive view facilitates more in-depth knowledge of the research topic is the basis of working assumptions for this research.

The author has acquired knowledge of quantity surveying education and practice from a diverse range of work experience and developed a view of a reality that spans over 50 years of practice in construction and quantity surveying. Acting in a support role where dispute and conflict have developed between the parties and witnessing how the respective teams address these problems has contributed to the author's world view of chartered quantity surveying practice standards. Practice experience also includes commissions involving failing projects and practical commercial and contract support in project rescue. Experience of professional education and training for chartered quantity surveyors includes an ongoing role as an accredited RICS Assessment of Professional Competence (APC) assessor which spans over 20 years. More recently providing seminars and workshops for undergraduate apprentices preparing for the RICS APC combined with a role as counsellor for more than ten APC candidates. The author is also a registered tutor/marker for the Chartered Institute of Building (CIOB) examinations.

Reflection from over forty years practising as a chartered quantity surveyor and upholding a personal ethos of life-long learning, the author perceived a skills gap that is apparent in the reality of practice. Reflection in practice suggests that Mandatory Continuing Professional Development (CPD) discussed within Section 2.6.7 of Chapter 2, has a limited value and impact in developing and expanding the practitioner's knowledge and expertise when the

minimum requirement by RICS for chartered members is set at ten hours of formal training across each calendar year. The subject matter for formal training is at the discretion of the practitioner and could involve an arbitrary selection of topics of little relevance to the furtherance of professional knowledge and expertise. This, amongst other observations from reflection in practice fuelled a personal doubt regarding the sufficiency of RICS regulated training and education and the extent to which it equips practitioners for the rigours of real practice situations.

6.12 Summary of the Chapter

The chapter has explained the methodology adopted for this research project. It has established the philosophical stance and the research paradigms that support this quest for new knowledge regarding the education and practice of chartered quantity surveyors. Section 6.5 reviewed the research hypothesis and concepts that comprise the hypothesis. Later sections of the chapter discussed aspects of the research design including the theory and approach which has been adopted by the author. The chapter concludes with an explanation of a conceptual framework that supports the project.

7. METHODOLOGY AND METHODS – TECHNIQUES

7.1. Introduction

This chapter addresses the methods/techniques chosen by the author to capture data about social realities of the research hypotheses. Theories behind the design of empirical aspects of the research are justified with references from current research literature. Sources of data and sampling techniques are explained together with methods used to analyse that data. The chapter explains why these approaches are considered to be the most suitable for the project, drawing on relevant current research literature and following the work of other researchers in support of these choices and at the same time demonstrating the author's understanding of scholarly research. A mixed method approach is discussed in relation to the research aim and objectives. Interviewing techniques are established and the use of Computer Assisted Qualitative Data Analysis Software(CAQDAS) is introduced.

7.2. Research Techniques

There is arguably a “haze” surrounding scholarly definitions of research methodology and methods, for example Ahmed et al (2016) refer to ‘*a conflation of terms in the textbooks*’ however Smith (2009) is clear that *Methods* mean particular techniques and tools or procedures chosen by the researcher to gather data for research. Others go further, Maxwell (2013) considers that *methods* should explain what the research is going to do; what techniques will be used to collect and analyse data and sampling procedures. Crotty (1998) refers to ‘*concrete techniques or procedures*’ that are proposed to be used in gathering and analysing data. Bryman (2016) is more expansive in considering methods which he feels are not ‘*neutral tools*’ but are part of how researchers cognize social reality and how they propose to interrogate its meaning. Grix (2010), in a Glossary of Research Terms, explains that the intrinsic Greek meaning of ‘method’ was ‘the pursuit of knowledge’ however, in present day research terms Grix (2010) also refers to the methods or techniques and procedures, a researcher uses in a project to collect and analyse data.

7.3. Quantitative Methods

The practical characteristics of quantitative research methods referred to by some scholars as a methodology and by others as a method, has clear implications for the practice and procedures applicable to a research project Bryman (1984). Bryman explains that his use of the term methodology in relation to quantitative or qualitative research refers to their relative epistemological positions rather than techniques for data gathering. Quantitative methods, when applied to social research, are subsequently described as a natural science approach to a subject with an ontological position of positivism which means there is one truth out there available to be discovered. Lee (2008) refers to the different types of quantitative data collection techniques to be; a questionnaire survey, experimental designs and using sources of secondary data, depending upon the research field being addressed, Fellows and Liu (2008) agree that quantitative methods usually involve the paradigm of positivism in that they gather factual data that is measured and using scientific techniques produces quantified data.

The application of a variety of quantitative methods for social science research topics are explained by Somekh and Lewin (2011). They suggest that quantitative methods are valuable in a research project because of the unreliability of human reasoning; in particular, questionnaires, when used in a qualitative or mixed methods approach, provide credible support for a constructionist, subjectivist epistemology. Research by Gray (2014) identifies that quantitative research is characterised by the lack of contact with people and the places in which they experience life issues. Bryman (2016) describes quantitative research as involving the gathering of numerical data which takes a deductive view between theory and data. Having said this, Bryman suggests that a quantitative approach in social research offers more by its different epistemological and ontological positions. Natural science applied through the epistemology of objectivism and the ontology of positivism. Ahmed et al (2016) refers to the reliability, validity and scientific methods involved in quantitative research which are considered to be its strengths. Quantitative research is objective in

understanding reality involving structured interviews, structured surveys, symbolic models and physical experiment.

7.4. Qualitative Methods

A qualitative research method looks at a worldview through the lens of those participating in the action where behaviour is the subject of interpretation, understanding and meaning in the context of particular systems and procedures Bryman (1984). Qualitative methods accompany constructionist and subjectivist paradigms Crotty (1998). Qualitative research methods are defined by Cassell and Symon (2004) in terms of what good qualitative research should evidence for example; an appreciation of context, researcher engagement and the existing theory being interrogated. Fellows and Liu (2008) demonstrate that qualitative methods identify that meaning is socially constructed and is undergoing continuous change which requires cognisance of social interactions. Grix (2010) explains that qualitative methods are more interpretive in the examination of characteristics from social interaction. Saunders et al (2012) also refer to an interpretive philosophy where the researcher needs to understand social meaning in its natural setting.

Qualitative research, when considered by Denzin and Lincoln (2013) is referred to as exploratory and subjective, a 'soft' science that locates the researcher in the field of study, participants are in their natural settings where the researcher attempts to understand and interpret a particular phenomenon. Gray (2014) states that qualitative research is contextual and can explain how and why situations occur taking account of human emotion, motivation, prejudice and conflict. Ahmed et al (2016) identifies that qualitative research examines experiences, opinions and feelings of participants to the research. Bryman (2016) considers that qualitative research relates to words rather than numbers. Qualitative research is therefore clearly appropriate to a context in which the research subjects' viewpoints/beliefs/experiences are sought as data.

7.4.1. Qualitative Interviewing

Interviewing is one of the most common methods of data collection employed by researchers at all levels of enquiry. Despite its frequent use the technique requires a certain skill and expertise to be successful. Haigh (2008) describes a negotiated partnership which comes with particular difficulties, complications and demands upon the interviewer. The process is part of social research and therefore, involves people, the researcher and the participant. The researcher, when asking questions and to an extent interrogating opinion, experiences and insights, must be cognisant of the need to answer research questions. The interview should be complete, accurate, and administered with tact, consideration, respect and confidentiality. Haigh (2008) refers to the relationship between the researcher and the respondent and how this can be a key feature in the success of the procedure which involves a negotiated partnership to produce a detailed and valid set of qualitative data. As a practising quantity surveyor the author has an affinity with the research subjects and in-depth knowledge of the profession which should make it easier and offer a rapport between researcher and interviewee.

Haigh (2008) explores further the nature of interviewing and observes that interviews can never be a neutral form of data gathering and the relationship between the researcher and the participant remains fundamental to the process. However for a quantitative interview the researcher must remain as neutral and objective as possible recognising that the respondent is a 'research subject' and the researcher must not influence the outcome, remaining balanced and friendly but at the same time controlling and impersonal. A qualitative interview requires the relationship to be part of the process where the respondent is a 'participant' and not a 'subject'. The researcher has flexibility to change the structure of the interview and introduce new questions as appropriate. The procedure becomes a partnership to negotiate a detailed set of qualitative data. Grix (2010) refers to the human aspects of interviewing and suggests that the researchers consider their own

personality traits before embarking on a series of stressful encounters which may not produce the quality of data expected for the research.

The relationship that exists between the researcher and the participant is discussed by Kvale and Brinkmann (2009) who also discuss the dynamics that should ideally prevail for the interview. They suggest a collaborative approach where the researcher and the participant demonstrate a partnership in questioning, interpretation and recording the process. They raise other interesting factors that have been identified from their research including the researcher having to manage respondents who suppress their personal history or who are reluctant to discuss difficult aspects of their lives. This clearly identifies the challenges of qualitative interviewing that need to be overcome by the researcher.

Regarding the typology of qualitative interviews King (2008) refers to 'depth', 'exploratory', 'semi-structured' and 'un-structured' interviews. He uses the definition by Kvale (1983, cited in Creswell 2013) of a qualitative research interview as "*an interview, whose purpose is to gather descriptions of the life-world of the interviewee with respect to interpretation of the meaning of the described phenomena*". Therefore the object of a qualitative research interview is to understand the research topic from the perspective of the participant. King also refers to the relationship between the researcher and the respondent and how this relationship is part of the interview process. Like Creswell (2013), King (2008) explains how the qualitative research interviewer uses an interview guide which contains topics that are required to be covered during the interview process and further matters that could be addressed to prompt a more detailed response from the participant. King (2008) suggests that these additional matters may be sourced from the research literature or from the researcher's own knowledge and experience.

Bryman (2016) also agrees that the interview is probably the most popular technique employed for gathering data in qualitative research. The flexibility afforded by interviewing makes it most suitable for the researcher to adapt the procedure to the demands of time, logistics and personalities. Bryman (2016) states that despite numerous terms and labels, there are two main types of qualitative interview; namely unstructured and semi-structured. Bryman discusses these major types of interview and describes a semi-structured interview as a series of general questions loosely based on an interview guide where the interviewer has the flexibility to ask further questions regarding the replies more relevant to the research. An unstructured interview is where the researcher has a list of topics which are discussed informally and not necessarily in the same order for each interview.

Bryman (2016) also discusses how to conduct a qualitative interview and in referring to a semi-structured interview he also describes the interview guide as being a list of specific topics which the researcher would wish to cover in the process. The interview approach is flexible and allows the researcher to vary the order and probe particularly relevant responses from the participant. The interview guide is described as including a list of issues to be discussed and Bryman (2016) considers that it is critical that the questioning is designed to allow the respondent to impart their own particular perspectives on their social world. Creswell (2013) identifies nine points for the interview process and more specifically refers to the need for an interview protocol or interview guide which should include five to seven open-ended questions designed to encourage the participant to engage with the process. Creswell also suggests a pilot test for the interview to refine the questions into a final format. The challenges of qualitative interviewing are also recognised by Creswell (2013), he refers to the researcher coping with unexpected participant behaviour, dealing with sensitive issues and being able to phrase and negotiate constructive questions. He recognises that conducting an interview is a demanding event where encouraging the

participants to explain their experiences and the meaning of their particular insights into the phenomena requires skill and patience.

Qualitative research interviews are referred to by Cassell and Symon (2004) and they explain the importance of the relationship between the researcher and the respondent. They explain the generic objective of a qualitative research interview to be an exploration of the research topic from the experiences of the respondent and for the researcher to understand why a respondent has a particular perspective on the question. The interview is considered to have particular characteristics which include having a low degree of structure managed by the researcher; the use of open questions; and for it to be cognisant of particular situations and experiences from the realm of the respondent.

Regarding the type of questions, Bryman also relies upon Kvale (1996) and the nine different types of question for example; *introducing questions*: which obviously attempt to begin the story with the participant; *follow-up questions*: which encourage the participant to elaborate on an answer; *probing questions*: which directly ask the respondent to recap on what has been said previously; *specifying questions*: which require a response to a quite specific question regarding what and why; *direct questions*: which require a specific answer; *indirect questions*: a more open ended question; *structuring questions*: which control the process; *silence*: when applied allows respite from the procedure; *interpreting questions*: which require an explanation or clarification of what has previously been said by the participant. Bryman (2016) also reminds the researcher that one of the most important aspects of the interview is listening and not only being aware of what the participant is saying but also what the participant is not saying. The interviewer must also be cognisant of the respondent's body language which may indicate anxiety or other reactions to a particular topic of questioning.

The phrasing of questions for a qualitative interview is also considered by King (2008) who suggests that the manner of delivery has a major influence on how valuable the responses are for the research. He recommends avoiding multiple questions which could be confusing for the participant and only generate a partial answer. Leading questions should also be avoided as they tend to reflect the researcher's own opinions and the respondent may simply agree in wishing to please. An assumed answer to an assumed, obvious question could be the wrong answer and the researcher should not presume what would be a typical response for every participant. A misconception by the researcher may go unchallenged by the respondent and lead to false data.

The less structured nature of qualitative interviews is considered by Bryman (2016) compared with a survey interviews but he clearly differentiates between unstructured and semi-structured interviewing. The two types of interview are generally referred to as qualitative interviewing and are defined as follows: by having a greater interest in the respondent's opinion; often left to ramble in the interest of further insight into the participant's experiences; can move away from the interview guide and the order or structure of questions; generally tend to be more flexible and responsive to the participant's direction of travel with its replies. A semi-structured interview involves the researcher having a range of questions that are in the form of an interview guide but the researcher is able to adjust the sequence and latitude of the questions in search of data. Grix (2010) refers to a semi-structured interview as an in-depth interview which asks not more than ten questions but does not necessarily follow a particular sequence. The interviews are flexible in approach and are able to follow unexpected paths of enquiry. The generic objective of a qualitative research interview is explained to be an exploration of the research topic from the experiences of the respondent and for the researcher to understand why a respondent has a particular perspective on the question. The interview is considered to have particular characteristics which include having a low degree of structure managed by the researcher;

the use of open questions; and for it to be cognisant of particular situations and experiences from the realm of the respondent.

The author of this professional doctorate required an understanding and interpretation of the actions of professional practitioners in the reality of front-line situations and circumstances of a live construction project. In order to capture data that will provide answers to the research questions, it was necessary to obtain knowledge in the form of personal opinion and individual interpretation from practitioners in the field. As previously attested (Creswell 2013; Cassell and Symon 2004; Bryman 2016; Grix 2010), the data could only be gathered by asking questions in an appropriate form, as observation alone would not provide an insight into human reaction and thinking. The researcher is neutral when administering a survey questionnaire and so the interview questions needed to go further to obtain a subjective response from the participant. Semi-structured interviews have been chosen to compliment the questionnaire survey and support a subjective, constructionist, interpretivist philosophy. Based on a loosely structured interview guide the questions are designed to tease-out the practitioners' own impressions of professional education and professional practice. The participant's responses to interview questions will be explored more deeply where the author feels there is added-value for the research data. The author will attempt to generate a partnership with each of the respondents and develop a valuable reciprocation in the exchange of knowledge, experiences and meaning.

7.5. Mixed Methods

The rationale for applying a mixed methods approach to research which uses a combination of quantitative and qualitative data is recognised to be that potentially more meaning and knowledge can be generated about the research topic. The characteristics of each method are considered to compliment the strengths and weaknesses of the other. Mixed methods research adopts the paradigm of pragmatism in that it is focused on the outcome, in

answering the research question rather than the metaphysics of research philosophy, Punch (2014). A tangible separation between quantitative research and qualitative research is suggested by Crotty (1998) to take place not in philosophies but in considering the various methods of data collection, however he maintains that for any research project a combination of both quantitative and qualitative techniques can fulfil an aim and objectives.

Mixed methods are defined by Happ, Dabbs, Tate, Hricik, and Erlen (2006) as research design that applies both qualitative and quantitative data collection and analysis techniques together or sequentially. Creswell and Plano Clark (2011) refer, as an illustration, to narratives regarding global warming, weather phenomenon, political voting and sports commentaries which include both linear, statistical data and colourful, individual stories of personnel, combined to collect both numerical data and data involving words. They explain an explanatory sequential design whereby quantitative data is explained or elaborated by qualitative data to produce findings. Bryman (2016) states that mixed methods research incorporates quantitative and qualitative methods applied to a single project. Bryman also refers to an explanatory sequential design. Research by Long (2015) raises the important issue of validity and legitimation and how hard quantitative data can be used to validate softer, more subjective observations. Gray (2014) refers to how mixed methods provide a valuable contextual appreciation of the phenomenon being researched together with the identification of variables and an understanding of peoples' experiences in a particular context. This recent research literature demonstrates that combining different research methods can provide a more comprehensive data set than reliance on any one method alone and it is what this doctoral project does.

The author has chosen to investigate and evaluate professional education and its relationship with the professional practice of quantity surveying. It was considered as part of the research design that the research question should be answered by engaging directly with practitioners, to understand and explain their experiences. In this particular case a

broad cross section of the sample was necessary to make credible conclusions from the data gathered. The methodological choices available were appraised by the author as follows: an ethnographic approach would be too constrained as would case studies and action research. Whilst engaging with the work of others including Punch (2014); Bryman (2016); Long (2015); Gray (2014); Creswell and Plano Clark (2011); Happ et al (2006) and Crotty (1998), the author concluded that the methodology required a pluralist approach whereby hard quantitative data produced a core of responses that could be explained and enhanced by softer subjective qualitative results. This is recognised as an explanatory sequential design in which quantitative data is explained or elaborated by qualitative data to produce findings. At the same time the hard qualitative data validated the softer qualitative responses to interview questions. Therefore a mixed method approach is adopted to provide a combination of knowledge and meaning considered necessary to answer the research question.

The hypothesis for this research project therefore has been tested in one way by a self-administered survey questionnaire which was chosen to provide quantitative data for this social science project. The author required a means by which the competency levels of practitioners could be assessed and at the same time it was necessary to maintain a value-free data set. Practitioners will be asked to self-assess their considered competency level for a range of typical quantity surveying functions which aligned with RICS APC competencies. The author required substantiation for this hard, positivist approach to the research question together with an explanation and understanding of the participants' contributions. The hypotheses will therefore be tested by conducting semi-structured interviews which have been designed to explore the respondents' softer impressions of their experiences from professional education and professional practice. Gray (2014) suggests that a mixed methods approach generates data that characteristically has both breadth and depth. The mixed method approach for this research has been designed to provide a source of back-to-back data that supports the validation of conclusions drawn from the data set.

7.6. Sampling

Generic aspects of sampling are introduced here to support the author's chosen methodology in advancing answers to the research questions. All researchers are faced with having to decide how and where to obtain sufficient sources of data to answer the research questions posed by the subject to be investigated. The sample finally chosen must be able to provide enough data to enable meaningful analysis and conclusions to be drawn, Ahmed (2016). The sample size is a factor, a subset of the research population and identifying a population indicates the magnitude of all that is available to answer the research questions. However it is rarely practical to involve all members of the population therefore a representative sample of that entity must be established, Gill et al (2010). Quantitative research usually requires larger numbers of responses than qualitative studies and in each case reliability and validity are required to be balanced with the final sample size, Welman (2005). Sampling procedures necessary for qualitative research differ from strategies that are applicable to quantitative approaches and a mixed method research design raises further challenges to be overcome in selection of participants and the appropriate number of respondents, Creswell and Plano Clark (2011). As previously stated, the research sample selection should be informed by the overall research objectives and the methods used for sample selection should be sufficiently described within the research narrative together with an explanation of the methodological basis that justifies the research strategy. In some cases the researcher is faced with accepting whatever sample is conveniently accessible, notwithstanding complex formulas for the calculation of size, Punch (2014).

7.7. Sampling strategies

Creswell refers to a typology of sampling strategies compiled by Miles and Huberman (1994) cited in Creswell (2013) which identifies 16 sampling strategies and their respective purposes but whilst there is a degree of convenience used in the sampling strategy for this study, one main strategy prevails, namely purposive. Sampling strategies are explained by Bryman (2016) and his research identifies probability sampling particular to quantitative research

and the notion of purposive sampling which is more relevant to qualitative research. Purposive sampling is defined as a non-probability form of sampling which does not select participants on random basis. The researcher selects respondents strategically for their particular relevance to the research problem at the same time giving consideration to a variety of characteristics within the sample but retaining a bearing on the research topic. The characteristics of the constituents of a sample to be drawn from the research population; must be carefully considered to ensure that the sample reflects the characteristics of the population as a whole Naoum (1998).

Probability sampling, as stated by Bryman, assumes that every potential respondent has an equal relevance for selection, as in choosing one in every three of the sample entries. Non-probability sampling involves the researcher selecting participants who are known to have experience of the subject under consideration. The sample for this research was selected strategically by the author from those in practice most relevant to the research but at the same time ensuring that there was a good variety of participants. The unit of analysis for this research is the individual practitioner. The sampling approach adopted can be described as a mixture of *'typical case sampling'* and *'criterion sampling'*. This sampling strategy has been applied with reference to the research questions and the units of analysis are selected with characteristics that are able to address answers to the research questions. Creswell (2013) in his list of 16 strategies, refers to *'criterion sampling'* and it is suggested that it works well in situations where all the participants have experienced the phenomena in question. Both Bryman (2016 p.415) and Creswell (2013 p.158) also recognise snowball sampling which is described as a technique in which the researcher uses the first group of participants to establish connections with other potential subjects who have had experience relevant to the research, in effect developing a network.

The population for this research has been established from statistics published by the RICS. The institution claims to have 130,000 chartered members worldwide and 80,000 chartered

members in the UK, the demography of this UK total informs that 17,000 of those chartered members are quantity surveyors and further analysis confirms that 16,000 are currently actually practicing, Strong (2016). Therefore the population for this research is defined at a maximum figure of 16,000. In order to answer the research questions raised by this study the author required responses from 'chartered' quantity surveyors only. The research methodology tests the competency of chartered practitioners in practice situations and compares their performance against their education and training acquired through RICS programmes. The designation of "chartered" conveys on a practitioner a level of competency recognised by RICS to be that which is necessary to practice. This research compares practitioner performance at the prescribed level of competency set by RICS with a competency level that is observed by research literature and reflection in practice, to be necessary, in reality, for the demands of practice.

7.7.1. Participant selection

The author for this doctoral research project developed a sampling strategy that was purposive and at the same time snowball sampling. From a career that spans over 50 years in construction and includes a period of nearly 40 years practicing as a chartered quantity surveyor, the author has developed a considerable network of professional friends, colleagues, associates and client contacts. The network includes contacts made and relationships established from the following sources:

- Colleagues from professional practice employment;
- Colleagues from working for construction companies;
- Contacts and friends from the cohort of academic courses attended;
- Contacts in academia from attending various courses;
- Contacts and friends from this doctoral cohort at Salford;
- Contacts from being an Accredited RICS APC Assessor for over 20 years;

Contacts from being a registered CIOB examination marker;

Contacts from being a registered trainer and mentor for RICS APC Apprenticeship candidates;

Contacts from being a member of the RICS Governing Council for four years;

Contacts and friends from being a member of the local RICS QS and Construction Committee in Manchester for over ten years;

Contacts from clients served during 20 years spent as a sole practitioner.

The author will establish an initial contact with members of this network either by a face-to-face meeting or a telephone conversation. The strategy is designed to generate a sample of participants who would be suitable and willing to take part in both quantitative and qualitative data gathering procedures. Each meeting or telephone conversation will be followed by an email confirming the nature of the research project, the project aim and objectives; together with an explanation of the proposed research methodology and ethical considerations and relevant data protection information management.

Follow-up emails will include a link to the online survey questionnaire and contacts will be asked to circulate the link to practitioner colleagues who they felt matched the selection criteria stated in the email. The selection criteria confirmed in the email stipulated that participants should be “chartered” quantity surveyors currently working as a front-line practitioner on live projects in the UK built environment. The final question of the survey questionnaire will ask if the respondent would be willing to participate in a semi-structured interview lasting approximately one hour.

7.7.2. Selection criteria

As previously stated in Section 7.7.2, respondents chosen for the sample are required to be “chartered” quantity surveyors working in a front-line capacity on live projects in the UK built environment market. Current live project experience is an important aspect of the respondent’s curriculum vitae as it complies with the study focusing on the construction phase of projects.

7.7.3. Sample size

The size of a research sample to be taken from the research population is explained in many different ways by scholars and researchers. References to the work of others are included here in support of the final sample size used for this research. The sample for this research was not premeditated, anticipated or calculated by the author during the research design phase of this project but the final sample of units that responded with data is broadly in line with recognised research conventions. Burnmeister and Aitken (2012) define sample size as the smallest number of respondents necessary to identify a variance, if a variance exists. The degree of homogeneity of the participants to a sample influences the minimum number of responses necessary to reflect the study population which means that if the participants are similar then the sample relative to the population can be smaller.

External validity is referred to by Thompson (1999) as the extent to which the findings of a particular research methodology can be taken to represent the population beyond the sample used in the research. He also refers to *sampling error* which reflects the degree of representativeness of a sample for a population as any sample can never fully represent a population. Regarding qualitative research Thompson considers that a representative sample is not so important and that the sample selection should be cognisant of the participant’s characteristics and relevance to the hypothesis being studied, a random sample would not provide a homogeneous sample base.

Sample sizes for qualitative research are believed by Malterud, Dirk Siersma, and Dorrit Guassora (2016) to be ascertained as in quantitative studies but not in the same way. They propose that the more data held by a sample relevant to the research question, the less number of participants are needed, they propose the concept of “information power”. They also refer to data “saturation” where the contribution that data makes to a research problem is inversely proportional to the size of the sample, which means as the sample size increases the contribution and value of the data decreases. Bryman (2016) reflects that as a teacher of research he is most often asked about sample size and he has concluded that there is no overarching, all embracing answer. Creswell and Plano Clark (2011) suggest that the qualitative researcher identifies a small number of participants who will contribute rich, in-depth data. Qualitative research does not generalise as in a probabilistic sample where data is gathered randomly from the sample. The belief for qualitative research is that the larger the sample, the less rich data can be obtained from any one respondent. Creswell (2013) continues with this theme and proposes that the object of qualitative research is to gather a considerable amount of rich, in-depth data from a relatively few individuals. For example, Creswell recommends a sample of 20 to 30 participants will produce sufficient saturation for a qualitative study.

Sample size relative to a probability sample for quantitative research is considered by Welman (2005) who suggests that researchers should not proceed with a sample less than 15 units of analysis and ideally the sample should be greater than 25. Gill (2010) also explores sample size for a random sample raising the issue of a complex population that is stratified into differing categories and sub-parts. Here the absolute size of the sample is influenced by the complexity of the population. As previously explained in Section 7.7.2., this doctoral research will adopt a purposive sampling strategy developed randomly through snowballing. The author purposively selected the core group of contacts known to have experience of the issues being investigated. The email or telephone conversation with each contact will ask for their cooperation with the research and at the same time ask them to

circulate details of the research project to other potential respondents having stipulated the selection criteria they should apply in approaching others. The snowball aspect of the sampling strategy for this research therefore contains an element of random probability that may include participants who have not been selected by the author and not personally known to the author.

The characteristics of a sample for it to be a truly representative of the population for survey a research project is stated by Hinton, McMurray, and Brownlow (2014) to include the following data:

Gender;

Age;

Employer;

Job title;

Degree.

Hinton suggest that this demonstrates a pragmatic approach which for this research also involves convenience sampling, opportunity sampling, purposive and snowball sampling.

7.8. Data

Data for most empirical social research is comprised of quantitative data or qualitative data or a combination of these two main types. Quantitative data is in the form of numbers or quantities and qualitative data is not necessarily numbers and more often in the form of words, accounts, explanations, linguistics, Punch (2014). The author for this doctoral research has adopted a mixed method approach which relies on the characteristics of each methodology complimenting and supporting the other. Both methods involve more than

just data gathering, both involve a particular way of thinking and a particular approach in answering research questions.

7.8.1. Quantitative data

Quantitative data for this research project will be gathered using a self-administered online survey questionnaire where the respondents remained anonymous within the data set. The questionnaire is designed to ascertain the competency level of practitioners and their experiences of professional education and training including Continuing Professional Development (CPD) and mentoring. Competency levels will be tested from responses to a ranked Likert scale which asks the respondent to self-assess their considered level of competence for a range of quantity surveying functions that mirror RICS APC competencies.

The self-administered survey questionnaire commences with a header page that sets out the purpose of the research and its objectives; a risk assessment statement; the option to withdraw at any time; consent; confidentiality and the policy for data management. (See appendix 1)

The survey questionnaire contains four sections as follows:

Section 1 – Questions related to your personal details – comprising interval/ratio, nominal/categorical and dichotomous variables:

1. How old are you?
2. What gender are you?
3. What is the discipline of your degree?
4. Which year did you graduate?
5. Which year did you become a chartered member of RICS?
6. Which type of organisation is your current employer?
7. What is your job title?

Section 2 – Professional Competencies – comprising ordinal variables:

1. Personal and interpersonal skills?
2. Leadership and general management?
3. Professional practice?
4. Computer literacy and IT?
5. Construction technology theory
6. Measurement?
7. Commercial management?
8. Economics of construction?
9. Procurement and financial management?
10. Advanced financial management?
11. Construction contract practice?
12. Construction law administration?
13. Dispute resolution?
14. Project management?

Section 3 – Continuing professional development and mentoring – comprising interval/ratio, nominal/categorical, dichotomous and ordinal variables:

1. How many hours of CPD do you complete each year?
2. Does your employer provide time for your CPD activities?
3. Does your employer provide financial support for your CPD activities?
4. Does your employer provide in-house training for CPD activities?
5. What CPD topics do you usually pursue?
6. Does your employer facilitate a workplace mentoring scheme?
7. How significant do you consider mentoring to be for your professional development and competencies?
8. Considering the amount of mentoring currently available to you, would your professional development and competencies benefit from any of the following?

Section 4 – Further involvement in this research – comprising a dichotomous variable:

1. Would you be prepared to take part in a semi-structured interview lasting approximately 1 hour?

As stated previously in Section 6.5, for this study, the author will assess the competency levels of practitioners in a value-free way. Practitioners will therefore be asked to self-assess their level of competency for a range of typical quantity surveying functions using a ranked Likert scale.

7.8.2. Self-assessment

Scholars have consistently been interested in understanding the construct of self-assessment and what part it can play, for example, in the appraisals individuals make of their own self-worth, capabilities and competence. Existing research literature covers a range of aspects from studies of the subject including: self-ratings for management appraisals; personality traits; self-assessment for clinical competence; error detection methods in self-assessment; self-assessment or self-deception; reliability and validity of self-assessment and self-assessment practices. The following section reviews current thinking using the research literature of others to support the author's methodological choice of self-assessment as a means to obtain value-free data.

Chang, Lance-Ferris, Johnson, Rosen, and Tan (2012) refer to Core Self-Evaluation (CSE) and identify four traits of CSE:

- *self-esteem*-an appraisal of self-worth;
- *generalised self-efficacy*-the ability to perform in a wide range of situations;
- *emotional stability*-to naturally feel calm and secure;
- *locus of control*-the belief that our own behaviour effects desired results rather than fate or others.

Chang et al (2012) conclude that CSE has made considerable impact on organisational research which indicates that there exists confidence in the data that it produces.

Inderrieden, Allen, and Keaveny (2004) consistently found that individual subject involvement in the appraisal part of performance assessment was increasingly important and that self-rating was more appropriate in business and commerce than evaluation conducted by managers. Dunkel, van der Linden, Brown, and Mathes (2016) refer to the General Factor of Personality (GFP) and the issue of socially-desirable responding in self-assessment procedures which could influence the perceived reliability of data and indicate bias in the results. Dunkel et al. (2016) recommend including response bias measures and regression analysis to support other analytical methods that defend reliability.

Self-assessment by nursing professionals was studied by Wangenstein et al. (2018) and they concluded that the results indicated areas where there was a need for further skills training. They recommend that the application of Cronbach's alpha value formula should be used to validate or otherwise the survey instrument. Baxter and Norman (2011) also studied nursing students and concluded that self-assessment can only be successful if the participant has no knowledge gaps, a statement which tends to defeat the object of the procedure. Wheeler, McDonough, and Hagemann (2017) believe that self-assessment is an important skill in developing competent professionals and fundamental in the development of CPD. The research by others referenced here confirms that the support for self-assessment has grown within academia and the professions however the author is cognisant of its obvious weaknesses but for this research it is expected to indicate valuable trends and tendencies in data that are discussed in Chapters 8 and 9 of the thesis.

7.8.3. Qualitative data

Qualitative data for this research project will be collected using semi-structured interviews. The interviews are designed to explore practitioners own experience and interpretation of their professional education and the realities of professional practice. The interviews are expected to last approximately one hour. Each member of the sample who agrees to participate in an interview will be provided with an Interview Guide (See Appendix 2) prior to the interview taking place. The Interview Guide establishes a structure for the interview

and prepares the respondent for the type of questions to be posed. The guide includes a header page of guidance notes which set out the purpose of the research project and its objectives; the nature of expected responses; a risk assessment statement; consent; the option to withdraw at any time and the assurance of anonymity and confidentiality.

The guide is comprised of three sections as follows:

Section 1 – Introduction

General details of time, date, method, reference number and general introduction including confirmation of the respondent's agreement to proceed.

Section 2 – Subject areas and draft questions

Work experience

1. What is the nature of your employer organisation?
2. What is your job title?
3. What is your role and what are your responsibilities?
4. What type of projects do you manage?
5. What is the value range of these projects?

Professional education and professional practice

1. To what extent did the knowledge you obtained from your degree level education prepare you for the RICS professional quantity surveying pathway?
2. Please explain how relevant RICS professional education and training for quantity surveyors has been for you in dealing with the demands of practice?
3. What aspects of professional practice do you find most challenging and why?
4. Have you had experience of dealing with conflict and dispute during the construction phase of projects in your area of practice, if so, how have you administered these issues?
5. Please explain how important senior colleagues have been in helping you to acquire professional knowledge and expertise?

6. How important to you is professional life-long learning and continuing professional development?
7. How would you rank the importance of high standards of professional ethics and conduct in the current built environment market?
8. Do you think that RICS professional education and training for quantity surveyors could be improved, if so, how?

Section 3 – Closing comments

1. Final comments from the interviewee
2. Final comments from the interviewer
3. Thanks to the participant

7.9. Data analysis

Data is data, it does not analyse itself, Smith (2009) believes the data analysis phase of a research project brings the work to life for the author. It is during this stage that it becomes evident what the research has achieved and what conclusions can be drawn from the findings. Decisions are required regarding how to make sense of the information and knowledge gathered by the research methodology. Dierckx de Casterle, Gastmans, Bryon, and Denier (2012) in furtherance of their research, state that data analysis particularly for qualitative research is complex and challenging. They believe that it has not been sufficiently addressed by research literature. Maxwell (2013) suggests that the analysis of qualitative research data is shrouded in mystery which seems to be in agreement with Dierckx de Casterle et al (2012). Data analysis is introduced by Bryman (2016) as the stage in a research project where statistical techniques are applied to the results of a data gathering methodology. Creswell and Plano Clark (2011) in promoting a mixed method approach to research, state that data analysis for mixed methods involves analysing each method separately followed by techniques that combine the two analysis in establishing the response to research questions. Creswell (2013) observes that data analysis simply involves

organising, collating and scheduling data in preparation for the application of further analysis techniques.

These generalised statements from a selection of research literature concerning data analysis are introduced here as prelim for more specific explanations that are included in Section 6.19.1. The author for this doctoral research project has chosen a digital approach for the data analysis methodology which means that the quantitative data is to be gathered, stored and analysed using the Statistical Package for Social Sciences (SPSS). This software is particular to statistical analysis providing a range of tests for variables and tendencies together with statistical checks and balances for variance and validity. SPSS also offers a range of charts and presentation graphics including pie charts, histograms and box plots. The qualitative data will be processed using Computer Assisted Qualitative Data Analysis Software (CAQDAS) and in particular NVivo which digitally converts text into raw data that can be analysed and tested for themes, relationships and patterns. There follows an explanation of how data gathered for this research was developed using SPSS and NVivo ultimately to provide a collection of findings to be discussed in Chapter 7 that will contribute to the author's subsequent conclusions. The explanation that follows also demonstrates the author's awareness of these digital research aids and supports the logic for this chosen methodology.

7.9.1. Quantitative data analysis

The online survey questionnaire will be designed using Bristol Online Surveys (BOS) software. The survey will be made available to respondents by an email which will contain an internet link to the survey document. Completion of the survey and activating the "FINISH" button will save the results to BOS for collection and storage. BOS software provides a link to input the data to a range of statistical software packages including SPSS which will be used for this research to perform whatever analysis the author considered appropriate to assist in answering research questions. BOS software also enables a choice of questions that produce different types of data. Questions involving nominal data where the

variable is a name or title; questions that produced ordinal data where the data is a rank order or in this case a position on a Likert scale; questions that produced interval and ratio data which in this case involved identifying a year or date from a drop-down menu. The answers to each type of question involve multiple choice options selected by a “button”.

Questions included for each category of data are as follows:

Nominal

- Gender
- Degree
- Employer
- Job title
- CPD topics

Ordinal

- 14 quantity surveying functions – each on a 5 point Likert scale
- Significance of mentoring – 4 point ranked scale
- Amount of mentoring – 4 point ranked scale

Interval/ratio

- Age
- Year of graduation
- Year of RICS membership
- CPD hours

Dichotomous (Yes or No)

- Employer CPD time
- Employer CPD financial support
- Employer in-house training
- Employer work-place mentoring

- Willingness to be interviewed

Quantitative data from the survey questionnaire sample will be analysed as follows:

Nominal

Percentage distribution male and female – graphic and table

Percentage distribution degree discipline – graphic and table

Percentage distribution employer – graphic and table

Percentage distribution job title – graphic and table

Percentage distribution CPD topics – graphic and table

Ordinal

Calculate the Mean (μ) and the Standard Deviation (σ) and Frequency Distribution for each of the 14 quantity surveying functions – graphic and table

Calculate the Mean (μ) and the Standard Deviation (σ) and Frequency Distribution for the significance of mentoring - graphic and table

Calculate the Mean (μ) and the Standard Deviation (σ) and Frequency Distribution for the amount of mentoring - graphic and table

Interval/Ratio

Percentage distribution for age – graphic and table

Percentage distribution for year of graduation – graphic and table

Percentage distribution for year of RICS membership – graphic and table

Percentage distribution for CPD hours – graphic and table

Dichotomous (Yes or No)

Percentage distribution for each – graphic and table

Further Quantitative Data Analysis

All 14 quantity surveying competencies will be analysed against:

Age

Degree

Employer

Job title

Work-place mentoring

The Mean (μ) and the Standard Deviation (σ) of each of the 14 quantity surveying competencies will be compared with the corresponding practice-based issues from a summary of issues identified in the Literature Review. The Mean (μ) and the Standard Deviation (σ) of all the 14 quantity surveying functions will be reviewed to identify trends and patterns for the whole competency data set.

7.9.2. Qualitative data analysis

Qualitative data for this research project will be gathered using a series of semi-structured interviews. The interviews will be conducted face-to-face, by Skype or by speaker phone. Each interview will be recorded using a digital voice recorder and a precise word-for-word transcription will be made of each recording. Each participant will receive a copy of the transcription of their interview and asked to confirm whether, in their opinion, it was a true representation of the discourse or whether they required amendments to the script. The author will not proceed with analysis until approval for the transcription is received from the respondent. Transcriptions will be stored electronically in an encrypted computer file with access restricted to the author only. Each transcription will be read and re-read online

to develop an understanding of what was discussed with each respondent, ascertain a broad feel for the nature of their responses and how further analysis could be progressed. The transcripts will be copied to NVivo Version 11 software as a database to facilitate further appraisal and to develop other analytical procedures including 'coding', the development of 'nodes' and 'themes'.

7.9.3. Computer Assisted Qualitative Data Analysis Software (CAQDAS)

NVivo software is one of many computer packages that support the analysis of qualitative research data generically referred to as CAQDAS. A review of CAQDAS is included here to demonstrate the author's understanding of this digital research aid and to justify adopting this particular research technique. The review identifies strengths and weaknesses of CAQDAS and the corresponding issues that face researchers who use the technology. CAQDAS is available in various packages and King (2008) recognises that the software is being used increasingly for its capacity to store, organise and manage the abstraction and analysis of large amounts of data. However, the use of this technology does not necessarily result in robust, structured, systematic research.

CAQDAS has been considered to be separate to the analytical process of research and could result in analytic distance for an uninformed user. Without closeness to the data there appears to be an unconscious tendency to over-code which leads to confusion and a lack of credibility. However, faced with the option to use traditional methods of fracture and analytic reassembly, the current qualitative researcher would be disadvantaged by not utilising CAQDAS. Manual methods for example; frequency counts of words or collections of words, hard copy coding which includes transcribing interviews and theme building are all time consuming and unstable, producing untidy and complicated results. King identifies that CAQDAS allows the researcher to test hunches with data that would normally be prohibitive by time and resource if conducted manually. Without any preference or critique King lists a range of software available as follows:

- ATLAS;
- HyperRESEARCH;
- InfoRapid;
- Kwalitan;
- MAXQDA 2007;
- QDA;
- QSR Nvivo;
- QUALRUS;
- Storyspace;
- TRANSANA.

Detailed information for each of these products is available from the individual software producer and the CAQDAS Networking Project. Regarding methodological considerations and computer aided data analysis, King reminds the researcher that a computer can only help in the process of analysis but it cannot analyse the data. Generically the software will store, search and assist analysis but it is the researcher that analyses data not the computer. In terms of the overall research design for the study, the software should not be allowed to influence methodological approaches which should be informed by the research aim and objectives. Ontological, epistemological, methodological and methods should influence the research design and not the traits of a computer software package.

King also refers to analytic distance and over-coding, both alleged to be caused by the use of computer software. On the one hand interview transcripts stored online without any manual input could distance the researcher from an intimate awareness of the content of each; and that unfamiliarity with data could lead to over-coding and a loss of perspective, distortion of themes and thematic analysis. These are all factors for which the researcher should have cognisance and King, whilst recognising the benefits of CAQDAS, recommends that the researcher, through methodological literature, should maintain an informed

approach to the software thus preventing its elevation to a methodology rather than a research method.

Qualitative computer programmes are confirmed by Creswell (2013) to have been in existence since the late 1980s. He describes the process of qualitative data analysis using a computer as the same for the stages of analysis carried out manually; the researcher reviews the data base, designs the codes, codes text segments, collates the same codes into themes; and develops a printout of the text segments or themes. As stated by King and Smith (2009) computer programmes store data, provide easy access, collate the coded data but it always remains for the researcher to design and allocate coding and identify themes and categories. The advantages and disadvantages of CAQDAS are addressed by Creswell (2013) and can be briefly summarised as follows: a computer programme enables the organised storage of data that is easily accessed by the researcher; text stored electronically can be closely examined for a deeper understanding of the meaning of responses rather than casually reading through text files; a computer programme will facilitate concept mapping which provides a visual interpretation of relationships between codes and themes; data are easily accessed and retrieved from electronic files.

The disadvantages of using computer software include: having the necessary skills to effectively run and manage the software; the researcher may become distant from the data 'data distance' as discussed by King and Smith (2009), moving material around and changes in categories or themes may be difficult with some software packages; lack of meaningful instruction as to how to use the programme is sometimes constraining for the researcher; the traits of software can vary which requires the researcher to spend time 'shopping around' in order to select that which is appropriate for its particular research.

Bryman (2016) devotes a complete chapter to CAQDAS and in particular the application of NVivo. He states that the use of CAQDAS replaces clerical tasks such as manual coding and retrieving data. He believes that of all the software packages available, there is not a particular product that could be labelled as 'top of the league'; and NVivo is considered to be a widely used example of CAQDAS without any particular preference. The better known programmes like NVivo offer variations on a code and retrieve facility which allows the researcher to code text directly into the computer and later retrieve the text abstracted against each code. This means that the software can search through the corpus of data and collate for each code all the segments of text that have been labelled for that code. However, as clearly stated by King and Creswell, the researcher must design and allocate the codes and interpret the data, software cannot assist with decisions about the coding of text or matters regarding the interpretation of data.

Statistical Package for Social Sciences (SPSS) software used in quantitative research is recognised as the industry leader but there is no comparator in qualitative research but NVivo is considered as one of the better known packages available. Bryman (2016) recognises that there are some concerns about the use of CAQDAS and unlike quantitative data analysis where the use of software is widely accepted, there is not the same level of enthusiasm for CAQDAS amongst qualitative researchers. Some of the concerns are briefly explained as follows : coded text can be quantified using SPSS and this may attract the same measures of validity and reliability for qualitative research as for quantitative research; the code and retrieve techniques commonly applied to qualitative data analysis may fracture the textual material to such an extent that the narrative flow of interview transcripts and dialogue recorded in the field may be lost; an awareness of context may be lost by the fragmentation of text followed by grouping fragments and some consider this will result in decontextualizing the data; a coding and retrieval function can be obtained through word processing software such as Microsoft Word. Bryman points out that some of

these observations were made before 2000 and the application of software has obviously developed further since then.

It is suggested by Silverman (2006 cited in Smith 2009) in analysing data from qualitative interviews, that the respondent's opinion is not necessarily an explanation of the phenomena being studied. Silverman suggests that interview data are set in a particular time, place and dialogue which could mean that they make claims rather than truly represent things as they really are that is they are constructivist. Qualitative researchers face a challenging aspect of completing their thesis in the process of analysing data. Creswell (2013) describes the process as organising the data, reading and becoming familiar with the data, coding and identifying themes, reporting the themes and interpreting the analysis to a conclusion. Explained more specifically, Creswell states that data analysis in qualitative research involves reducing interview data into transcripts, coding the discourse and abstracting the coded transcripts into themes, describing and reporting the themes and representing the data in tables for further discussion and conclusion.

Creswell believes that this is the generic approach that researchers apply to qualitative research. Regarding interpretation of qualitative research data, Creswell (2013) states qualitative research requires identifying the larger meaning of data through abstraction beyond codes and themes. Interpretation can be based on the researcher's instinct, a hunch, insight or intuition and these stimuli can then connect with the research literature of others to provide credibility and stature. Andrew, Salamonson, and Halcomb (2008) state that computers enable data processing, management and analysis but they are not an alternative to critical analysis by the researcher.

7.9.4. Analysis of the Interview Transcripts

As part of the software data processing NVivo will store the interview transcripts as a data base for online access and further analysis. Anonymity and confidentiality for the

participants are important ethical aspects of the research design and methodology. Each individual transcript will be identified only by the serial number for the digital recording. However, whilst this facility will protect individual identities for the participants, the software will also store, anonymously under “classifications”, a range of participant characteristics and attributes which will include:

Employer organisation;

Job title;

Role and responsibilities;

Type of project experience;

Project values;

Gender

NVivo will be used to run cross comparisons of all these classifications with topics and themes identified from the discourse analysis of interview transcripts. The cross comparison analysis may reveal further relationships between factors of topics from what is called ‘nodes’ in NVivo; which will contribute to the findings presented in Chapter 7. The author will be able to read and reread interview transcripts online to develop closeness with the data and provide a preliminary feel for opinions and explanations expressed by the participants. The transcripts will be coded into ‘nodes’ which will each have a subject or title and can then expanded into themes and concepts. Questions from the interviews will provide responses from participants to the following aspects of quantity surveying education and practice briefly summarised again here for clarity with particular reference to the data analysis process:

Degree level education relative to RICS pathway competencies;

RICS education and training relative to practice;

Challenging aspects of professional practice;

Experience of conflict and dispute;

Importance of senior colleagues for professional development and expertise;

Impressions of life-long learning and CPD;

Importance of high standards of professional ethics and professional conduct;

Could RICS professional education and training for quantity surveyors be improved?

7.10. Summary of the Chapter

This chapter has set out the drivers for the research project. The research philosophy, the research hypothesis and the methodology and research techniques adopted to answer research questions. The author's world view of quantity surveying practice and the corresponding professional education has posed a number of issues considered worthy of investigation and a potential source of new knowledge. The author's reflection in practice as a practitioner scholar and professional credentials obtained from over 50 years of practice and life-long learning have contributed to this particular world view. The chapter explains how the author has designed the project to engage with current research literature and seek contributions from chartered quantity surveyors practicing in the current UK built environment market. The research is designed to create a view of current quantity surveying practice and its relationship with policies and procedures of professional education promoted by RICS. Chapters that follow present the analysis of empirical results obtained from the adopted research techniques leading to a chapter of discussion regarding observations surrounding the results.

8. RESULTS AND DATA ANALYSIS

8.1. Introduction

This chapter of the thesis contains a review of the results from data collection techniques adopted by the author to develop the research argument and answer the research questions. Research findings are presented and the results of data analysis techniques applied to the raw data are displayed. The chapter begins with a section that contains a brief review of the chosen research techniques and philosophies that support these choices. This is followed by a section that explains more specifically how the sample size was developed from the sampling strategy described within Chapter 7 Section 7.7. Results from the quantitative self-administered online survey questionnaire are presented within Section 8.4 and this is followed by Section 8.5 which explains the qualitative research transcripts from the semi-structured interviews. Results of coding and theme development are presented in Section 8.7.4 which completes the appraisal of research findings and results. The chapter is not used to discuss the results or draw any conclusions from the research findings it simply presents, at this stage, the results of the chosen data collection techniques and analysis.

8.2. A review of chosen research techniques and the supporting philosophy

This section of the chapter briefly revisits the chosen research techniques and how they are justified by generally accepted philosophical conventions. The research project investigates the relevance of RICS professional education and training for quantity surveyors by identifying the nature of practice-based issues encountered in the current built environment market. The circumstances of these issues are compared with the personal impressions and experiences of chartered quantity surveying practitioners. The study places its argument in the author's particular world view of quantity surveying practice in the current UK built environment market. The ontology of this perception of social reality is the experience and belief that chartered quantity surveying practitioners demonstrated levels of competency

that are sensitive when faced with current issues of practice. The philosophical position adopted to investigate this problem relies on the ontological paradigm of interpretivism which identifies, in this case, reality to be social actors (quantity surveying practitioners) explaining a meaning for their actions through qualitative research methods. In addition quantitative data gathered for this research demonstrates characteristics that can be defined by the paradigms of both objectivism and subjectivism together with constructionism where true meaning is derived from engagement with reality. Conceived from the realities of practice, the research has been designed to evaluate current professional education for quantity surveyors and make a contribution new knowledge and improve quantity surveying practice standards. The research makes a contribution in two registers, 1 academic, 2 new knowledge of professional education and the practical and societal impact of current mandated policies. Therefore a greater understanding of the realities of professional education and training for chartered quantity surveyors.

One of the objectives of this research is to obtain data that assessed the competency levels of practitioners in fundamental quantity surveying functions that mirror RICS APC competencies. Self-assessment by the practitioners themselves was adopted to assess competency levels and the author believes that this has produced data that is both valid and credible. The empirical data, findings and analysed results from this study have been obtained using a mixed methods approach which was adopted to further the research argument and provide answers to the research questions. The rationale for adopting a pluralistic approach to data gathering methods was, in part, the ability to triangulate and mutually corroborate the research findings from each method. Mixing methods of data collection enable the strengths of one method to support the weaknesses of the other. The UK RICS quantity surveying active membership is confirmed to be 16,000, Strong (2016) as such it has not been possible to canvass the entire practising population. The author, however, sought to demonstrate a comprehensive account of RICS education and training

for quantity surveyors by adopting both quantitative and qualitative methods of data collection to fulfil this objective.

Adopted research techniques produced a mutually compensating set of raw data. The quantitative approach provided clear structured data to answer the research questions and the qualitative research provided subjective impressions of the processes of professional education and practice. The use of two research techniques facilitated a way in which one method provided an explanation for the other and for this research project, the qualitative data generated softer insights into the harder quantitative findings. Sampling for the study benefitted from the mixed method approach by drafting the online survey questionnaire that included a question to identify respondents who agreed to participate in the qualitative interviews. The author also believes that a dual approach to the research methods gave the research findings a greater integrity and provided completeness for research into this particular field of enquiry and depth compatible with the investigation of the practitioners' perspective.

This research project questions the relevance of RICS education and training for quantity surveyors facing issues of practice that occur in the current UK built environment market. The author has previously attested to over twenty years' experience as an accredited RICS APC Assessor and in that time the structure of the APC process and the competencies assessed at interview have changed very little, RICS (2006); RICS (2018b). Whilst remaining a loyal supporter of RICS and an enthusiastic ambassador for the quantity surveying profession, the author wished to demonstrate how the needs of practice have changed. The empirical data gathered for this research has been derived from practitioners themselves and these sources have produced a valid data set as the basis for conclusions drawn in the final stages of this thesis. The author sought to generate new knowledge that could be used to benefit the profession and improve existing practice standards.

8.3. Sample size for the self-administered online survey and semi-structured interviews

As previously explained within Section 7.7.3 of Chapter 7 the participant selection/sampling strategy adopted by the author was purposive and snowballing. The strategy involved a network of the author's professional contacts who were asked, not only if they were prepared to participate in the research, but also, whether they would be willing to approach other suitable respondents known to them personally. The sampling strategy ultimately generated 89 responses to the self-administered online questionnaire, 12 of whom were female. A total number of 22 practitioners agreed to participate in a semi-structured interview, 3 of whom were female. 12 of these participants indicated their willingness to be interviewed by positively answering the final question of the survey questionnaire. The gender split for both the survey and the interview sample reflects RICS membership demography which confirms that it includes 12% female members RICS (2019).

8.4. Quantitative Data

Quantitative data for this research project has been gathered using a self-administered online survey questionnaire. The survey asked participants to self-assess their experiences from practice and their levels of competency for a range of quantity surveying functions that match RICS APC Competencies. The survey was designed to highlight quantity surveying functions that practitioners themselves found most demanding and where they felt their levels of competency were sensitive. Data from the survey was imported directly into SPSS (Version 24) where it was stored and processed. Descriptive frequency analysis and cross tabulation was then used to display the attributes of the sample and subsequently relationships between the scoring from self-assessment. Results are presented in various attention point forms including tables, charts and graphics. Presentations from the results of each survey question are accompanied by narrative that explains the outcome of the analysis. This section of the chapter summarises the quantitative contribution to the research findings.

8.4.1. Survey - Section 1

Section 1 of the questionnaire contained questions that explored the attributes and characteristics of the respondents and the results are presented here in the tables that follow:

How old are you?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 - 25	3	3.4	3.4	3.4
	26 - 30	11	12.4	12.4	15.7
	31 - 35	19	21.3	21.3	37.1
	36 - 40	14	15.7	15.7	52.8
	41 - 45	12	13.5	13.5	66.3
	46 - 50	13	14.6	14.6	80.9
	51 - 55	7	7.9	7.9	88.8
	56 - 60	7	7.9	7.9	96.6
	61 - 65	2	2.2	2.2	98.9
	over 65	1	1.1	1.1	100.0
	Total		89	100.0	100.0

Table 8.1. Question 1 How old are you?

The analysis from Question 1 of the survey shows that the majority of respondents were from an age range between 26 years and maximum 50 years and within that age band the results show a prominent frequency exists between the ages of 26 years and maximum 35 years.

What gender are you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	76	85.4	86.4	86.4
	Female	12	13.5	13.6	100.0
	Total	88	98.9	100.0	
Missing	System	1	1.1		
Total		89	100.0		

Table 8.2. Question 2 What gender are you?

The analysis of responses to Question 2 of the survey confirms that the respondents' attributes displayed an 85% / 14% male / female gender split which, as previously stated, is broadly in line with RICS membership demographics. The proportionality of the sample justifies its relevance.

What is the discipline of your degree?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Quantity Surveying	58	65.2	66.7	66.7
	Quantity Surveying and Construction	15	16.9	17.2	83.9
	Construction Management	2	2.2	2.3	86.2
	Law	1	1.1	1.1	87.4
	ONC, HNC or an equivalent professional body qualification	6	6.7	6.9	94.3

	Other, please specify	5	5.6	5.7	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

Table 8.3. Question 3 What is the discipline of your degree?

This table from the responses to Question 3 of the survey confirmed that 84% of the respondents have obtained a quantity surveying related degree which confirms the nature of their basic propositional professional education.

Which year did you graduate?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1980	1	1.1	1.2	1.2
	1982	1	1.1	1.2	2.3
	1983	3	3.4	3.5	5.8
	1984	1	1.1	1.2	7.0
	1986	4	4.5	4.7	11.6
	1987	1	1.1	1.2	12.8
	1988	1	1.1	1.2	14.0
	1990	1	1.1	1.2	15.1
	1991	3	3.4	3.5	18.6
	1992	2	2.2	2.3	20.9
	1993	1	1.1	1.2	22.1
	1994	6	6.7	7.0	29.1

1995	4	4.5	4.7	33.7
1996	2	2.2	2.3	36.0
1997	1	1.1	1.2	37.2
1998	1	1.1	1.2	38.4
1999	4	4.5	4.7	43.0
2001	1	1.1	1.2	44.2
2002	4	4.5	4.7	48.8
2003	5	5.6	5.8	54.7
2004	3	3.4	3.5	58.1
2005	1	1.1	1.2	59.3
2006	4	4.5	4.7	64.0
2007	1	1.1	1.2	65.1
2008	2	2.2	2.3	67.4
2009	4	4.5	4.7	72.1
2010	6	6.7	7.0	79.1
2011	4	4.5	4.7	83.7
2012	4	4.5	4.7	88.4
2013	3	3.4	3.5	91.9
2014	5	5.6	5.8	97.7
2015	1	1.1	1.2	98.8
2017	1	1.1	1.2	100.0
Total	86	96.6	100.0	
Missing System	3	3.4		

Total	89	100.0		
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Table 8.4. Question 4 Which year did you graduate?

Question 4 of the survey was designed to establish the extent to which the respondents' propositional level professional education was current. The SPSS table shows that over 25% of the participants graduated within the last 10 years.

Which year did you become a chartered member of RICS?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1985	1	1.1	1.1	1.1
	1987	3	3.4	3.4	4.6
	1988	3	3.4	3.4	8.0
	1990	1	1.1	1.1	9.2
	1991	3	3.4	3.4	12.6
	1993	1	1.1	1.1	13.8
	1994	1	1.1	1.1	14.9
	1995	2	2.2	2.3	17.2
	1996	2	2.2	2.3	19.5
	1997	1	1.1	1.1	20.7
	1998	1	1.1	1.1	21.8
	1999	3	3.4	3.4	25.3
	2000	2	2.2	2.3	27.6
	2001	1	1.1	1.1	28.7
	2002	2	2.2	2.3	31.0

2003	3	3.4	3.4	34.5
2005	4	4.5	4.6	39.1
2006	1	1.1	1.1	40.2
2007	4	4.5	4.6	44.8
2008	3	3.4	3.4	48.3
2009	2	2.2	2.3	50.6
2010	1	1.1	1.1	51.7
2011	7	7.9	8.0	59.8
2012	3	3.4	3.4	63.2
2013	2	2.2	2.3	65.5
2014	8	9.0	9.2	74.7
2015	5	5.6	5.7	80.5
2016	4	4.5	4.6	85.1
2017	7	7.9	8.0	93.1
2018	6	6.7	6.9	100.0
Total	87	97.8	100.0	
Missing System	2	2.2		
Total	89	100.0		

Table 8.5. Question 5 Which year did you become a chartered member of RICS?

Similarly Question 5 of the survey was designed to establish the extent to which the respondents' chartered qualification was current. The SPSS table confirms that 40% of the respondents became chartered within the last 7 years.

Which type of organisation is your current employer?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Private Practice	10	11.2	11.4	11.4
	Consultancy	32	36.0	36.4	47.7
	Contractor	34	38.2	38.6	86.4
	Public Sector	2	2.2	2.3	88.6
	Specialist Subcontractor	1	1.1	1.1	89.8
	Sole Practitioner	3	3.4	3.4	93.2
	Local Authority	1	1.1	1.1	94.3
	Government	2	2.2	2.3	96.6
	Other, please specify	3	3.4	3.4	100.0
	Total	88	98.9	100.0	
Missing	System	1	1.1		
Total		89	100.0		

Table 8.6. Question 6 Which type of organisation is your current employer?

Question 6 of the survey was designed to establish under what market circumstances the respondents professional practice experience was obtained. The SPSS table confirms that 86% of participants worked in private practice, quantity surveying consultancies or contracting organisations. The largest proportion of the sample (34%) worked for contracting organisations.

What is your job title?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Quantity Surveyor	15	16.9	18.1	18.1
	Senior Surveyor	11	12.4	13.3	31.3
	Managing Surveyor	5	5.6	6.0	37.3
	Consultant	2	2.2	2.4	39.8
	Commercial Manager	9	10.1	10.8	50.6
	Director/Partner	24	27.0	28.9	79.5
	Other, please specify	17	19.1	20.5	100.0
	Total	83	93.3	100.0	
Missing	System	6	6.7		
Total		89	100.0		

Table 8.7. Question 7 What is your job title?

Question 7 of the survey was designed to demonstrate the level and source of the respondents' practice experience. The SPSS table shows that over 50% of the respondents were practising as quantity surveyors but a further 27% stated that they fulfilled a Director/Partner role which could indicate a detachment from current front-line practice experience. However issues of practice are required to be addressed at any level within business entities in the built environment.

In summary, Section 1 of the survey explored the respondents' attributes as demonstrated by SPSS charts. The attributes explained the demography of the sample and the findings are summarised as follows. 34% of the respondents were aged between 26 and 35 years. From the sample total of 89, 76 were male and 12 were female. 84% of the sample had completed a degree in quantity surveying and 25% had graduated within the last 10 years. 40% of the respondents had become chartered members of RICS within the last 7 years. 86% were employed by either private practice, quantity surveying consultancies or contracting organisations, the largest employing sector (34%) were contracting organisations. Other employers included the public sector, specialist subcontractors and sole practitioners. Job titles revealed that over 50% of the respondents were clearly front-line practitioners others appeared to be in more senior roles but were none the less confronted by practice-based issues. These statistics demonstrate that the survey sample was representative of the practice population to the extent that the author was satisfied that the research was placed with a valid range of practitioners.

8.4.2. Survey - Section 2

The main thrust of the 30 questions that comprised the questionnaire were 14 questions in Section 2 which asked the respondents to self-assess their level of competence for quantity surveying functions that mirrored RICS APC competencies. The professional skills that respondents were asked to assess are set out as follows:

Question 8 – Personal and Interpersonal Skills

Question 9 – Leadership and general management

Question 10 – Professional practice

Question 11 – Computer literacy and IT

Question 12 – Construction technology theory

Question 13 – Measurement

Question 14 – Commercial management

Question 15 – Economics of construction

Question 16 – Procurement and financial management

Question 17 – Advanced financial management

Question 18 – Construction contract practice

Question 19 – Construction law administration

Question 20 – Dispute resolution

Question 21 – Project management

Results from the SPSS analysis are condensed into the following chart:

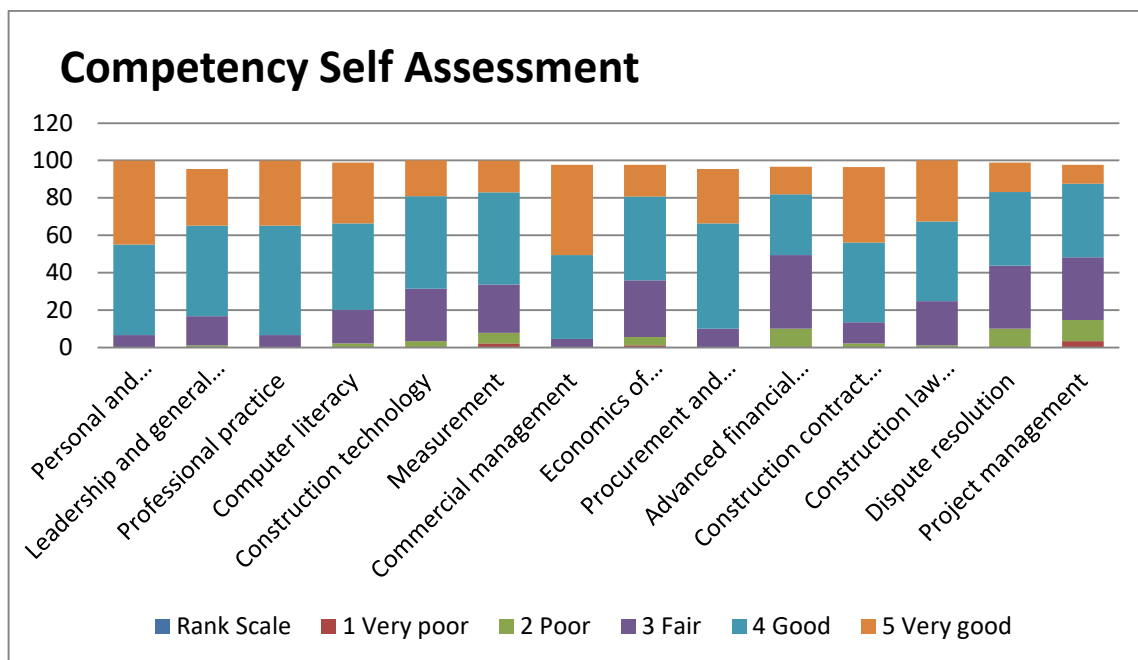


Chart 8.1. Competency self-assessment

The colour coding indicates ranking and the column of numbers on the left hand side of the chart are a scale of percentages. For the purposes of this research the author considers that competencies which have attracted a score of 'Fair' (Purple) and less from between 50 and 20 percent of responses demonstrates an area of practice that is weak. In that regard the chart illustrates quantity surveying functions that are sensitive to lower levels of professional competency. The following table displays the sensitive quantity surveying competencies ranked in descending order by the percentage scores of 'Fair' and less. The table identifies practice functions that practitioners' themselves feel are areas subject to lower levels of competency.

Competency	Score % Fair and less
Advanced financial management	49
Project management	48
Dispute resolution	44
Economics of construction	36
Measurement and costing of construction works	34
Construction technology theory	32
Construction law administration	25
Computer literacy	20

Table 8.8. Competencies scored at 'Fair' and less

The largest age groups from the online survey data are shown to be between the ages of 26 to 30 and 31 to 35, a total number of 30 respondents. From the author's experience from over 20 years of RICS APC interviewing, this age range represents the majority of newly qualified chartered quantity surveyors. It also represents from the cohort those

practitioners most likely to be involved in front-line practice during the construction phase of projects in the UK built environment. Responses from this age group indicate problem areas of front-line practice. Whilst this sample represents 30 respondents from a total of 89 the author considers this result to be significant and indicative of a trend.

Statistics

How old are you?

N	Valid	89
	Missing	0
Mean		4.60
Median		4.00
Mode		3
Std. Deviation		2.087

Using the SPSS cross tabulation function, the following table collates scores from these age groups at 'Fair' and less for the quantity surveying competencies identified as sensitive to lower levels of competency:

Competency	Score 'Fair' and less	% of total
Project management	19 from 30	63
Advanced financial management	18 from 30	60
Dispute resolution	15 from 30	50
Economics of construction	14 from 30	47
Construction technology theory	12 from 30	40
Measurement and costing of construction works	10 from 30	33
Construction law administration	10 from 30	33
Computer literacy	4 from 30	13

Table 8.9. Scores from respondents between the ages of 26 and 35. In total 30

This table shows the practice competencies that young practitioners feel are weak in their arsenal of skills that they themselves have available to address practice-based issues. All of these competencies are fundamental to the problems of practice and the administration of issues of practice for projects in the UK built environment.

8.4.3. Survey - Section 3

Section 3 of the questionnaire explored aspects of Continuing Professional Development and Mentoring and the results of the remaining 8 questions of the survey are also presented from SPSS in the following charts and tables:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 - 9 hours	1	1.1	1.1	1.1
	10 - 19 hours	1	1.1	1.1	2.2
	20 - 29 hours	40	44.9	44.9	47.2
	30 - 49 hours	31	34.8	34.8	82.0
	50 - 100 hours	13	14.6	14.6	96.6
	Over 100 hours	3	3.4	3.4	100.0
	Total		89	100.0	100.0

Table 8.10. How many hours of CPD do you complete each year?

The RICS mandatory requirement for members is 20 hours of Continuing Professional Development (CPD) per year, 10 hours of which are required to be formal meaning that the CPD topic involves a clear learning outcome relevant to practice functions. The SPSS analysis shows that 82% of the respondents recorded between 20 and 49 hours of CPD. The survey question did not distinguish between formal and informal CPD.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	73	82.0	83.0	83.0
	No	15	16.9	17.0	100.0
	Total	88	98.9	100.0	
Missing	System	1	1.1		
Total		89	100.0		

Table 8.11. Does your employer provide time for your CPD activities?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	51	57.3	58.6	58.6
	No	36	40.4	41.4	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

Table 8.12. Does your employer provide financial support for your CPD activities?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	69	77.5	79.3	79.3
	No	18	20.2	20.7	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

Table 8.13. Does your employer provide in-house training for CPD activities?

The previous three questions of the survey were designed to gage the extent of employer support experienced by respondents. The SPSS analysis shows that 82% received time for CPD, 57% received financial support for CPD and 78% benefited from in-house training organised by their employer.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Contract Law	34	38.2	38.2	38.2
	Dispute Resolution	9	10.1	10.1	48.3
	Contract Administration	21	23.6	23.6	71.9
	Professional Practice and Ethics	8	9.0	9.0	80.9
	Measurement	3	3.4	3.4	84.3
	Other, please specify	14	15.7	15.7	100.0
	Total	89	100.0	100.0	

Table 8.14. What CPD topics do you usually pursue?

This survey question was designed to establish areas of practice where practitioners felt that they required support for their existing levels of knowledge and competence. The SPSS analysis shows that over 60% of respondents felt that Contract Law and Contract Administration were areas of practice where they required additional support and expertise.

The final three questions of the survey relate to mentoring and the acquisition of professional practice knowledge from senior colleagues through a structured facility implemented by their employing organisations.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	53	59.6	61.6	61.6
	No	33	37.1	38.4	100.0
	Total	86	96.6	100.0	
Missing	System	3	3.4		
Total		89	100.0		

Table 8.15 Does your employer facilitate a workplace mentoring scheme?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very significant	33	37.1	37.5	37.5
	Significant	33	37.1	37.5	75.0
	Fairly significant	9	10.1	10.2	85.2
	Not significant	13	14.6	14.8	100.0
	Total	88	98.9	100.0	
Missing	System	1	1.1		

Total	89	100.0		
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Table 8.16. How significant do you consider mentoring to be for your professional development and competencies?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A much greater level of structured mentoring	17	19.1	19.5	19.5
	More mentoring	29	32.6	33.3	52.9
	About the same level of mentoring	40	44.9	46.0	98.9
	Less mentoring	1	1.1	1.1	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

Table 8.17. Considering the amount of mentoring currently available to you, would your professional development and competencies benefit from any of the following?

The SPSS analysis revealed that 60% of respondents benefited from a workplace mentoring scheme. 75% of respondents felt that mentoring made a significant contribution to their professional development and 53% felt that their professional development and competence would benefit from a greater level of mentoring.

In summary, Section 3 of the survey addressed Continuing Professional Development (CPD) and Mentoring. CPD was well supported by practitioners and the majority of employers provided time, finance and in-house training. The most favoured CPD topics were Contract Law and Contract Administration. Over 50% of respondents benefitted from in-house mentoring facilitated by their employers and 30% felt that they would benefit from more mentoring.

8.5. Survey – Reflection on the process

Procedures for the quantitative part of this research proved to be unpredictable once the online survey questionnaire had been designed and established in the chosen online survey software. However the survey generated a valuable response rate and the returns were generally fully complete. The author's network of contacts proved to be very supportive of the project. Once the survey was launched the level of response could only be influenced in limited ways of cajoling and influencing. The number of completed returns was encouraging and the author considered that they were representative of the population. Attributes of age, gender, education, employer and job title demonstrated an appropriate range of contributors (see Tables 8.1 to 8.6). The survey was designed to approach the research argument by allowing respondents to self-assess their competency levels for practice functions. Whilst self-assessment could be criticised for not providing honest, valid answers, research literature referenced in Chapter 3 Section 3.18.2 contains much that supports this technique. Results from the online survey clearly indicated an overall trend. The extent to which practitioners honestly scored their levels of competency did not disguise this obvious trend. The survey has made a valuable contribution to this research project and the results will be discussed in Chapter 9 that follows.

8.6. Survey – Summary of the analysed findings

An overall review of the quantitative data gathered from the online survey confirmed findings particularly relevant for this research project. The respondent age range was predominantly 26 to 35 years. The gender split was in line with RICS membership data. The majority completed a quantity surveying degree and graduated within the last 10 years. 40% of the respondents became chartered within the last 7 years. The respondents' employer demographic confirmed a representative spread across public sector (4) private practice/quantity surveying consultancy (42) and contracting companies (34). Their job titles indicated that practicing front-line practitioners were in the majority. The author considers that these attributes indicate that research sample was representative of the population and demonstrates that the research focus has been able to include younger, newly qualified practitioners working on the front-line of practice issues in the current UK built environment. The self-assessment part of the survey produced data that revealed practitioners considered themselves weak in 8 key areas of competency including advanced financial management, dispute resolution, measurement of construction works, construction technology and construction law administration. These eight key areas of competency were tested specifically against scores entered by the 26 to 35 age range and results confirmed that maximum 64% of that sample felt they were weak in these eight competencies.

8.7. Qualitative Data

This section of the chapter presents qualitative data as part of a mixed method approach to investigating the efficacy of professional education and training for chartered quantity surveyors from the practitioners' perspective. Qualitative data for this research project have been collected using a series of semi-structured interviews with practising chartered quantity surveyors. The structure of the interview was designed to explore the practitioners' experience of RICS professional education and training together with issues of practice encountered during the construction phase of projects in the built environment. This

research project argues the relevance of RICS professional education and training for quantity surveyors and personal observations and experiences described by practitioners' themselves during the course of an interview produced valuable data that has been used to test the research hypothesis. The results of this qualitative aspect of the study have been presented using schedules, tables and charts together with verbatim quotes from interview participants. The presentations are supported by narrative that explains the results of this qualitative aspect of the research.

The qualitative procedures employed for this part of the study involved methods that gave the resultant data credibility and validation. Each interview was digitally recorded and an accurate transcript made into a Microsoft Word document as a rich text file. The participants received a copy of the transcript as a matter of record and a means by which the author obtained approval from the participant that the transcript was a true record of the interview. The transcripts were then imported into NVivo Version 11 and stored, from where they were read by the author online to facilitate a greater understanding of the content and a feel for the nature of experiences described by the participants. Simply reading and rereading the transcripts formed the basis for coding the responses into Nodes and developing Themes from the data. The adopted procedures for collection and analysis of the qualitative data benefitted from the application of computer software described within Chapter 3 Section 3.19.3, in keeping with similar technology used to process quantitative data.

8.7.1. Interviews

The 22 interviews took place over a 3 month period and the gender of the participant, method of interview, recording number, date and duration of each interview are set out in the following table:

No.	Gender	Method	Recording No.	Data	Duration
1	Female	speaker phone	180831-001	31-Aug-18	49 mins
2	Male	speaker phone	180905-002	05-Sep-18	39 mins
3	Male	speaker phone	180906-001	06-Sep-18	50 mins
4	Male	speaker phone	180906-002	06-Sep-18	44 mins
5	Male	skype	180905-001	05-Sep-18	32 mins
6	Male	face-to-face	180913-001	13-Sep-18	26 mins
7	Male	face-to-face	180913-002	13-Sep-18	45 mins
8	Male	face-to-face	180914-001	14-Sep-18	50 mins
9	Male	speaker phone	180914-002	14-Sep-18	48 mins
10	Male	speaker phone	180917-001	17-Sep-18	28 mins
11	Female	face-to-face	180919-001	19-Sep-18	39 mins
12	Male	face-to-face	180920-001	20-Sep-18	35 mins
13	Male	face-to-face	180921-001	21-Sep-18	48 mins
14	Male	speaker phone	180925-001	25-Sep-18	30 mins
15	Male	speaker phone	180926-001	26-Sep-18	32 mins
16	Male	speaker phone	180927-001	27-Sep-18	40 mins
17	Male	speaker phone	180928-001	28-Sep-18	61 mins
18	Male	speaker phone	180928-002	28-Sep-18	49 mins
19	Male	speaker phone	180928-003	28-Sep-18	40 mins
20	Male	speaker phone	180928-004	28-Sep-18	49 mins
21	Female	speaker phone	181007-001	07-Oct-18	64 mins
22	Male	speaker phone	181010-001	10-Oct-18	59 mins

Table 8.18. Interview Schedule

8.7.2. Interviews – Section 1 Introduction

The interview commenced with a brief introduction which involved the author reiterating the guidance notes on page 1 of the interview guide with the interviewee before commencing the procedure.

8.7.3. Interviews - Section 2 Work experience

The interview transcripts were analysed using a function of NVivo which facilitates the generation of codes from the text. The codes were collected into Nodes and the following tables represent the Nodes that indicate the range of participants’ attributes recorded in the interviews. The variance displayed here serves to demonstrate the spread of practice experience that has contributed to data:

Employer	Frequency
Crown Commercial Service HM Government	1
Multi-disciplinary practice, QS, Building Surveying and Dispute	1
Consultant Quantity Surveyors	3
Contractor, Developer	1
Chartered Quantity Surveyors Project Manager SME	1
Multi-disciplinary claims consultancy	1
Chartered Quantity Surveyors SME	1
Facilities Management Company	1
Construction , Property Maintenance and Civils	1
Landlord Development Company	1
Building Contractor	2

Residential Development Company	1
Chartered Quantity Surveyors, Project Manager, Building Surveyors	1
Engineering Consultancy	1
Property company, developer, contractor, consultancy	1
Global multi-disciplinary consultancy	1
Chartered Quantity Surveyor, sole trader SME	1
Local Authority, London Borough	1
Construction Management Company	1

Table 8.19. Employing Organisations

This table displays employing organisations stated by the participants in their interviews, summarised as follows:

Public Sector: 2

Quantity surveying practices: 8

Quantity surveying consultancies: 3

Contractors/developers: 9

The range of practice employment set out in the table above confirmed that the sample was representative of the built environment professional and commercial entities including public bodies, quantity surveying practices, consultancies and building contractors/developers. It was necessary for the author to demonstrate that the sources of practice experience used as data for the study represented a credible sample of the profession and the construction industry. The relevance of RICS education and training for quantity surveyors needed to be tested across a valid range of the built environment

organisations to enable the study to make a meaningful contribution to existing knowledge in the field.

Participants' stated Job Title	Frequency
Head of Account Management	1
Senior Consultant	1
Director of Operations	1
Commercial Director	1
Chartered Quantity Surveyor	2
Executive Director	1
Associate Director	1
Special Projects Director	1
Commercial Manager	3
Head of Project Consultancy	1
Chartered Quantity Surveyor Director	2
Senior Development Manager	1
Cost Consultancy Director Chartered Quantity Surveyor	1
Senior Chartered Quantity Surveyor	1
Managing Chartered Quantity Surveyor	1
Chartered Quantity Surveyor Director Cost Management	1
Head of Corporate Capital Projects	1
Production Manager Management Contracting	1

Table 8.20. Job Titles

This table displays the job titles stated by participants during their interviews, summarised as follows:

Client-side quantity surveyors and quantity surveying consultants: 12

Contractor/developer quantity surveyors, commercial managers and directors: 10

The participants' job title conveys the level of seniority and practice experience that has contributed to the scenarios discussed during the interviews. The table above displays the full range of employment positions that the participants themselves stated during the interviews. The author was particularly keen to explore the experiences of practitioners currently working on live projects at any level. The impressions of experiences described by these front-line practitioners served as a measure of how effective and relevant their RICS professional education has been in providing the knowledge and experience necessary to manage practice-based issues in the current built environment. The success of a construction project is sensitive to the competency levels demonstrated by construction professionals during the construction phase of project completion. The author's hypothesis suggests that practitioners have not been sufficiently equipped to properly manage issues encountered during this critical phase of a project time-line.

Participants' stated role and responsibilities	Frequency
Client-side quantity surveying including pre and post contract responsibilities	8
Contractor/developer quantity surveying including commercial management	7
Consultant quantity surveying, commercial support and dispute support	5
Public sector quantity surveying including pre and post contract responsibilities	2

Table 8.21. Roles and responsibilities

This table summarises the role and responsibilities stated by participants' during their interview. The results display a balance of data sources that are spread across areas of practice typically found in the current built environment. The analysis demonstrates that research material has been obtained from a credible range of practice responsibilities.

8.7.4. Interviews – Section 2 Professional education and professional practice

Following sections of the interview structure that addressed the participants' attributes, subsequent questions focused on their experiences and impressions of professional education and practice. This part of the interview was designed to explore a more subjective aspect of the participants' recollections. These questions were facilitated by the author interceding with his own personal experiences of practice only to the extent that encouraged more from the interviewee. The following analysis of the transcripts represents the findings revealed from the 22 interviews. The author wished to maintain, as far as possible, value free responses from the participants and whilst the working assumptions for the research is partly situated in the author's own professional experiences and perceptions, the validity of conclusions set out in Chapters 6 and 7 of this thesis needed to be founded in the research data. Coding of interview transcripts described within Section 7.8.3 followed the semi-structured nature of the interviews and the extent to which the interview discourse followed the intended structure varied. The interviewer at times became engrossed in a particular topic or scenario and at other times found it necessary to compensate for the interviewees' limited responses. Despite all the interviews being different the semi-structure created Themes or Concepts within the transcripts. Themes were coded into Nodes indicated by the following bold text and within each theme Node, Child Nodes were coded into sub-themes, indicated by bullet points.

Experiences of an RICS Accredited Degree course

- Measurement 4/5
- Good Degree 9/11
- ONC, HNC 5/5

- Poor Degree 14/23

Experiences and impressions of RICS Professional Education

- Good 11/11
- Soft Skills 2/2
- Dumbing Down 1/1
- Gap Between Academia and Practice 2/2
- Poor 3/4

Aspects of Practice that are found to be most challenging

- Measurement Skills 3/3
- The Process 7/7
- Ethical Issues 2/2
- Disputes 2/2
- People Skills 8/8

Experiences and impressions of dealing with Conflict and Dispute

- Negotiation 11/11
- Contract Conditions 6/6
- Quantification 3/3
- Contemporaneous Records 2/2

The value of Mentoring in developing professional competence

- Very Important 17/17
- Gender Problems 2/3
- Limited Influence 6/7
- Younger Staff 11/16

The value of Life Long Learning CPD in maintaining professional competence

- Very Important 19/20
- Must be Increased 10/13

The importance Professional Ethics in professional practice

- RICS Standards 18/26
- Very Important 16/17
- Carillion 6/6
- Improvements 14/14

Perceived improvements to RICS Professional Education

- Technology 5/5
- Measurement 7/10
- Soft Skills 6/8
- Sign-off 4/5
- Practical Training 6/8
- Dispute and Law 3/4
- Post Chartered 4/5
- Higher Professional Standards 13/28

Other relevant comments regarding RICS professional education and practice

- RICS Seminar Costs 3/3
- Detachment from Membership 2/2
- Professionalism 5/9
- Practical Training 3/3
- Measurement and Technology 5/6
- RICS 8/17
- Universities and Practice 8/9
- Soft Skills 2/4

The sub-themes coded into Child Nodes indicated topics that were raised by participants in connection with more than one of the main themes and the weighting given to each Child Nodes by number of respondents/number of comments. For example the notation of 8/9

indicates that eight interviewees made a total of nine comments against that particular Child Node.

The following topics were evident in more than one Theme or Node:

- Need for measurement skills 4/5, 3/3, 7/10, 5/6, 3/3
- Need for technology skills 5/5. 5/6
- Need for soft skills, people skills, negotiation 2/2, 8/8, 11/11, 6/8, 2/4
- Need for knowledge of Disputes and Law 2/2, 3/4, 6/6
- Need for more practical training 2/2, 6/8, 3/3, 8/9
- Need for higher professional standards and professionalism 13/28, 5/9, 2/2

Other prominent issues discussed included:

- Poor accredited degree 14/23
- Need for higher ethical standards 2/2, 18/26, 16/17, 14/14

The value of mentoring was considered:

- Very important 17/17, 11/16

Life Long Learning CPD revealed the following opinion:

- Very important 19/20
- Must be improved 10/13

Theme	Raised by	Total number of comments per theme
Need for higher ethical standards and professionalism	22	59
Need for soft skills, people skills, negotiating skills	22	33
Mentoring is very important and must be facilitated	22	33
Life-long learning CPD RICS mandatory level must be raised	22	33
Need for greater measurement skills	22	27

Need for higher professional standards	20	39
Need for more practical training	19	22
Poor RICS accredited degree	14	23
Need for greater knowledge of construction law	11	12
Need for greater technology skills	10	11

Table 8.22. Principle themes raised in 22 Interviews

This table displays an abstract of the principle themes raised by participants in the interviews; the themes have been compiled from the schedules included above. In the left hand column of numbers the table confirms the number of participants who referred to each theme. The right hand column records the number of comments made in support of each theme and this number establishes a ranked weighting for the extent of importance the sample has attached to each of the principle issues. The table has only condensed principle issues identified from the interview transcripts however a number of other issues were revealed during the interviews. Collectively these other issues add weight to themes surrounding experiences and impressions of RICS education and training together with issues of practice confronted by practitioners. The Discussion chapter of the thesis brings together all of the salient points made during the interviews but the principle themes are tabled here to reinforce the extent and depth of research findings.

The themes and sub-themes set out above are supported by the following verbatim quotations selected from the interviews which are representative of perceptions expressed by practitioners.

Verbatim Interview quotations in support of discourse sub-themes	
Principle sub-themes	Representative quotations
Need for measurement skills	<p><i>"...lacking is around measurement. It's the technical expertise</i></p> <p><i>"...understanding the method of measurement..."</i></p> <p><i>"...measurement is severely underrated"</i></p>
Need for technical skills	<p><i>"...core skills...go back to technology..."</i></p> <p><i>"...lack of understanding about what construction is..."</i></p> <p><i>"...technological process...actually quite challenging..."</i></p>
Need for people skills, negotiating	<p><i>"soft skills are important"</i></p> <p><i>"...managing people..."</i></p> <p><i>"...actually do negotiating skills..."</i></p> <p><i>"...without communication and negotiating skills you're not going to go anywhere"</i></p>
Knowledge of disputes and law	<p><i>"...just understanding where the risk lies"</i></p> <p><i>"...dispute resolution"</i></p> <p><i>"...settlement of final accounts"</i></p> <p><i>"...a bruising encounter"</i></p>
More practical training	<p><i>"I think it could definitely be trained"</i></p> <p><i>"...significant emphasis of real-world practice..."</i></p> <p><i>"...knowing the way things should be done"</i></p>

Chart 8.2. Verbatim interview quotations

8.7.5. Interviews – Section 3 Closing comments

Section 3 concluded the interview giving the interviewee an opportunity to comment on any other aspects of their work experience and professional education and training that they felt

relevant to theme of the interview. The procedure was finally closed by the author thanking the interviewee and confirming that a transcript of the discussion would be provided for their approval.

8.8. Interviews – Reflection on the process

The experience of interviewing was challenging both logistically and methodologically. The participants comprised professional colleagues, casual acquaintances and total strangers. The initial intention was to employ Skype to overcome logistical problems but the technology proved to be unreliable and the author came to prefer face-to-face or speaker phone encounters. Face-to-face meetings were most rewarding and the quality of data benefitted from personal contact with the participant. The interviewer was able to gauge the demeanour of the interviewee and make any adjustments necessary to the tone of the meeting. Speaker phone encounters tended to be more rambling and wordy without any visual means of control and interjections were harder to make without deterring the interviewee. The recording device functioned well and provided reliable records from which accurate transcriptions were made. Contributions from Irish practitioners were sometimes difficult to accurately transcribe and a practitioner from Sri Lanka also created similar problems in understanding accents. The transcriptions were made professionally by a specialist company and not by the author but any technical misunderstandings could be rectified at draft stage. Arranging and undertaking the interviews involved an intensive period of managing both the procedure and means but which the data was processed and stored.

The interviews were enthusiastically approached by practitioners who were keen to discuss their work, issues of practice and RICS policies. The author looked upon the encounters as a negotiated partnership to generate knowledge for the greater good, a synergy that would make a valuable contribution to standards of practice and the profession. The exchange of

ideas, beliefs and experiences were mutually appreciated and were a means by which the interviewer could stimulate the discussion. As responses to questions developed some participants were surprised by the concepts and issues that were revealed. Some topics discussed revealed thoughts and opinions regarding quantity surveying practice that had not occurred to the interviewee and the author found this aspect of the process most rewarding. The questioning structure of the interview generated strong opinions, beliefs and impressions from the participants and the opportunity to openly discuss matters of practice was eagerly embraced. A bottom up approach in the research design generated detailed, fine-grain data and is an appropriate method to adopt in answering the research question.

8.9. Interviews – Summary of the analysed findings

The analysis of data gathered from 22 interviews with chartered quantity surveying practitioners set out above are summarised in the following themes. Participants considered their RICS accredited degree level education to be of a poor standard. They strongly felt the need for greater measurement skills, for a greater knowledge of construction technology and more knowledge and expertise regarding the management of conflict, dispute resolution and construction law. Soft skills, people skills, relationship skills and a need to understand and develop negotiation skills were high on the agenda for greater professional knowledge and competency. The participants identified a gap between degree level propositional education and practical on the job training and practical training should have a much greater role to play. The majority wished to raise professional standards and levels of professionalism for chartered quantity surveyors. They also felt that ethical standards in the profession should be raised including probity, altruism, level of service, trust, respect, taking responsibility and acting with transparency. Participants mostly agreed that mentoring is very important for professional development and that CPD was also very important to the extent that the current RICS mandatory requirement for CPD should be increased.

8.10. Summary of the Chapter

Empirical data generated through quantitative and qualitative research techniques adopted by the author have been collected and presented in this chapter. These research methods have been chosen to further the author's argument and answer the research questions. Results of data analysis have been presented in tables and charts which are supported by text that is a summary of what is visually displayed. The supporting narrative does not discuss the results at this stage nor does it draw conclusions from the findings. Chapter 9 that follows will bring together results of the mixed method approach and combines the findings of each with the theoretical constructs raised by others in current research literature within Chapters 2, 3, 4, and 5.

9. DISCUSSION

9.1. Introduction

Chapter 6 explained philosophical perspectives, research hypothesis and the conceptual frameworks that have informed the design for this study. In the discussion that follows, these theoretical aspects of the research argument are brought together with the findings and results obtained from empirical research techniques. Research methodology adopted for this project has generated and referenced data from four resource strands:

Current literature

Current case law

Empirical dataset

RICS policy documentation

The discussion chapter provides an overview of all that has gone before and makes a connection between research theory and the reality of empirical data. Sections 9.2 and 3 of this chapter review the research argument and rationale for the study which is followed by a review of the methodological approaches that have been driven by the research question. Discussions that follow revisit current theory in the field, current case law and the empirical dataset. The chapter closes by integrating current theories with the analysis of research findings and a compare and contrast of all the theory and empirical research data with current RICS policies. The purpose of this chapter is to distil the research output into a narrative that informs the original aim and objectives of the project. The chapter contains brief references taken from the earlier parts of this thesis which are used to reinforce a review of the research output.

9.2. Rationale and research argument

This research has been motivated by a rationale that is cognisant of conflict and dispute in construction and the research argument opines a cause and effect explanation for the increasing occurrence of these issues. Rationale for the project lies in the consequences of

conflict and dispute on construction projects in the UK built environment. Problems of conflict and dispute emanating from the construction process are on the increase and create uncertainty and risk for all project stakeholders as confirmed by Allen (2013); Kitt (2018); Rogers (2019). Current research literature makes a connection between issues of conflict and dispute and practice-based issues for quantity surveyors and Love et al (2009); Allen (2013); Genton (2014); Ansell and McCafferty (2017) and NBS (2018) clearly identify these issues of practice. Late completion attracts a financial burden for the client and penalties for the contractor. Specification and scope changes generate cost and potentially disagreement of the valuation of that change, late payment and dispute. Unfulfilled contractual obligations often result in disruption and an entitlement to damages for breach of contract. Poor contract documentation causes confusion and misunderstanding.

It is suggested that these scenarios involve the expertise of professional chartered quantity surveyors who are employed to manage and administer the process. This research argues that there is an inversely proportional relationship between the outcome of these circumstances and the level of professional competence demonstrated by chartered quantity surveying practitioners. The author suggests that there is a link between levels of professional competence and professional education and training and the empirical research data confirms that aspects of practice where practitioners consider themselves to be weaker are those areas that current research literature associates with the causes of conflict and dispute. The extent to which RICS education and training for quantity surveyors has relevance for issues of practice encountered in the current built environment market is the main thrust of the research project. A review here of the research rationale and argument prepares the ground for further discussion regarding the research outcomes.

9.3. Philosophical perspectives, research hypothesis and conceptual framework

Reflection on the author's experiences of practice has generated this research project and the following brief review of the research thinking serves to reiterate an explanation for the origins of this study. The philosophical perspectives of this research are driven by the author's experience of a skills gap in the reality of quantity surveying practice. Reflection from a long career as a quantity surveying practitioner and a perceived skills gap lead to the basis for a professional doctorate investigation. Concepts that contribute to the framework of this study include current theory in the field, assumptions made about the field and the author's reflection in practice. All of these concepts in some way reflect on practice-based issues that occur in quantity surveying. The author has experienced at first hand the consequences from practice-based issues on construction projects in the UK built environment and the ontology of these issues have generated a desire to investigate and understand the nature of these problems. New knowledge for the benefit of quantity surveying education and practice has been the result of these philosophies and the investigation of these concepts.

9.4. The professions and the social contract

RICS is a prominent professional body with jurisdiction throughout the UK built environment market. As a professional body it has, by definition, accepted obligations and responsibilities. Amongst those obligations is the continuing responsibility to provide for the teaching of specialist knowledge that is current and relevant, Cruess et al. (2000). RICS defines itself as the professional body that governs the advanced learning, education and training for quantity surveyors RICS (2018b). The extent of commitment to these undertakings could therefore be assessed against the performance of its quantity surveying practitioner members. RICS, as a professional body, has a responsibility to the wider public and its members to provide knowledge and expertise to the extent that practitioner members are competent to practise Stehr (2009). The implied social contract that a profession has with society, exchanges professional competence and integrity for trust,

status and autonomy of governance, as recognised by Susskind and Susskind (2015) Susskind and Susskind (2015). An undertaking that requires only appropriately qualified individuals be admitted to membership.

Other research suggests that there is a growing loss of public faith in the professions where the side effects of solutions for issues of national importance have simply added to the problem being addressed, as identified by Schön (1983); Mitchell (2002); Muzio et al. (2011); Susskind and Susskind (2015) and Plender (2018). More recently these suggestions from research have been confirmed by circumstances surrounding the crises of Carillion, Grenfell Tower, Crossrail and HS2, raising awareness of what happens in the everyday. In considering these obligations and responsibilities including matters of trust and status against current perceptions of the public, the government, business and commerce, this could suggest that the status of quantity surveying as a chartered profession is waning. Part of the relationship that the professions maintain with business, commerce and society is the expectation that member practitioners will provide an altruistic, up-to-date and reliable service, Schön (1983). RICS believes it plays a key role in advancing qualifications, standards and best practice across the built environment RICS (2019). A claim that sits before a backdrop of an increasingly adversarial construction industry that is susceptible to egregious financial failure.

Research literature has observed that the occurrence of conflict and dispute in construction is endemic and increasing in regularity and value. Research literature has also shown that there is a connection between matters of conflict and dispute and practice-based issues encountered in quantity surveying. Empirical data gathered for this research has shown that lower levels of competency identified by quantity surveying practitioners themselves relate to the causal link between conflict in construction and issues of practice. RICS attainment levels for Quantity Surveying and Construction APC competencies have not changed since 2006. These factors would tend to suggest that RICS professional education and training

policies for quantity surveyors could be reviewed with cognisance of current developments and customs in UK construction.

9.5. Professional knowledge and competence

Knowledge is fundamental to the professions and is the currency of their existence. This research evaluates professional knowledge and competency in professional practice. Quantity surveying is a knowledge-based profession that practises in a variety of disciplines throughout the UK built environment. Competence to practise as a chartered quantity surveyor is the result of knowledge acquisition and professional knowledge for quantity surveying is derived from a diverse range of epistemologies. RICS education and training for the majority of candidates to membership commences with the successful completion of an RICS accredited degree. RICS has accredited 26 quantity surveying degree courses at UK universities and this codified, fact-based knowledge is known as propositional knowledge. Other important sources of professional knowledge include tacit knowledge, explicit knowledge and continuing professional development (CPD). The acquisition and application of professional knowledge from these diverse sources contribute to professional competence. Current literature, (Eraut 1998; Sandberg 2000; Lester 2017) consider that competence has a linear definition starting from being 'just good enough' to the level of 'excellent' and this perceived distribution has been investigated through the empirical aspect of this research. Levels of professional knowledge and competence are the essence of professional practice on construction projects and are a fundamental influence on the efficacy of a project outcome.

RICS policies for the education and training of quantity surveyors rely upon university degree courses that have been accredited for content and standards by RICS. These university degree courses form the basic source of propositional knowledge for candidates to full membership of RICS. Academic entry requirements for the degree programme

together with graduation from the course also establish academic entry level standards to the profession. Professional 'know how' or 'knowing in action' referred to as tacit knowledge is described by Eraut (2007) and Smith (2009) as being acquired by direct supervision from line managers. Their research also refers to designated mentors with the rider that few take the role seriously. Other ways to acquire tacit knowledge include coaching from more senior colleagues, shadowing, short courses and asking questions of seniors. Tacit knowledge, it is suggested, leads to intelligent action and involuntary, intuitive and unconscious practice performance. Procedures that govern the RICS APC programme mandate that candidates will acquire tacit professional knowledge from the two year period of structured training. During this period of training the candidate is monitored and mentored by a counsellor and a supervisor. Provision of the appropriate work experience is the responsibility of the candidate's employer. None of these functions are monitored or regulated by RICS which tends to indicate evidential shortcomings in the programme.

RICS defines competence for the APC programme by setting prescribed levels of attainment for each APC competency in accordance with the importance that is attached to each defined function in the circumstances of practice.. As an example of the theory developed around competence, Lester (2017) suggests that the definition of competence should consider the ethos and ethics of the particular field of practice and a wider consideration for professionalism. This indicates that the concept of competence is complex and Eraut (1998) believes that any level of competence sits within a continuum but at the same time is context specific. Used rhetorically it may not give due consideration for policy objectives and the realities of practice problems that are to be addressed competently by chartered quantity surveyors. These theories, when compared with RICS policy, suggest that there may be a case for rethinking the concept of competence in relation to the skills and expertise required as a chartered quantity surveying member of RICS.

9.6. The research output

This chapter of the thesis brings together significant empirical findings, theoretical concepts and current research literature previously discussed in Chapter 2. The aim and objectives of this mixed method study is to explain, understand and evaluate RICS education and training for quantity surveyors. The outcome of RICS policies for education and training are assessed against issues of practice that exist in the current built environment market. The author chose research techniques that are mutually complimentary adopting qualitative experiential data to illuminate numerical findings from survey responses. That is, triangulation, discovering the same using different methods. The argument, advanced in narrative that follows, makes a connection between RICS APC competencies for the Quantity Surveying and Construction pathway and practice issues identified from the research data resource strands.

RICS APC is the procedure by which candidates pursuing full chartered membership have their knowledge and experience tested against each of the prescribed pathway competencies. Relationships identified in the research between competencies and issues of practice enabled simple ranking that identified a hierarchy of sensitive practice areas denoted by the number of issues attached to each competency. Ranking APC competencies in this way revealed that particular aspects of practice sensitive to practice issues were associated with matters of conflict and dispute that occurred on construction projects. Meaning that derived from ranking the competencies, identified areas of knowledge and expertise that were not sufficiently served by RICS policies for education and training, in the current UK built environment market

9.7. Aspects of the Assessment of Professional Competence (APC) programme

Included here is a brief reiteration of RICS final assessment procedures which have been discussed in more detail as part of the Literature Review within Chapter 3 Section 3.5.2

Following the successful completion of an RICS accredited degree, a candidate for membership commences a two year preparation period for the APC final assessment interview. Preparation is stated by RICS to involve structured training and Continuing Professional Development (CPD). The candidate's structured training is mandated by RICS to require the appointment of two supporting professionals, a Counsellor, who must be a chartered surveyor and a Supervisor who need not be a chartered surveyor. The Counsellor is responsible for continually appraising a candidate through the training period and 'signing-off' that a candidate has reached the required level for each pathway competency. The Supervisor has a mentoring role that ensures a candidate is obtaining the appropriate practice experience for each pathway competency.

Competencies that are 'Signed-off' must be recorded in the candidate's Summary of Experience together with compliant CPD records and a diary of work experience. Structured training is followed by a final assessment interview involving a panel of three chartered surveyors who assess the candidate's competency to practise, RICS (2018b). RICS APC is comprised of 22 pathways to chartered membership and each pathway consists of a prescribed framework of competencies which are designated by type and by the level at which they are required to be attained. Quantity Surveying and Construction is one of the pathways. Competencies are constituent parts of each RICS pathway and ensure candidates to membership are competent to practice RICS (2018d).

There are three types of competency, Mandatory, Technical Core and Technical Optional. Mandatory competencies are mandated for all RICS pathways and comprise generic aspects of practice applicable to every pathway. Technical Core competencies are particular to each pathway and include practice skills that specifically apply to that pathway. Technical Core competencies are prescribed by RICS for each pathway and are mandatory for that pathway. Technical Optional competencies are also specific to a particular pathway and quantity

surveying candidates must choose two from a list of ten. It is desirable to choose options that are relevant to the candidate's particular area of practice.

Competencies are prescribed by RICS to be attained at one of three levels, defined as follows:

- **Level 1** – knowledge and understanding
- **Level 2** – application of knowledge
- **Level 3** – reasoned advice, depth and synthesis of technical knowledge and its implementation

The combination of competency types and the RICS prescribed level of attainment constitute a framework for routes to chartered membership.

9.8. Quantity surveying competencies and issues of practice

This research has investigated RICS education and training for quantity surveyors and the following table displays the coordinated results from data resource strands. The table indicates quantity surveying competencies in the left hand column which are colour coded to denote the level at which they are required to be attained. The colours that represent attainment levels are as follows:

- **Level 3** – RED
- **Level 2** – GREEN
- **Level 1** – YELLOW

The remaining four columns contain practice issues identified in the research from current literature in Chapters 2, 3 and 4, case law in Chapter 5 and survey and interview data in Chapter 8. Each practice issue is noted briefly in the respective columns to provide an insight into the nature of problems revealed in the research. Issues noted in the survey and

interview columns are headlines for themes from each research technique. Each theme represents a collection of responses from practitioners who participated in the qualitative aspects of data gathering. Viewing the complete table taken as a whole provides a holistic picture of issues that currently beset quantity surveying practice. The purpose of the table is to display at a single point the results of research methods adopted for this study and to underscore the research argument. RICS pathway competencies are clearly ranked by the number of practice issues attracted to each competency.

COMPETENCY	LITERATURE	CASE LAW
Quantification and costing (of construction works) Level 3	<i>Failure to properly value the final account</i>	<i>Valuation of loss and expense</i>
	<i>Incorrect value of variations</i>	<i>Valuation of variations</i>
	<i>Failure to properly value loss and expense</i>	<i>Measurement issues</i>
	<i>Cash flow problems from undervaluation</i>	<i>Valuation og Construction</i>
	<i>Prolonged resolution of payment issues</i>	
	<i>Lack of measurement skills</i>	
Contract administration Level 2	<i>Incorrect administration of contract issues</i>	<i>Assessment of extensions of time</i>
	<i>Poor contract interpretation</i>	<i>Disputed administration issues</i>
	<i>Failure to enforce contract decisions</i>	<i>Poor contract administration</i>
	<i>Prolonged resolution of time and delay issues</i>	
	<i>Lack of interim awards for time and money</i>	
	<i>Failure to administer extension of time issues</i>	
Ethics, Rules of Conduct and professionalism Level 3	<i>Poor project governance</i>	
	<i>Lack of professionalism</i>	<i>Poor professional conduct</i>
	<i>Lack of professional ethics</i>	<i>Lack of reasonable skill and care</i>
	<i>Poor professional conduct</i>	
	<i>Lack of ethical training</i>	
	<i>Lack of self-regulation and self-awareness</i>	
	<i>Lack of competent practice</i>	
Diversity, inclusion and team working Level 1	<i>Low level of knowledge base</i>	
	<i>Lack of ethics in competitive tendering</i>	
	<i>Lack of project leadership</i>	<i>Poor relationship skills</i>
	<i>Lack of senior management ownership</i>	
	<i>Lack of soft skills, people skills, relationships</i>	
	<i>Problems from peripatetic working</i>	
	<i>Poor supply chain management</i>	
Client care Level 2	<i>Lack of senior management leadership</i>	
	<i>Lack of effective project team integration</i>	
	<i>Poor communication with the client</i>	<i>Poor record keeping</i>
	<i>Failure to establish clear project objectives</i>	<i>Poor client care</i>
Project finance (control and reporting) Level 3	<i>Lack of effective stakeholder management</i>	
	<i>Poor record keeping</i>	
	<i>Finance driven by price not value</i>	<i>Cost control issues</i>
Contract practice Level	<i>Failure to properly manage change</i>	<i>Inadequate cost budget advice</i>
	<i>Poor project documentation</i>	<i>Errors in project documentation</i>
	<i>Ambiguities in project documentation</i>	<i>Poor contract documentation</i>

3	<i>Drafting defective specifications</i>	<i>Extension of time issues</i>
	<i>Poor documentation and communication</i>	
Conflict avoidance, management and dispute resolution procedures Level 2	<i>Inability to resolve dissenting opinions</i>	<i>Valuation</i>
	<i>Poor dispute resolution skills</i>	<i>Documentation</i>
	<i>Limited knowledge of construction law</i>	<i>Administration</i>
Construction technology and environmental services Level 3		<i>Procurement</i>
	<i>Lack of knowledge for cost control</i>	<i>Lack of knowledge</i>
	<i>Lack of practical experience</i>	<i>Poor measurement skills</i>
	<i>Lack of current awareness</i>	
Procurement and tendering Level 3	<i>Lack of site experience</i>	
	<i>Failure to properly administer procurement</i>	<i>Poor procurement advice</i>
	<i>Poor procurement advice</i>	<i>Errors in project documentation</i>
Risk management Level 2		<i>Poor administration</i>
	<i>Unrealistic risk allocation for contract parties</i>	<i>Inaccurate cost budget advice</i>
	<i>Lack of engagement with critical realities</i>	<i>Cost control issues</i>
Communication and negotiation Level 2	<i>Lack of risk management skills</i>	<i>Valuation of construction works</i>
	<i>Lack of communication and relationships</i>	<i>Unresolved negotiations</i>
		<i>Poor record keeping</i>
Data management Level 1		<i>Poor professional conduct</i>
	<i>Poor project governance</i>	<i>Poor record keeping</i>
	<i>Poor project documentation</i>	<i>Poor project documentation</i>

COMPETENCY	SURVEY	INTERVIEW
Quantification and costing (of construction works) Level 3	<i>Greater measurement and costing skills</i>	<i>Measurement and costing skills</i>
		<i>Understand measurement</i>
		<i>Understand technology</i>
		<i>Limited access to mentoring</i>
Contract administration Level 2		
	<i>Greater construction law knowledge</i>	<i>Limited knowledge of contract law</i>
	<i>Poor project management</i>	<i>No experience of contract protocol</i>
		<i>Limited contract administration</i>
Ethics, Rules of Conduct and professionalism Level 3		<i>Limited access to mentoring</i>
	<i>Lower levels of professional standards</i>	<i>Higher ethical standards</i>
	<i>Limited access to mentoring</i>	<i>Higher professional standards</i>
	<i>Variable ethical standards and principles</i>	<i>Understand professionalism</i>
		<i>Low workplace standards</i>
Diversity, inclusion and team working Level 1		<i>Ethical standards only notional</i>
	<i>Need for soft skills</i>	<i>No people skills ,soft skills</i>
	<i>People skills self-assessed as low</i>	<i>No experience of negotiation</i>
		<i>Negotiation techniques</i>
		<i>Limited presentation skills</i>
Client care Level 2		<i>Limited access to mentoring</i>
	<i>Lower levels of people skills</i>	<i>No relationship training</i>
		<i>Limited face-to-face experience</i>

Project finance (control and reporting) Level 3	<i>Poor advanced financial management</i>	<i>Lack of experience opportunities</i>
	<i>Knowledge of economics of construction</i>	<i>Limited access to mentoring</i>
Contract practice Level 3	<i>Lack of effective mentoring</i>	<i>Limited knowledge of contract law</i>
	<i>Lower quartile competency ranking</i>	<i>Low levels of practical experience</i>
Conflict avoidance, management and dispute resolution procedures Level 2	<i>Greater knowledge of dispute resolution</i>	<i>Knowledge of construction law</i>
Construction technology and environmental services Level 3	<i>Greater construction technology theory</i>	<i>Need for more practical training</i>
		<i>Need for greater technical skills</i>
Procurement and tendering Level 3	<i>Lower trends in procurement skills</i>	<i>Poor contract knowledge</i>
		<i>Limited practical experience</i>
Risk management Level 2	<i>Poor financial management</i>	<i>Lack of knowledge and training</i>
	<i>Unrealistic cost budget advice</i>	<i>Limited in-depth experience</i>
Communication and negotiation Level 2	<i>Lower quartile people skills and negotiation</i>	<i>Need for negotiation skills</i>
Data management Level 1	<i>Need for greater computer literacy skills</i>	<i>The practice of record keeping</i>
		<i>Sharing project data</i>

Table 9.1. Quantity Surveying competencies and issues of practice

Table 9.2 contains a numerical presentation of the number of practice issues set against each competency which provides a ranked hierarchy of competencies that are particularly sensitive to problems of practice. Discussions that follow interrogate aspects of each competency as defined by RICS together with policies that govern acquisition of practice knowledge and the required level of attainment. The following narrative also includes an assessment of the extent to which RICS consider each competency to be relevant in dealing with practice issues encountered in the current built environment market.

RICS Competency	Number of practice issues identified in...				Total
	Literature	Case Law	Survey	Interview	
Quantification and costing (of construction works) Level 3	6	4	1	1	12
Contract administration Level 2	7	3	2	0	12
Ethics, Rules of Conduct and professionalism Level 3	8	0	0	2	10
Diversity, inclusion and team working Level 1	7	0	0	1	8
Client care Level 2	4	2	0	0	6
Project finance (control and reporting) Level 3	2	2	2	0	6
Contract practice Level 3	4	2	0	0	6
Conflict avoidance, management and dispute resolution procedures Level 2	3	0	2	0	5
Construction technology and environmental services Level 3	0	0	3	2	5
Procurement and tendering Level 3	2	1	0	0	3
Risk management Level 2	3	0	0	0	3
Communication and negotiation Level 2	1	0	0	1	2
Data management Level 1	0	0	1	0	1

Table 9.2 RICS competencies and identified issues of practice

The table highlights 13 sensitive quantity surveying competencies that are prominent in the research findings. Responses from practitioners during interviews and their scores recorded from survey returns in Chapter 8 accord with observations made in current literature and the subject matter of litigation identified in Chapter 5 Sections 5.2. 5.3. RICS policies for professional education reflect how important the institution considers a competency to be for current practice. Policies that have mandated, post-graduation, that the APC candidate does not receive any formal education other than CPD activities. Practice skills, experience and expertise are expected to be obtained through employment and guidance from a counsellor and supervisor. The required level of attainment set by RICS reflects its awareness of current practice issues that test the practitioner in the realities of front line problems. This research has established a link between practice-based issues of quantity surveying and the pathway competencies that chartered members are required to attain. The following discussion places each competency and the associated RICS policies for education and training in a test of relevance and makes an assessment of the extent to which these policies prepare a practitioner for the reality of practice issues.

9.9. Sensitive competencies and the relevance to current practice issues

The purpose of this critique is to review the 13 most sensitive competencies identified in Table 9.2. The competencies are discussed one at a time in order of ranking indicated in the table, offering a comment on each accordingly. The review defines the competency using RICS definition wording and goes on to balance these requirements with the reality of RICS assessment procedures and practice issues identified from research methods. A review of each competency includes an appraisal of how relevant these RICS requirements and procedures are for practice issues encountered in current UK built environment market. The generic factors in RICS policies that apply to each and every competency include:

- Post-graduation, professional knowledge, expertise and practice skills are stated by RICS to be acquired through a period of structured training through work experience

from employment, CPD activities and advice from a counsellor and supervisor. None of these functions are monitored or regulated by RICS and as such they remain a subjective variable of the practitioner's vocational training.

- An assessor member of an APC Final Assessment interview panel is allocated by the RICS prescribed interview programme timeline, less than one and a half minutes to assess each competency. Interviewing skills vary throughout the assessor pool and this aspect of the pathway to full chartered membership also remains a subjective variable.

Successfully completing a period of structured training and assessment policies that confer chartered membership on a candidate, it is conceivable that a quantity surveying practitioner could be immediately thrust into the rigours of front-line practice without any further training or education. The consequences emanating from this scenario may contribute to issues raised within Chapter 4.

Comments that follow regarding each of the sensitive competencies include extracts taken from the Pathway guide Quantity Surveying and Construction, RICS (2018). The extracts are included to provide the genuine basis upon which to compare and contrast relevance for current practice issues. In respect of all competencies, the research revealed that after completing a period of structured training and successfully being assessed competent for full chartered membership, practitioners self-assessed themselves to be lacking in knowledge and expertise for these important areas of practice. The question raised by this research is the extent to which RICS education and training for quantity surveyors prepares the practitioner for the realities of practice.

9.9.1. Quantification and costing (of construction works) Level 3

This competency is aptly described by RICS as a Core Competency mandatory for the Quantity Surveying and Construction pathway and it is required to be attained to Level 3 which is defined by RICS as:

'...Reasoned advice, depth and synthesis of technical knowledge and its implications.'

The candidate is expected to demonstrate competency as follows:

'Advise on appropriate methods of quantification and costing for specific projects. Take responsibility for the preparing and issuing pricing documents. Price or analyse such documents. Give advice on and/or supervise the valuation of construction works throughout a project.'

More specifically the required activities, knowledge and skills include:

- Advising on appropriate methods of measurement and costing
- Selecting of appropriate pricing documents
- Negotiating and agreeing the valuation of construction works at various stages of the project such as the contract sum, construction and final account

RICS (2018)

These requirements at **Level 3** must be supported by a further **7** areas of knowledge attained at **Levels 1 and 2**.

Quantification and costing of construction works are the essence of quantity surveying practice. The skill and expertise necessary to properly value construction works including variations, interim application for payment and the compilation of a final account are essential. Valuation and costing also encompasses matters of loss and expense and entitlement following a breach of contract. Practice know-how in these sensitive areas cannot be acquired from codified propositional knowledge and yet RICS policies exhibit a light touch approach post-graduation. Practitioners have stated that measurement is not taught as part of their propositional knowledge acquisition from an RICS accredited degree. The majority of practitioners have self-assessed themselves to be less than competent with measurement skills and wish for more expertise in that practice function (See Table 9.2). Case law described within Chapter 5 Sections 5.2.and 5.3. indicates consistent problems with measurement and valuation that have led to litigation and claims of negligence against chartered quantity surveyors.

The basis of most circumstances surrounding conflict and dispute in construction involve quantum and valuation of construction works and it is well documented that the occurrence of these circumstances of conflict are steadily increasing, Allen (2016). RICS policies and procedural documentation do not clarify how a candidate for chartered membership acquires the skill and expertise necessary for this important competency. The process and procedures implemented by RICS rely on a meaningful engagement from the candidate's employer, counsellor and supervisor, none of which are monitored or regulated by RICS and remain an important variable for the candidate's acquisition of professional skill and expertise.

9.9.2. Contract administration Level 2

This competency is optional for candidates undertaking the Quantity Surveying and Construction pathway. The pathway guide includes a list of ten optional competencies from which the candidate must choose two. Contract administration is required to be achieved to Level 2 which is defined by RICS as:

'...application of knowledge'

The candidate is expected to demonstrate competency as follows:

'...Implement administrative procedures necessary to run a construction contract'

More specifically examples of the knowledge comprised within this level are:

- Issuing instructions
- Dealing with payment provisions
- Managing change procedures
- Involvement with dispute avoidance
- Dealing with completion and possession issues
- Issuing certificates

RICS (2018)

These requirements at **Level 2** must be supported by a further **3** areas of knowledge attained at **Level 1**

As an optional competency not all quantity surveying candidates will choose to pursue contract administration which as such reveals an important omission in the practitioner's knowledge and expertise. Most aspects of quantity surveying practice will involve the administration of a contract whether as a chartered quantity surveyor representing a client or fulfilling professional obligation under the New Engineering Contract (NEC). Contractor's surveyors are also required to administer subcontracts with the supply chain and both these professional functions require knowledge and expertise to competently accomplish aspects of practice listed above. In order to competently administer a contract, a chartered quantity surveyor requires legal expertise in contract law, construction law and construction technology and process.

Contract administration is recognised by this research to be a sensitive area of practice, highlighted by current literature and case law and empirical data (See Table 9.2). The practice functions referenced in RICS examples of knowledge requirements are all critical to the management and administration of construction projects. Knowledge and expertise in these practice skills are hard won and require on-the-job practical experience and robust supervision and mentoring. This research through its knowledge strands has referred to a need for practical experience, greater knowledge of the construction process, more practical skills, a greater understanding of contract law and construction law and a need for structured mentoring. However RICS policies and procedures for professional education and training stipulate Contract Administration to be an optional competency.

9.9.3. Ethics, Rules of Conduct and professionalism Level 3

This competency is a Mandatory Competency for all pathways to membership and is required to be attained to Level 3. RICS defines Level 3 as:

'...Provide evidence of application of the above in your area of practice in the context of advising clients.'

More specifically RICS provides examples of activities and knowledge comprised within this level as follows:

- Dealing with a conflict of interest
- Dealing with a complaint
- Handling client's money
- Setting up professional indemnity insurance
- Registration of a firm with RICS

These requirements at **Level 3** must be supported by a further **22** areas of knowledge attained at **Levels 1 and 2**.

Every APC candidate is required to have successfully completed the RICS Ethics online training module which provides knowledge and information about ethics in practice followed by exercises requiring responses to a series of situations and scenarios RICS (2018). RICS prescribed timeline for the APC Final Assessment Interview includes a ten minute closing period at the end of the procedure for the chairperson to assess the candidate's knowledge and experience in ethics, rules of conduct and professionalism. Training, knowledge, experience and competency in these important factors of professional practice are largely left with the candidate to pursue and guidance from employers, counsellors and supervisors is a variable that is not policed. Empirical data generated by this research established that chartered quantity surveyors wished for higher levels of professionalism and ethical standards in practice. Current literature and case law (See Table 9.2) also identified the need for higher standards in these aspects of practice. Post-qualification to membership, RICS does not monitor or regulate ethical standards or levels of professionalism in practice. These issues are currently addressed by RICS regulation only following a complaint against a chartered member.

9.9.4. Diversity, inclusion and team working Level 1

Soft skills are apparent from the definition of this competency which is a Mandatory Competency required to be attained to Level 1 and defined as:

'...Demonstrate knowledge and understanding of the principles, behaviour and dynamics of successfully working in a team.'

Examples of knowledge required to comprise this competency include:

- How team members are selected and appointed
- The role played by the various team players
- The importance and business value of diversity in a team
- Formal communication processes within the team
- Inclusive communications
- How partnering and collaborative working affects the team
- Internal diversity and inclusion policies, including any applicable to non-discrimination or anti-harassment in the workplace
- Knowledge of unconscious bias
- Supply chain management

People are fundamental to the construction process and relationships that contribute and impact on a project outcome are a measure of how successful a project has been. All data resource strands in this thesis refer to soft skills, people skills, relationship skills and the humanities, all of which are considered to be an essential part of a quantity surveying practitioner's knowledge and expertise. The research data also identifies a lack of competence in this area of practice. Practitioners themselves have stated how important these skills are and how they, the profession and construction would benefit from education and training in these areas. RICS maintains that this competency is attained to Level 1 which does not reflect the importance of people skills in the current UK built environment market.

9.9.5. Client care Level 2

More soft skills are apparent in this competency which is a Mandatory Competency required to be attained to Level 2 and defined as:

'...Provide evidence of practical application of the principles and practice of client care in your area of practice.'

Activities and knowledge required for this competency include:

- Establishing client's objectives
- Confirming client's brief
- Establishing scope of services
- Calculating fees for professional services
- Compiling an appointment document
- Establishing project stakeholders and their status
- Setting up communication systems with a client and stakeholders
- Issuing reports to a client e.g. cost reports
- Dealing with a complaint
- Measurement of KPIs
- Analysing the data gathered through the client briefing process and formulating a detailed client brief

These requirements at **Level 2** must be supported by a further **10** areas of knowledge attained at **Levels 1**.

An appraisal of the activities and knowledge requirements listed above could result in the conclusion that these are matters for a client-side quantity surveying practitioner, however in reality many chartered quantity surveyors practice in construction companies. The RICS definition of this competency has not changed in the last 13 years, RICS (2006). The acquisition of knowledge and expertise in these areas of practice require careful guidance particularly for candidates who work for contractors. Level 2 requires an application of

knowledge and fortunately as the role of construction companies has expanded within current contractual obligations there is a requirement for practitioners to fulfil at least some of these functions. RICS policy documentation remains in the past and does not accommodate these changes. This research has identified aspects of poor practice within this competency and the consequences for clients and contractors often result in litigation as discussed in Chapter 5 Sections 5.2 and 5.3.

9.9.6. Project finance (control and reporting) Level 3

This competency is about advanced financial management of construction projects and it is a Core Competency required to be attained to Level 3 defined as:

'...advise of strategies and procedures to control predicted expenditure in line with budget.'

Activities and knowledge required for this level include:

- Implementing change control procedures within the contract
- Establishing reporting regimes/protocols
- Using risk management and analysis techniques

These requirements at **Level 3** must be supported by a further **8** areas of knowledge attained at **Levels 1 and 2**.

Advanced financial management was considered by practitioners themselves to be a competency sensitive to issues of practice and lower levels of practice performance. Contract sums are increasing and the skill and expertise in managing these vast sums are becoming more and more under scrutiny. Cross Rail, HS2, the Elizabeth Line, Hinckley Point are all examples of budgeting and costing problems. Public and private owners of planned construction and infrastructure projects are well known to set budgets as low as possible to attract funding which appears in conflict with provision of prudent, altruistic professional advice expected from a chartered quantity surveyor, Smith (2019). This clearly can be

challenging for a practitioner. The acquisition of skill and expertise in the financial management of a construction project is defined by RICS to be obtained during the two year period of structured training. Whilst newly qualified chartered members may not be involved in senior responsibilities for advanced financial management, it is difficult to understand where and how knowledge and expertise in these complex functions are obtained under current RICS policies. As referenced in this research data; *'the need for greater advanced financial management skills'* and *'greater knowledge of the economics of construction'* and *'the need for more practical training'*, all reflect the relevance of current RICS education and training policies.

9.9.7. Contract practice Level 3

This competency covers more aspects of contract administration and to an extent overlaps administrative functions, it is a Core Competency required to be attained to level 3 which is defined as:

'...Provide evidence of reasoned advice, prepare and present reports on the selection of the appropriate form of contract and warranties for your chosen procurement route. This should include advising on the most appropriate contractual procedure at the various stages of a construction or other contract.'

Knowledge and activities required at this level include:

- Selecting the appropriate form of contract and/or sub-contract for your chosen procurement route
- Advising on the most appropriate contractual procedure at the various stages of a contract
- Evaluating the appropriateness and implications of proposed contractual amendments

These requirements at **Level 3** must be supported by a further **9** areas of knowledge attained at **Levels 1 and 2**.

The knowledge and activities described above are of a legal nature and expertise to the extent required to competently fulfil these activities is advanced in a legal sense. Practitioners inform that they would benefit from greater knowledge and understanding of contract law and construction law. In view of the legal knowledge required to administer these matters, RICS policies of education and training leave the practitioner to the vagaries of employment experience and mentoring by senior staff. The effectiveness of these policies is not monitored nor is there any regulation and practitioners have stated the need for more 'structured' mentoring. Level 3 requires the knowledge and expertise to provide reasoned advice which in turn requires the necessary knowledge and experience to be in place from those who are mentoring and in the same way, from those who are assessing. Current literature referenced within Chapter 4 Section 4.4 identifies instances of poor project documentation, ambiguities and errors that have resulted in practice issues. Where these issues fall within the linear definition of competence remains unclear in RICS policies.

9.9.8. Conflict avoidance, management and dispute resolution procedures Level 2

This competency is mandatory to level 1 but optional to level 2 therefore at best it can be attained to level 2 however it is unusual for a candidate to select it as an option. It is defined here at its highest level 2 as:

'...Provide evidence of practical application in your area of practice having regard for the relevant law.'

Knowledge required to attain this level comprise:

- Direct experience of conflict avoidance and management and dispute resolution procedures including Mediation, Adjudication, Arbitration, Expert Determination, Dispute Boards etc.
- Compiling evidence for use in dispute resolution procedures.

These requirements at **Level 2** must be supported by a further **4** areas of knowledge attained at **Levels 1**.

Comments made regarding the previous competency equally apply here. Conflict is rife in construction and increasingly is a matter that has to be confronted by a chartered quantity surveyor practitioner. The default position often taken by organisations operating in the current UK built environment is to engage the services of an expert. This effectively limits the extent of professional experience available to both junior and senior quantity surveyors. RICS in the last 13 years has not changed its policies and conflict avoidance, dispute resolution continue to be only mandatory to level 1 and optional to level 2, RICS (2006). The lack of expertise in the administration of conflict and dispute for front-line quantity surveying practitioners only serves to create a pathway for the expert and the consequential burden of burgeoning fees for stakeholders in a conflict and dispute situation on a construction contract.

9.9.9. Construction technology and environmental services Level 3

The research identifies construction technology and process to be a sensitive area of practice. Knowledge of the construction process is fundamental to measurement, costing, administration and understanding matters of conflict and dispute. This is a Core Competency required to be attained at Level 3 defined as:

'...Advise on the selection and application of particular processes within your area of experience. This should include liaison with specialists and consultants to deliver project specific design and construction solutions.'

Activities and knowledge at Level 3 include:

- Advising on the choice of construction solutions for your project
- Reporting on the impact of different design solutions and construction processes on cost and programme

These requirements at **Level 3** must be supported by a further **7** areas of knowledge attained at **Levels 1 and 2**.

Practitioners have stated the need for a greater understanding of construction technology theory, more practical training and greater technical skills. Level 3 activities and knowledge described above requires a wide range of experience and knowledge as a basis for providing reasoned advice. As with other competencies, it is not clear from RICS policies how knowledge and expertise in construction technology and processes is acquired to the extent that reasoned advice is meaningfully feasible. The practitioner is expected to comply with a requirement that is not monitored or regulated.

9.9.10. Procurement and tendering Level 3

Procurement is another fundamental function of quantity surveying for client-side and contractor practitioners. It is a Core Competency required to be attained to Level 3 which is defined as:

'...give reasoned advice on the appropriateness of various procurement routes. Manage the tendering and negotiation process and present reports on the outcome.'

Activities and knowledge requirements comprise:

- Evaluating the appropriateness of various procurement routes
- Managing the tendering and negotiation process
- Preparing procurement and tendering reports

These requirements at **Level 3** must be supported by a further **7** areas of knowledge attained at **Levels 1 and 2**.

Poor procurement advice is a practice issue identified in current literature referenced within Chapter 4 Section 4.4 together with a failure to properly administer the procurement process. Project documentation is seen to contain errors and ambiguities and ethical aspects of managing the procurement process are recognised as another aspect of quantity surveying practice that is sensitive to lower levels of professionalism. Practitioners have wished to improve current levels of professionalism together with the need for higher

standards of ethics in practice. Whilst RICS refers generically to high professional standards, it is not clear how this aspiration translates into policies and procedures.

9.9.11. Risk management Level 2

This is an Optional Competency required to be attained at level 2. As an option it is not necessarily an area of expertise pursued by every candidate. Level 2 is defined as:

'...Apply your knowledge to carry out risk assessments taking into account all relevant factors. Understand the application of the various methods and techniques used to measure risk.'

Knowledge required for this competency at level 2 is defined as:

- Contributing towards the identification of risk
- Identifying who owns risk in relation to the chosen procurement route on your project
- Contributing towards strategies to mitigate risk
- Contributing data towards the qualification of risk
- Considering the effect of risk on programme and management cost specific to your project

These requirements at **Level 2** must be supported by a further **6** areas of knowledge attained at **Levels 1**.

Construction in the built environment is high risk, as is the provision of professional services to public and private entities that operate within this sphere of economic activity. Current literature referenced within Chapter 4 Section 4.4 identified poor risk management skills within the quantity surveying profession and the lack of engagement with critical realities and unrealistic risk allocation between parties to a construction contract. Risk exists because all is not known, Flannagan and Norman (1999). All of which indicate that lower levels of practice competency exist for this particular aspect of quantity surveying practice. In the

face of a rapidly changing industry, risk management has been optional competency in RICS policies and procedures for the last 13 years, RICS (2006).

9.9.12. Communication and negotiation Level 2

This is a Mandatory Competency required to Level 2 which is defined as:

'...Provide evidence of practical application of oral, written, graphic and presentation skills that are appropriate in a variety of situations, specifically including where negotiation is involved.'

Activities and knowledge required at level 2 are defined as:

- Writing letters or other formal documents
- Compiling a report
- Compiling minutes of meetings
- Producing pricing documents
- Delivering reports at meetings
- Taking part in interviews e.g. for contractor selection
- Giving presentations to staff or project teams
- Negotiating a contract sum or final account
- Agreeing the value of an instruction

These requirements at **Level 2** must be supported by a further **8** areas of knowledge attained at **Levels 1**.

Communication and negotiation are recognised soft skills that practitioners have identified as being sensitive to lower levels of competency. A lack of communication skills and the ability to negotiate are both people skills that require the establishment of relationships. Practitioners have stated that this is an important area of professional development that should be given more prominence in policies of education and training for quantity surveyors. The humanities and human skills are difficult to acquire without being given the

opportunity of experience. Practitioners believe that the ability to negotiate is essential in the current UK built environment market and that it is at the heart of managing and avoiding conflict and dispute.

9.9.13. Data management Level 1

This is a Mandatory Competency to Level 1 which is defined as:

'...Demonstrate knowledge and understanding of the sources of information and data, and the systems applicable to your area of practice including the methodologies and techniques most appropriate to collect, collate and store data.'

Knowledge for this competency to level 1 comprises the following:

- The use of published sources of data, particularly BCIS
- How data is collected, analysed and stored within your employer's organisation
- How project information is stored within your employer's organisation
- How electronic database systems work
- The use of computerised central project databases or Building Information Modelling, the benefits, challenges and dangers
- How technical libraries are set up and used
- Legislation applicable to data management and data access

Managing data and the associated IT skills are another area of practice that chartered quantity surveying practitioners recognise exhibit low levels of competency. Computer literacy is a function of measurement, communication, record keeping and data processing. Current professional practice has become global involving 'big data', Building Information Modelling (BIM), advances in digital technologies and artificial intelligence (AI) however, RICS education and training policies continue to maintain data management as a Level 1 competency for the profession.

9.10. Other relevant interview themes surrounding RICS and APC

Participants to the interviews, as discourse developed through the semi-structured format, raised other themes broadly relevant to the research concepts, assumptions and argument. These themes are briefly revisited below in recognition of rich data resulting from the interviews and to provide an indication of practitioner views and experiences of the 'everyday' on the periphery of this field of research into the professions and professional education for quantity surveyors.

9.10.1. Professionalism

Comments broadly surrounding professionalism were made by eleven of the 22 interview participants and 27 comments were made in total regarding this particular theme. The comments demonstrated considerable distaste for the extent of professionalism and ethical standards displayed in matters pertaining to Carillion and Grenfell Tower. Practitioners believed that these matters involved corporate arrogance, negligence, misreporting and questionable morals and the inevitability that RICS members were involved in these issues. Others felt that a clear understanding of codes of conduct, professionalism and ethics is essential to be a true professional but they recognised that what was taught in professional education was not evidenced in actual practise. This led to expressing a desire for more regulation by RICS to uphold these professional standards. Without high standards of ethics and professional conduct a future for the profession of quantity surveying, they felt, is uncertain.

“Carillion... acting in an ethical manner...should never...in this position”

“...corporate arrogance, negligence, misreporting, questionable morals”

“...understand what it means to be a professional”

Current legislation was thought to be a driver for RICS to react with the publication of practice standards and codes of conduct, for example regarding money laundering and the Bribery Act and this reaction was not necessarily a proactive mandate from the institution.

Some believed that ethical standards within the construction and property sectors were traditionally very low and did not appear to be improving. Accountability and the morality of standing on a personal believe in professional principles of conduct and ethics are areas of practice that are not often evident in reality. Whilst most practitioners acknowledged that policies were in place to support standards of professionalism, it was felt that more could be implemented through CPD and regulation. Generally, practitioners wished for higher standards within the quantity surveying profession and they did not want to see a ‘dumbing down’ of policies relating to professional education and training.

“...I do believe that the driver...has been legislation”

“I think ethics within construction and property is probably at its lowest...”

“...what we did in practice was completely different from what is taught...”

9.10.2. Practical training

The theme discussed here is the need for practice ‘know-how’ and nine of the 22 participants made a total of 29 comments in this regard. Practitioners recognised that practical training was a variable aspect of their professional development. They appeared to be left to their own devices in many respects and they simple learnt ‘know-how’ from doing in the workplace. This tends to suggest that without supervision, mistakes will be made and young practitioners were just muddling through making the same mistakes over time due to untutored inexperience. Some did not recall having received any particular practical training at all and that the practical aspect of their training was mostly ignored. Others stated that they were not prepared for the challenges of practice and the absence of tacit knowledge in dealing with difficult practice scenarios could never be addressed by CPD. Other comments touched on mentoring and a wish for an opportunity to confide in a senior colleague for professional coaching, for some this included an open-door policy in the workplace, but not for all. The concept of mentoring is addressed in other parts of the thesis and it was apparent from the interviews that for many it was a serious omission from their professional development.

“...really about learning on the job...”

“...I don't recall having or receiving any training particularly”

“...should have somebody that they can confide in...”

The participants recognised differences between working practices client-side and working for contracting organisations and the difficulties in accommodating all disciplines within policies of education and training. Construction is a site-based operation and a lack of site experience was expressed in a number of the interviews. The participants were cognisant of the immergence of IT at the expense of practical site experience and how their propositional education did not relate to day-to-day business. Female respondents described the masculine environment of construction and how their professional development was difficult and challenging under these circumstances, where senior colleagues did not offer the appropriate level of support. The acquisition of knowledge and understanding for practice ‘know-how’ was explained as being quite overwhelming. In this regard it was felt that support from RICS was minimal and for the most part professional development was an individual responsibility. The thrust of these comments were that there was need for real practical experience together with responsible mentoring to improve professional standards and practise.

“...either a contractor's QS or a PQS...they're both completely different...”

“...I didn't see any of them out on site...”

“...know exactly the right way of doing things was quite overwhelming...”

9.10.3. Propositional education and practice

The definition of boundaries for this research project stated that the 26 university degree courses accredited by RICS would not be assessed for standard or content. However the interview did contain a question that asked for the participant's experiences from this aspect of their professional development. The following text is brief abstract of comments made during the interview. Ten of the 22 interview participants made a total of 16

comments about this theme. Prominently it was stated that the accredited degree courses did not naturally link to the RICS APC programme and did not explain the entity of RICS or the competencies contained within the APC process. There appeared to be a lack of alignment with RICS and its educational intent. Others believed that their degree education covered quantity surveying in a broad sense without enough emphasis on detailed technical knowledge which resulted in graduates entering the profession not having core skills or an appreciation of professional ethics. Some practitioners felt that RICS should liaise more closely with academia to ensure that a workable continuity existed between academic teaching and matters of practice. Undergraduate academic A level entry requirements were challenged and considered not fit for purpose whilst the APC process was not a source of knowledge acquisition but more of procedural compliance.

“...it didn’t explain what the RICS was about...”

“...site-based activities of what we are actually doing out there”

“RICS desperately needs to work really closely with universities...”

Practitioners identified a gap between their propositional knowledge and that which was necessary for practice. A critique in current literature refers to ‘oven ready’ graduates, K. Galloway and Harris (2012). University education was referred to as covering ‘mercurial’ topics not necessary relevant for quantity surveying practice. Others recognised the knowledge industry which should include working through examples of practical issues linking to site-based activities and what was actually going on ‘out there’. They felt that the universities have not really reached out to professional practice and the profession has not really reached out to universities.

“...university leads haven’t really reached out to professional practice”

“...gap between a graduate and a chartered professional...”

“...education and degree, that’s all the business is...”

9.10.4. The humanities, soft skills

This theme is addressed in other parts of the thesis however the comments discussed in this section demonstrate a rich strand of data in support of the research argument. Six of the 22 interview participants made a total of ten comments regarding people skills and establishing relationships. Soft skills were considered by some to be an unimportant aspect of early career development but it appears to have quickly become apparent that engaging with other to resolve a problem applies at all level of practice. Communication and negotiation are a means to avoid the crystallisation of conflict and dispute leading to the prospect of expensive consultancy fees. Others referred to the importance of meeting people, clients, contractors and subcontractors and developing relationships that benefit professional and project performance. Others identified the importance of successful client interface and having younger staff able to represent their employing organisation under these circumstances. These comments confirm that practitioners believe soft skills, relationship skills, the ability to effectively engage with others are very important for good practice but in this part of the research data it was not apparent whether they managed to adopt these skills.

“...soft skills are important...”

“...to have agreed that settlement...without...racking up consultancy fees...”

“...having surveyors that you can put in front of clients...”

9.10.5. Measurement and technology

These are both fundamental functions of quantity surveying practice and the comments abstracted here are in support of the data analysed in Chapter 8. Ten of the 22 interview participants made a total of 18 comments regarding this theme and it was thought that measurement skills and the technical expertise surrounding this skill were lacking in professional education. The bread and butter skills of quantity surveying and an in-depth

understanding of methods of measurement were very much misunderstood. Others referred to the fact that currently measurement is out-sourced and therefore an opportunity to gain experience in the skill is diminished. Practitioners stated from their experience that measurement and technology were not taught as part of their undergraduate education which was considered to be an omission for these key practice functions of quantity surveying. Generally there was a belief that the core quantity surveying skills of measurement and technology were neglected and often avoided by practitioners through ignorance and lack of competence.

“I think the QS technical area’s been very much misunderstood...”

“...they can’t get the experience because their firms don’t do it...”

“...core skills...go back to technology and measurement...”

9.10.6. RICS specifically

Throughout the interviews many participants included impromptu comments about their impressions and experiences of RICS and for this research these comments provide an impression of the ‘every day’ background to this research argument and the problems of practice. Sixteen of the 22 interview participants made a total of 36 comments regarding this theme. Many thought there exists disconnect between RICS and its membership, they felt that RICS was not taking responsibility for its obligations and was not doing enough to regulate the profession. Others felt that employees of RICS do not have cognisance of what the membership needs to know for competent practice, standards are falling and processes are being ‘dumbed down’. The extent of ‘dumbing down’, it is felt, prevents a meaningful succession of the profession generation on generation. Practitioners felt that RICS had distanced itself from the membership and retreated to an ivory tower issuing standards from London without a real concern that the standards were actually being adopted. There was also a view that RICS is being run as a business for the benefit of the senior management team in London.

The level of competency was discussed and it was recognised that the RICS definition of competency was not clear and allowed for an element of subjectivity that was influenced by market forces and the bigger picture. Similarly others felt that the depth of knowledge required by the APC process was not detailed enough. The APC process was considered to be a means to an end that is cynically exploited by larger organisations at the expense of SMEs. The institution was observed to be coasting in the belief that all was well when in fact standards were falling without due consideration for the current demands of practice. Regarding Carillion and Grenfell Tower practitioners felt that RICS did not want to be associated with serious failure and responded to these critical issues by simply suggesting where things may have gone wrong. Whilst these issues are occurring in the UK, RICS appeared to be more interested in global expansion and practitioners felt that this was disappointing for the UK membership where they believed that many clients do not understand what a quantity surveying professional actually does.

“...I feel that the RICS aren’t taking responsibility...”

“People at RICS don’t have knowledge about what their members are expected to know”

“...I don’t think a lot of clients understand what a quantity surveyor does”

Membership fees attracted a number of comments and it was suggested that value for money was an emotive issue. Practitioners believed that RICS was brand-orientated and that Modus, the RICS monthly journal, was not really relevant to the ‘every day’. RICS conferences and training modules were considered to be prohibitively expensive without any real concessions for members.

“...I would say it’s about RICS making a profit, not necessarily about improving training”

“...the pricing and the accessibility...is an issue for a lot of people”

“...I don’t get anything out of the RICS. I don’t see how they benefit me...”

9.11. The scale of the everyday individual experiences

An RICS APC candidate on the Quantity Surveying and Construction pathway who successfully negotiates the Final Assessment Interview and emerges as a Chartered Quantity Surveyor could conceivably be thrust into front-line practice. As often stated by many a chairperson of an interviewing panel;

“...tomorrow you could set up in practice as a Chartered Surveyor...”

This statement is perfectly correct and in that regard the practitioner could be advising the public, industry and commerce. However, from this research, current research theory, empirical data and the author’s reflections of practice, the statement has evidential shortcomings. A newly qualified chartered quantity surveyor may not be fully conversant in measurement; have limited experience and competence in project financial control and commercial management; have a poor understanding of construction technology and processes; limited experience of project administration; be unsure in establishing relationships and conducting a negotiation; have a limited knowledge of construction law, legal protocol, dispute avoidance and management; have limited experience of risk management; and may not clearly understand standards of professional conduct and ethics. This is the scale of the ‘everyday’ in quantity surveying education, training and practice.

9.12. Summary of the Chapter

This critical review discussed the 13 most sensitive quantity surveying competencies identified through the research techniques adopted for this study. Comments that surround each competency indicate the extent to which each prepares the practitioner for the rigours of practice. RICS policies that govern the APC process stating the level at which each competency must be attained serve as a measure of how relevant RICS cognisance is for issues of quantity surveying practice in the current UK built environment market. Previous comments have alluded to the subjective variables of RICS APC and the interviewing procedure continues to suffer from a shortage of skilled and experienced assessors. Faced

with the problems of administering the allocation of assessors for 13 interview centres throughout the UK, from what was a pool of enthusiastic volunteers; RICS has now mandated that any member wishing to become a new assessor, must now pay a fee to the institution for training, RICS (2019). Discussions included in this chapter have focussed on quantity surveying functions that display lower levels of practice competency. These functions of practice have been appraised through the lens of RICS policies and procedures. The chapter concludes with a section that revisits rich data gathered from interviews which includes comments made by practitioners surrounding the research argument and gives a flavour of the scale of everyday experiences from the realities of 'out there'.

10. CONCLUSIONS AND RECOMMENDATIONS

10.1. Introduction

Quantity surveying is a profession that plays a major role in the administration and financial management of construction projects in the current UK built environment market. The level of expertise and competence demonstrated by a practising quantity surveyor has consequences for the success or failure of a construction project. RICS is one of the larger professional bodies with jurisdiction within the UK built environment and is responsible for the education and training to full chartered membership of practising quantity surveyors. Issues of practice encountered by chartered quantity surveying practitioners invariably involve matters of conflict and dispute between parties to a construction contract. Rationale for this research is the continuing increase in issues of conflict and dispute in UK construction (Allen 2013; Farah 2015; Rogers 2019); and equally the development of professional education and training for quantity surveying practitioners that enable these issues to be addressed professionally with competence, probity and altruism.

Chapter 8 presented descriptions of the research findings of this study in the form of text and visual tables and charts. The chapter introduced actual facts and data from the empirical fieldwork. Chapter 9 discussed the analysis of data collected and offered interpretations of what was discovered from the research techniques adopted. This chapter develops these findings and the subsequent discussions into conclusions and recommendations drawn from the theoretical constructs and the conceptual framework of the research when compared with the 'actuals' of reality. The chapter revisits the essence of the project explaining why the research topic was chosen and the intended outcome. Adopted research design is discussed and boundaries of the investigation reaffirmed. The body of the chapter provides macro answers to the research question and the final sections include recommendations that could be considered as a guide to improving the standard of professional practice of chartered quantity surveyors.

10.2. The purpose and intent of this research project

Standards of professional education and training for quantity surveyors are variables that impact upon the business efficacy of construction projects in the current UK built environment market. In that regard the standard of professional education has consequences for business, commerce and the wider public. This research investigates the level of professional competence and expertise needed to address current issues of practice encountered by quantity surveying practitioners against a rationale of increasing conflict and dispute in UK construction. The author's experience and reflection in practice conceptualised that this was a topic worthy of investigation and a subject that could generate new knowledge for the profession. The research aim is to answer the question as to whether education and training policies developed by RICS in preparing new practitioner members for the rigours of practice align with the disparate range and level of competencies required in the current UK built environment market. The intent of this research is to provide recommendations that could be considered as a guide to improving standards of professional practise for chartered quantity surveyors based on data gathered from empirical research methods.

10.3. Research boundaries

Whilst this research project has explored the wider aspects of professional education including the concept of professions, theories of knowledge, professional knowledge and professional knowledge acquisition, professional competence and the challenges faced by practitioners in the field; the research is clearly bound by functional borders that regulate its scope. UK construction and the UK built environment market establish boundaries for this research. RICS accredited degree courses are not evaluated for content or relevance and this chosen alliance by RICS with academia is not examined in detail. The empirical part of the project is confined to contributions from only chartered quantity surveyors working as 'front-line' practitioners in UK construction. Legal aspects of the research are founded in English law. Practice-based issues that challenge the competence of a chartered quantity

surveyor occur during the construction phase of a project. The construction phase of a project is defined as commencing with the procurement process and culminating with a final account. This research is focussed on the impact of the two year period of post-graduate professional education and training mandated by RICS policies that are conceived to prepare candidates for the Final Assessment Interview and the rigours of practice beyond.

10.4. Research Hypothesis

Current research literature confirms that conflict and dispute continues to be an increasing aspect of construction contracts in the current UK built environment market. The subject matter of conflict and dispute is identified by research literature to be predominantly concerning professional practice functions within the domain of quantity surveying. Reflection in practice and working assumptions made by the author from commissions in providing commercial support on a variety of construction projects suggests that occurrence of conflict and dispute in construction has a relationship with the levels of expertise and competence demonstrated by practising chartered quantity surveyors. The research explores this world view of reality and explains the nature of knowledge acquisition and the level of competency and practice standards for chartered quantity surveyors mandated by the profession's governing body RICS.

10.5. Theoretical constructs

Research in the field quantity surveying provides the theoretical foundation for this study commencing with the concept of professions and how their relationship with society has developed over time. The '*grand bargain*' and implied obligations and responsibilities that the professions have to their members, business, commerce and the wider public are seen to be diluted by self-interest and egotistical expansion at the expense of relevance. The theories of knowledge and expected levels of professional skill and expertise are explored

together with a definition of competence which is demonstrated as being linear and context specific. Quantity surveying as a profession is explained through its historical development and current policies of education and training implemented by RICS.

A critique of quantity surveying practice issues identified areas of practice performance that appear to be the cause of conflict and dispute on construction projects in the current UK built environment market. Specific aspects of professional knowledge and expertise that require awareness for competency in practice are explained as a measure of current RICS competency requirements including common doctrines of construction law. Current case law involving claims of negligence against quantity surveyors in practice are reviewed to demonstrate in reality serious issues of practice that the courts have been asked to resolve.

Current research literature is referenced in support of the research argument developed from the author's world view of quantity surveying practice. Research by others confirmed that levels of professional knowledge, expertise and competence fell short of what could reasonably be expected by industry, commerce and the wider public. Research literature identified a wide range of fundamental practice functions where chartered quantity surveyors have demonstrated low levels of expertise which have resulted in issues of conflict and dispute on construction projects in the UK built environment. These observations cited from research in the field serve to underpin the author's professional experiences and reflection in practice.

10.6. Research approach and techniques

An inductive approach has been used for this research in evaluating and understanding the relevance of current professional education and training for quantity surveyors. The paradigms of objectivism and subjectivism together with realism and constructionism all

contribute in part to meaning for this research. The conceptual framework is derived from current research literature, as previously explained in Section 10.5 and the author's world view from reflection in practice. The apparent lack of competence displayed by quantity surveying practitioners in dealing with practice-based issues experienced by the author led to the assumption that education and training policies created by RICS for chartered quantity surveyors did not necessarily address current issues being encountered in practice. Techniques adopted to explore this concept involved the use of mixed methods requiring the design and implementation of a self-administered online survey and semi-structured interviews with practising chartered quantity surveyors. These techniques established how professional education works in practise from the experiences of practitioners themselves.

10.7. Critique of the research

Undertaking this doctoral research project has been a journey of knowledge acquisition for the author. Developing an understanding of research language, research conventions and research techniques has been a consequence of the journey. Early planning stages of the research design did not fully benefit from knowledge gained later in the research process. With the benefit of hindsight design of the survey and the interview structure could have been more focussed in providing quite specific answers to the research question. Reflections from the interview experiences reminded the author of the need to keep the interview on track without being too prescriptive. Whilst the methodology and techniques were appropriate for the research aim and objectives, more thought could have been given to exactly what was the intended outcome for the research.

10.8. Resolving fieldwork problems

Initial considerations for the logistics and anticipated techniques necessary to conduct interviews with willing participants spread far and wide, centred upon the use of Skype. Early attempts to use the software proved to be unreliable after making precise

arrangements in time and date to conduct an interview. Face-to-face interviews were very rewarding but in the absence of Skype but were logistically not feasible with participants long distances away. Alternatively the author found that interviews conducted by speaker phone were sufficiently effective and equally rewarding.

10.9. Factual conclusions

10.9.1. Attainment levels

It is concluded from the evidence collected that attainment levels defined by RICS for competencies for Quantity Surveying and Construction APC Pathway have not changed since 2006.

10.9.2. Practise-based issues

It is concluded from the evidence collected that the nature of practice-based issues encountered by practising chartered quantity surveyors has a causal link with matters of conflict and dispute that occur on construction projects in the current UK built environment market. It is also concluded the magnitude of these matters of conflict and dispute have an inversely proportional relationship with levels of knowledge, skill, expertise and competence demonstrated by practising chartered quantity surveyors in the following quantity surveying functions:

- Quantification and costing of construction works
- Contract administration
- Ethics, Rules of Conduct and professionalism
- Diversity, inclusion and team working
- Client care
- Project financial control and reporting
- Contract practice
- Conflict avoidance, management and dispute resolution procedures

- Construction technology and environmental services
- Procurement and tendering
- Risk management
- Communication and negotiation
- Data management

It therefore follows from this conclusion that practising chartered quantity surveyors are not satisfied that they possess the necessary levels of knowledge, skill, expertise and competence to redress the balance of proportionality referred to in this conclusion.

10.9.3. Self-assessment issues

It is also concluded from the evidence collected that chartered quantity surveying practitioners self-assess themselves to be in need of greater levels of knowledge, skill, expertise and competence in the following RICS APC quantity surveying and construction competencies:

- Quantification and costing of construction works
- Contract administration
- Ethics, Rules of Conduct and professionalism
- Diversity, inclusion and team working
- Project financial control and reporting
- Contract practice
- Conflict avoidance, management and dispute resolution procedures
- Construction technology and environmental services
- Procurement and tendering
- Risk management
- Communication and negotiation
- Data management

10.9.4. Correlation of conclusions

The correlation of these two conclusions displays a commonality between competencies required by chartered quantity surveyors to address practice-based issues encountered in the reality of practice and quantity surveying functions where practitioners self-assess themselves to be in need of a greater level of knowledge, skill, expertise and competence, namely in the following competencies:

- Quantification and costing of construction works
- Contract administration
- Ethics, Rules of Conduct and professionalism
- Diversity, inclusion and team working
- Project financial control and reporting
- Conflict avoidance, management and dispute resolution procedures
- Construction technology and environmental services
- Communication and negotiation
- Data management

Quantification and costing of construction works; Ethics, Rules of conduct and professionalism; Project financial control and reporting; Contract practice; Construction technology and environmental services; Procurement and tendering are all APC mandatory core technical competencies required by RICS to be attained at Level 3. This level of attainment is defined generically by RICS as '*...providing advice*'. Despite completing the mandated two year period of structured training and being assessed in the Final Assessment interview to be competent to practice, practitioners themselves felt challenged in these areas of competency.

Contract administration and Risk management are technical optional competencies required by RICS to be attained at Level 2. This level of attainment is defined generically

'...application of knowledge'. It is concluded from the evidence collected that knowledge, skill, expertise and competence in these two fundamental quantity surveying functions should be mandatory and not be optional.

Diversity, inclusion and team working; Client care; Communication and negotiation; Data management are all mandatory competencies required by RICS to be attained at Levels 1 in some and 2 in others. Defined generically *'...demonstrate knowledge'* and *'...application of knowledge'*. It is concluded from the evidence collected that whilst these competencies are mandatory the acquisition of sufficient knowledge and expertise in soft skills from the unregulated period of structured training is questionable. The humanities and soft skills including relationship skills and particularly training for negotiation were identified as being insufficient by practitioners contributing to the empirical data.

Conflict avoidance, management and dispute resolution procedures is a mandatory competency for the RICS APC pathway of Quantity Surveying and Construction required to be attained at Level 1 defined *'...demonstrate knowledge'*. It is concluded from the evidence collected would tend to suggest that this important competency is not given a sufficient level of attainment at Level 1 in view of current trends evidenced in UK construction.

10.9.5. Period of structured training

It is concluded from the evidence collected that the quality of education and training available to a candidate during the two year period of structured training in preparation for the APC Final Assessment interview is dependent upon unregulated variables. The procedure relies on the level of knowledge, expertise and enthusiasm contributed by the candidate's counsellor and support and cooperation from the candidate's employer in providing the appropriate work experience. The existence of these these variables, it could be said, highlight evidential shortcomings which render the procedure arbitrary and unreliable.

10.9.6. APC Final Assessment interview time-line

It is concluded from the evidence collected that the RICS mandated time-line for an APC Final Assessment interview which allocates 26 minutes for two assessors to question a candidate on 18 competencies tends to suggest that the procedure is prohibitive for a realistic assessment of a candidate's competency. It is also suggested that the standard of assessing is an unregulated variable which is a subjective influence on the outcome of an arbitrary process. RICS randomly audit APC interviews but not for the standards assessment only for procedural compliance. These observations indicate that final assessment procedures may be open to a complete review and the adoption of other ways to determine a candidate's level of competency.

10.10. Secondary conclusions

A number of secondary conclusions emerged from the evidence collected and they are listed here in a brief summary:

- Basic academic levels of entry to the profession should be raised
- Ethical standards are not high enough
- Standards of professionalism are not high enough
- CPD requirements should be increased
- Structured mentoring post chartered membership should be introduced
- Members should be professionally audited for the first five years of practice post chartered membership

10.11. Conceptual conclusions

The concept of professions referenced in the early sections of the literature review was explained from their origins and early ethos. The '*grand bargain*' paints a picture of a mutually beneficial arrangement between the professions and society however later developments exposed characteristics of self-interest and privilege at the expense of members and society. RICS refers to itself as business and not a members' organisation which defines its current ethos but at the same time this cannot detract from its responsibilities emanating from a royal charter status.

Professional knowledge and competence in its various forms is essentially about 'know how' and the ability to apply knowledge in carrying out a task competently. Competence has a linear definition which is context specific and these concepts must be clearly appreciated in the governance of policies and procedures for professional education and training. Policies and procedures must be cognisant of current developments in practice and industry customs and technology. The status of a professional is defined as one who has acquired specialist knowledge and expertise. The extent to which this knowledge and expertise extends is governed by the needs of business, commerce and the wider society.

Research literature identified shortcomings in quantity surveying practice which have resulted in issues of conflict and dispute. These observations align with the author's own experience and reflection in practise. Current literature is quite clear regarding the quantity surveying functions that are sensitive to the rigours of current practice and these functions occur as a thread throughout this doctoral research. Included as research references current case law involving claims of negligence against chartered quantity surveyors provide vigorous examples of poor practice standards that are not theories emerging from research but are the realities of consequences from poor practice.

The professions have an important role to play in the current UK built environment market but they must remain relevant and current in maintaining high levels of expertise. The author has seen the decline of the quantity surveying profession as it continues to play a support role for the contract consultant, the claims surveyor and the claims consultant all of which benefit from the current industry default to engage an expert. Most construction disputes involve quantum and construction law. Higher levels of knowledge, expertise and competence in the fundamental quantity surveying functions enables practitioners to address practice issues correctly and competently and as such are able to credibly justify their professional approach in the face of a challenge to their competence. The author is proud to be a chartered quantity surveyor and has continued to support the policies and governance of RICS through over 20 continuous years of APC assessing and time spent as an elected member of the global governing council. Acting as counsellor for 20 undergraduate apprentices the author provides guidance and mentoring in preparation for their APC Final Assessment interview. One of the objectives of this research is to develop recommendations for RICS professional education and training for quantity surveyors; recommendations that could be considered as a guide to improving standards of professional practice.

10.12. Research question answered

This doctoral research project has evaluated professional education and training policies mandated by RICS and has established the extent to which it equips the chartered quantity surveying practitioner to deal with current issues encountered during the construction phase of projects in the current UK built environment market. The evaluation involved an appraisal of the professions, professional knowledge and the concept of competence (Research Objective 1.). The identification of practice-based issues faced by chartered quantity surveying practitioners (Research Objective 2.) and the nature and extent of professional education and training received by practitioners in relation to these issues of practice (Research Objective 3.). The research engaged with practitioners and established their perspective and experience of the practical utility of current professional education

and training in relation to the issues of current practice realities, evidence of the scale of the everyday (Research Objective 4.). This doctoral research concludes with suggested recommendations developed from the research procedures and data gathered in support of the research argument. The recommendations could be considered as a guide to improving professional practice for chartered quantity surveyors (Research Objective 5.).

10.13. Contribution to knowledge

Current research literature provides a curriculum of professional knowledge and expertise that is believed quantity surveying practitioners should have acquired to practise competently, as proposed by Nkado and Meyer (2001); Christabel and Vincent (2003); Ashworth and Hogg (2008); Coleman (2010); Buchanan (2012); Ashworth (2013) and Lee (2014). Existing research refers to keeping pace with current developments, trends and practices in industry, commerce and technology and the need to be relevant. Other research explores the means by which the professional competency of practising quantity surveyors can be assessed Barrett (1992); Dada (2012); Dada (2016) and Dada (2018). Therefore this body of current literature provides an inventory of what knowledge and expertise a quantity surveyor should have acquired to practise competently and a methodology that can be used to test that competency. As such current research literature is considered by the author to be normative, it does not engage with the realities of practise or the individual practitioner experience. In essence existing research does not establish how professional education and training for chartered quantity surveyors actually works in practice.

This doctoral research project has explored the concept of professions, professional knowledge, professional competence, the profession of quantity surveying and the status quo of professional education and training for chartered quantity surveyor. Data for this research has been gathered by engaging with practitioners to understand and interpret their experiences and challenges faced in the reality of practice scenarios. Current research

Jahren and Dammeier (1990); Love et al (2009); Allen (2013); Genton (2014); Farah (2015); Ansell and McCafferty (2017); Milligan and Catternach (2018); Kitt (2018); NBS (2018) and Rogers (2019) have examined the occurrence of conflict and dispute in construction and adopted a variety of techniques to explain the reason for this increasing problem for public and private finance. Whilst referring to relevance of professional education current research has not engaged with practising professionals to understand the extent to which current professional education for quantity surveyors is relevant for current issues of practice encountered 'out there' in the field. This research has engaged with practitioners using a survey and interview mixed method technique which has provided evidence for the scale of individual experience from a rich data set that places current professional education and training for quantity surveyors in the reality of practise issues.

10.14. Agenda for further research

The construction industry still relies heavily on traditional craft skills but at the same time is faced with developing digital tools including Building Information Modelling (BIM), digital construction techniques and artificial intelligence. The project team is becoming the centre of expertise and the principle driver in developing and implementing a construction project. This evolution prompts the following questions as subjects for future research:

Training methodology for the development of soft skills in quantity surveying practice.

Why structured mentoring is an essential aspect of professional development for chartered quantity surveyors.

The importance of measurement skills in current quantity surveying practice.

What is the future role of the quantity surveying professions in the UK construction process?

10.15. Introducing recommendations

It was always the intention of the author to provide recommendations that could be considered as a guide to improving professional practice and levels of skill, expertise and competence for practitioners and the profession of quantity surveying. The research revealed a number of sensitive areas of professional education and training for quantity surveyors and these form the basis of recommendations that are briefly explained in the following sections.

10.16.. Academic entry levels

Current research literature places surveying in the category of a 'true' profession. Academic entry levels could be raised in line with medicine, architecture and law.

10.17. Sensitive quantity surveying functions

Measurement, construction technology, contract practice, project finance and reporting, procurement and tendering, ethics, rules of conduct and professionalism are all sensitive in terms of competency levels. These subjects should be prioritised in the curriculum of professional education and training for quantity surveyors.

10.18. New subject focus

Construction law should be introduced as another curriculum priority.

10.19. Soft skills

The humanities, relationship skills, team working, communication, negotiations skills are all essential competencies for quantity surveying practitioners in the current UK construction market. Their importance should be elevated and consolidated into competency requirement.

10.20. Increase attainment levels

Contract administration and risk management should become mandatory competencies in the APC curriculum.

10.21. Structured mentoring

Mentoring was recognised by practitioners to be an important aspect of professional development. It should become a mandatory function of life-long learning.

10.22. Increased CPD requirements

The mandatory CPD requirements should be increased in line with other 'true' professions.

10.23. Review the APC process

The APC process including the two year structured training requirement and the APC Final Assessment interview should be the subject of an in-depth review which addressed aspects of regulation; the acquisition of knowledge, expertise and skills; accurate and realistic assessment of competence; relevance; and currency.

10.24. Professional standards at the expense of revenue

Practitioners detect a 'dumbing down' of the quantity surveying profession through policies that pursue at the expense of professional standards. High professional standards are the future of the profession. This ethos should be a priority.

10.25. Closing comments

This doctoral research project has demonstrated a link between the occurrence of matters of conflict and dispute on construction projects and problems of practice demonstrated by chartered quantity surveying practitioners. Empirical data gathered for this research established that there is a link therefore between quantity surveying functions that practitioners self-assess themselves to have lower levels of competence; and the identified problems of practice that cause conflict and dispute. The research has also made a

connection between lower levels of competence and aspects of professional education and training for quantity surveyors mandated by policies and procedures implemented by RICS. The research has demonstrated that a review by RICS of current policies and procedures that mandate professional education and training for quantity surveyors, it could be said, would benefit the development and status of the profession of quantity surveying for the future. The research includes recommendations that have developed from reflection in practice and evidence gathered from the research process. Collectively they reflect a proposed range of changes that could improve education and training for chartered quantity surveyors and the future status of the quantity surveying profession.

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APPENDICES

Appendix 1. Online Survey

QS education and practice

Page 1: Page 1

RICS professional education and training for quantity surveyors and its fitness for purpose in the current built environment market

This research project evaluates professional education and training for quantity surveyors sponsored, designed, administered and regulated by the RICS. The research asks whether being afforded the title of chartered quantity surveyor equips the practitioner to deal with practice based issues currently encountered during the construction phase of projects in the built environment. Data for the research is required from quantity surveying practitioners who have achieved the designation of 'chartered' and therefore deemed competent to practice by the RICS

It is not anticipated that you will be exposed to any risk by filling in this questionnaire; you will only be asked to provide basic demographic information, and information about your professional education and practice.

You are not obliged to take part in the project. If you later decide you wish to withdraw from the study please simply notify the researcher and to the extent that the data you have provided does not already form part of submitted or published work, all data you have provided will be destroyed and removed from any work in progress.

By completing the questionnaire you are deemed to give consent for the data to be used for the purpose of doctoral research.

Data will be stored in an encrypted file and destroyed a maximum of three years after completion of the doctoral process (by award or otherwise).

Appendix 2. Interview Guide

University of Salford, Manchester.

School of the Built Environment

Doctorate in the Built Environment

Doctoral Research

RICS professional education and training for quantity surveyors and its fitness for purpose in the current built environment market.

The following guidance notes are provided to assist potential participants to better understand the structure and nature of the proposed interview.

This research project evaluates professional education and training for quantity surveyors sponsored, designed, administered and regulated by the RICS. The research asks whether being afforded the title of chartered quantity surveyor equips the practitioner to deal with practice-based issues currently encountered during the construction phase of projects in the built environment. Data for the research is required from quantity surveying practitioners who have achieved the designation of 'chartered' and therefore deemed competent to practice by the RICS.

It is not anticipated that you will be exposed to any risk by agreeing to participate in this interview; you will only be asked to provide basic demographic information, and information about your professional education and your professional practice.

By agreeing to participate in the interview you are deemed to give consent for the data to be used for the purpose of doctoral research. An audio recording will be made of the interview and a text transcription made for analysis. A copy of the transcription will be provided for your approval and comment before any analysis is made.

You are not obliged to take part in the project. If you later decide you wish to withdraw from the study please simply notify the researcher and to the extent that the data you have provided does not already form part of a submitted or published work, all data you have provided will be destroyed and removed from any work in progress.

Your contribution will be strictly confidential and **anonymous**, identified only by a serial number. Data will be stored in an encrypted file and destroyed a maximum of three years after completion of this doctoral process (by award or otherwise).

Section 1. - Introduction

Time:	
Date :	
Method:	
Interviewer:	
Interview Serial Number:	
General Instructions and Approvals:	

Section 2. – Subject areas and draft questions

Work experience

These questions are designed to explore the nature and status of your employment and the type of work experience you can demonstrate.

1. What is the nature of your employer organisation?
2. What is your job title?
3. What is your role and what are your responsibilities?
4. What type of projects do you manage?
5. What is the value range of these projects?

Professional education and professional practice

These questions are designed to understand your experience of professional education and training together with your appraisal of how relevant it was for you in dealing with practice-based issues encountered as a practitioner.

1. To what extent did the knowledge you obtained from your degree level education prepare you for the RICS professional quantity surveying pathway?
2. Please explain how relevant RICS professional education and training for quantity surveyors has been for you in dealing with the demands of practice?
3. What aspects of professional practice do you find most challenging and why?
4. Have you had experience of dealing with conflict and dispute during the construction phase of projects in your area of practice, if so, how have you administered these issues?
5. Please explain how important senior colleagues have been in helping you to acquire professional knowledge and expertise.
6. How important to you is professional life-long learning and continuing professional development?
7. How would you rank the importance of high standards of professional ethics and conduct in the current built environment market?
8. Do you think that RICS professional education and training for quantity surveyors could be improved, if so, how?

Section 3. – Closing comments

Interviewee's Closing Comments:	
Interviewer's Closing Comments:	
Thanks to the Participant:	

Interview Guide - Version 3. – August 2018

Appendix 3. Ethical Approval



University of
Salford
MANCHESTER

Research, Innovation and Academic
Engagement Ethical Approval Panel

Research Centres Support Team
G0.3 Joule House
University of Salford
M5 4WT

T +44(0)161 295 5278

www.salford.ac.uk/

27 April 2017

Stephen Moore

Dear Stephen,

RE: ETHICS APPLICATION ST1617-67 - Beyond the ideal: professional knowledge and professional practice in quantity surveying

Based on the information you provided, I am pleased to inform you that your application ST1617-67 has been approved.

If there are any changes to the project and/ or its methodology, please inform the Panel as soon as possible by contacting S&T-ResearchEthics@salford.ac.uk

Yours sincerely,

Anthony Higham

