University of Reading

The Investigation of the Interplay between Professional Identity and Attitudes towards Sustainability for more Sustainability Practices in the Built Environment Sector

Thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy at the

School of Construction Management and Engineering

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Dedication

For

My dad, Mohd Hafir bin Mansor

My mum, Zailah binti Nyan

My family

Abstract

This research aims to gain a better understanding of, and probe the interplay between, the emergence of professional identity (PI) and attitudes towards sustainability of current and future built environment (BE) professionals based on their educational and practice/work experience. The emphasis of the research is on the quantity surveying (QSing) profession. The reason is that the profession plays an essential role as part of the design team. Therefore, the profession has the potential to impact on sustainability. However, there is less research on the QSing profession around sustainability compared to other professions like architects and engineers (Elforgani and Rahmat, 2010).

Moreover, there is also not enough evidence to suggest that quantity surveyors (QSs) are actively involved with sustainability (Ma and Luu, 2013). In these regards, this study uses a research framework to interrogate the tensions that exist in the enactment of sustainability by QS professionals; between the views of the greater good (sustainability) and the short-term needs of professionals (e.g. to win work, to satisfy client). Also to probe how the tensions play across various snapshots in the journey starting from as an individual come into the formal professional education to the point where they are practising as a chartered professional.

The emergence and interplay are explored through qualitative cross-sectional research based on semi-structured interviews from four categories of participants with ten participants in each category. The participants are QS students (new and final year students), graduates from the University of Reading and chartered quantity surveyors (CQSs) from the southeast of England. The work examines experiences of the complex construct of PI and attitudes towards sustainability with the emphasis being on how current and future professionals perceive and interpret the two concepts that could lead towards more sustainability practices.

The research identified that PI is forming and developing as an individual gained more knowledge, skills and experience with one's profession. Individuals thus are aware of their roles and responsibilities (including sustainability) as professionals. However, the enactment of their professionalism is more towards fulfilling the client's requirements, i.e. fulfilling obligations that could be considered as opting for the short-term perspective as opposed to the long-term benefits of sustainability. From the data, what are lacking in their current practices are the essential values of a profession particularly concerning a belief in public service (the benefits of sustainability to the wider society). This outcome thus suggests that the profession, professional body and professional educational institution re-evaluate their approaches to reflect and instil the essential values of a profession and develop a strong moral agent for change for, and champion of sustainability.

Keywords: built environment, professional identity, quantity surveying, sustainability, sustainability practice

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Declaration

I confirm that this is my own work and the use of all material from other sources has been properly and fully acknowledged.

Nurulaini Hafizah Binti Mohd Hafir

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Abbreviations

APC	Assessment of Professional Competence
BE	Built Environment
BIM	Building Information Modelling
BREEAM	Building Research Establishment's Environmental Assessment Method
CIBSE	Chartered Institution of Services Engineers
CIOB	Chartered Institute of Building
CPD	Continuing Professional Development
CQS	Chartered Quantity Surveyor
DESD	Decade of Education for Sustainable Development
ESD	Education for Sustainable Development
FYS	Final Year Student
HE	Higher Education
HEI	Higher Education Institution
ICE	Institute of Civil Engineers
LCC	Life Cycle Costing
NP	Novice Practitioner
NS	New Student
PI	Professional Identity
QS	Quantity Surveyor
RIBA	Royal Institution of British Architects
RICS	Royal Institution of Chartered Surveyors
UN	United Nations

Chapter 1: Introduction

1.1 Background to the Research

In recent years, increasing attention has been given to the issue of sustainability. According to the World Economic Forum (2016), climate change is one of the ten most significant global challenges. Growing concerns towards sustainability led leaders of the world to come together in the 1992 Rio Earth Summit to discuss ways of achieving sustainability by setting out 27 principles and agreed on an action plan called Agenda 21 (du Plessis, 2002). Part of the agenda was for all countries, particularly governments, to develop national sustainability strategies. The participating governments also approved an addition to the agreement which is known as the Kyoto Protocol in 1997 (UNESCO, 2006). It is an agreement made under the United Nations Framework Convention on Climate Change to reduce global warming. Therefore, in 1999, the targets set for the reduction of greenhouse gas emissions were agreed worldwide. The target for the European Union, in particular, was to reduce emissions, to 8 percent below 1990's levels, by 2008-2012 (SCTG, 2004).

Since the Rio Earth Summit and the Kyoto Protocol, there has been a worldwide debate on how to reinforce responsibility towards sustainability. Some of the discussions revolve around people, calling for a wholesale change in behaviour (Pooley, 2016), and focusing on the educational sector in general (Huckle, 1993; Sterling, 2001). Other discussions revolve around the specific role of professional education in creating awareness and its ability to drive the sustainability agenda forward (Buckler and Creech, 2014; Hayles and Holdsworth, 2008; Tilbury, 2007).

Despite considerable attention focused on policy and some advances made towards reinforcing sustainability, the built environment (BE) sector remains a significant contributor to environmental degradation and its progress towards embracing and engaging with the concept of sustainability is relatively slow (du Plessis and Cole, 2011; Hartenberger et al., 2013; Inkoom and Leiringer, 2016). According to these scholars, this is due to the complex nature of the construction industry, a lack of collective responsibility and the fact that sustainability does not resonate with the industry's professionals - to name just a few reasons. A study by Maduka et al. (2016) revealed that the promotion of sustainability by key stakeholders in the construction industry is not a priority.

However, approaches to understanding sustainability and how to address the related issues have been made through education and training (Gadotti, 2008; Sterling, 2001), technical development (Dewick and Miozzo, 2002; Glass et al., 2008) and regulatory and organisational change (Akadiri and Fadiya, 2013; Opoku and Ahmed, 2014). In particular, in education, many initiatives and approaches have been adopted and deployed in response to the issue of sustainability (Cowling et al., 2007; Hayles and Holdsworth, 2008). Given the focus on sustainability in the BE professional educational programmes, the question thus arises as to why BE professionals are not perceived to be impacting the sustainability agenda.

1.2 Rationale for doing the Research

BE professionals play a key role in efforts to foster sustainability within the sector (Ballard, 2008). Part of the reason for the slow progress in achieving better sustainability within the BE sector, is attributed by some, to the lack of engagement by the professionals. The quantity surveyor (QS) in particular has the potential to create impact, but there is less research around the QS's role in comparison to architects or engineers (Chong et al., 2009; Elforgani and

Rahmat, 2010). One also needs to question the role played by other professionals within the design team as one of the main barriers to sustainability implementation is the increased capital cost (Zhou and Lowe, 2003). QSs have an impact on the overall economic viability of constructed items (Ofori and Toor, 2012). However, there is not enough evidence to suggest that QSs are actively involved in sustainability efforts (Ma and Luu, 2013). The authors also asserted that the QSs are just continuing to do what they always do in terms of service provisions, i.e. business as usual. If this is the case, what can the quantity surveying (QSing) profession do to contribute to society, particularly in regard to sustainability?

As an issue related to professional training and practice, mobilising the concepts from the studies of professionalism or the sociology of professions to examine the issue of sustainability in the context of QSing profession is appropriate. The history of professions, in general, tells us that a significant factor in their establishment is to entail services for the common good (Cruess et al., 2000). According to Greenwood (1957: p.71), foremost among a profession's social values is "the essential worth of the service which the professional group extends to the community". In this regard, professionals today have an essential role to play in relation to the issues of sustainability. The enactment of a professional role, as asserted by Ibarra (1999), is associated with professional identity (PI). Furthermore, according to Trede et al. (2012), PI is a concept that refers to a self-conception of what it means to be, and act as a professional. Thus, the PI concept has a direct linkage to the professionals' everyday practices (Fagermoen, 1997) and it involves the internalisation of the profession's values and norms as part of an individual's behaviour and self-concept (Adams et al., 2006).

In this instance, a recognised PI for the BE professionals has the potential to gradually move the BE sector towards more sustainability practices. Professionals, with their esoteric knowledge and skills, and a sense of responsibility to serve the public, can have a significant

influence on the people around them and society at large. It is these reasons that motivated this study to look into the concept of PI in QSs in relation to the attitudes towards sustainability.

1.3 Research Aim and Objectives

This research aims to gain a better understanding of the interplay between the emergence of PI and attitudes towards sustainability of the current and future BE professionals based on their educational and practice or work experience. This study did not concern itself with measuring, establishing or assessing the outcomes of a particular curriculum or a specific construction project but interrogates the motivations, experiences and viewpoints of individuals to gain a more profound sense of how their PI relates to attitudes towards sustainability because this could contribute towards the change for better sustainability practices. In order to examine the interplay between the two concepts, the research first explores their formation and development. Therefore, the three main research objectives are as follow:

i. To explore the formation and development of PI in the current and future QSs,

   - From professional education and practice or work experience
   - Perceptions of PI
   - Influencing factors

ii. To explore the formation and development of attitudes towards sustainability,

   - From professional education and practice or work experience
   - Perceptions of sustainability
   - Influencing factors

iii. To investigate the existence of the interplay, if any, between emerging PI and attitudes towards sustainability.

The research begins with a comprehensive review of the relevant literature in order to identify the knowledge gap pertaining to the problem statement. The review included the concepts related to sustainability and PI in general and within the BE sector. Semi-structured interviews were used to achieve the three research objectives sequentially. A detailed account of the research methodology is provided in Chapter 3.

1.4 Significance of the Research

Understanding how emerging PI relates to sustainability practices is essential to the BE sector as well as to educationalists, and those want to promote sustainability practices. It has been identified that PI is integral to a profession, yet the concept is under development within the BE sector. This study will highlight the professionals' perceptions of their roles and responsibilities and how this understanding translates into their collective identity. As asserted by Hartenberger et al. (2013), a shared PI could support the definition of a shared goal (i.e. collective responsibility for sustainability). Therefore, PI on an individual level needs to be more fully understood before accurate collective identities can be established. Understanding the formation and development of PI is essential. It would help build a better understanding of what factors influence the emergence of PI in relation to the attitudes towards sustainability and what strategies and actions are needed to achieve sustainability that could lead to transformative changes as standards of good practice. This outcome would consequently uphold the essential values of the BE-related professions in the eyes of the public, i.e. a sense of responsibility for, and commitment to the social good.

In addition, the current study is the first to investigate a cross-sectional emergence of PI in relation to the attitudes towards sustainability in different contexts and experience levels. As PI is under developed within the BE sector, more information is needed to improve the definition and understand how PI develops and changes and how it intensifies sustainability practices. The proposed research will add to the literature by investigating the PI development of students who are newly enrolled in professional education through to experienced professionals. The information will be meaningful to:

- Educators in determining the curriculum design and implementation,
- Employers in formulating hiring, support practices, and professional development,
- Professional body in the development of professional profiles and accreditation criteria and standards.

1.5 Overview of the Thesis

The thesis comprises seven chapters:

Following this chapter is Chapter 2, which provides an insight into the existing literature related to the research topic. The chapter reviews the literature relevant to the concepts of sustainability and PI in general and their applications within the BE field and addresses the inter-relationship between the two concepts. This chapter also examines the QSing profession (including the governing body) as it is the focus of this research and the fact that the profession plays a key role in the construction projects. The chapter argues that there is insufficient research that directly studies the QSs' PI. Moreover, there is also limited evidence about the profession's active involvement in the issues of sustainability. These are the motivations behind the research in order to focus on the QSing profession and how PI could help to ensure increased sustainability practices.

Chapter 3 presents the research methodology. A qualitative method was used in order to achieve the research objectives better. The chapter describes both the development of the research design, comprising interviews with the cohorts of current and future QSs at four different snapshots, and the data analyse using the thematic analysis. The results from the research are divided into three chapters based on the research objectives in order to facilitate discussion.

Chapter 4 presents the findings and discussion of the formation and development of PI. It argues that PI started to develop even before formal professional education and strengthens as individuals gain more understanding, skills and experience (through formal professional education and practice or work) about their profession. The chapter also discusses how participants describe and characterise their PI, changes in the PI descriptions as it emerges, and the influential factors identified in the process of PI formation and development.

Chapter 5 is the second chapter of the research results that presents the findings and discussion regarding the formation and development of attitudes towards sustainability. The chapter examines how the new students gained understanding about sustainability prior to their formal professional education and how the educational programmes and practice or work engage with sustainability. The discussion also includes the participants' perceptions of the profession's roles and responsibilities regarding sustainability, their professional body's sustainability projection and promotion, and identification of factors that influence the emergence of attitudes towards sustainability.

Chapter 6 draws together the specific outcomes from the preceding chapters (Chapter 4 and 5) and expands the central focus of the research which aims to examine the interplay between PI and attitudes towards sustainability. The chapter discusses tensions that exist between the views

about the greater good and short-term gains and how they play out across different snapshots of the journey.

Chapter 7 presents a conclusion of the research highlighting how enthusiasm towards sustainability during or from education could end up as just doing the job and fulfilling obligations during practice or work stage. There are several reasons identified that contributed toward this circumstance, and some of them are that the QSs somewhat depend on others (e.g. architects or designers and clients) to be innovative and to adopt sustainability in a project, and the lack of belief in service to the public at large or greater good. Although this research is limited to particular contexts, it is recommended the extension of the themes raised in this thesis to be explored in an effort to develop a more comprehensive understanding on the development of PI in relation to attitudes towards sustainability. Such expansion of knowledge will consequently contribute to sustainability practices within the BE sector.

1.6 Summary

In summary, this chapter describes the context of the research in exploring the emergence of PI in relation to the attitudes towards sustainability and probes the interplay between the two. It describes the background context for the research, highlighting the importance of sustainability and why the BE sector is still slow to progress towards it. The chapter describes how, despite the commitment of the educational sector and the BE industry, sustainability is still not widely integrated into everyday practices of the professionals. This issue has led to the questioning of the essential elements of professions; where one of the elements is a sense of responsibility to serve the public. The exploration of the sociology of a profession thus leads us to the concept of PI; a sense of being a professional reflected by one's commitment and attitude towards his or her profession. The research aims and objectives were then formalised to set the direction of

the study. The information gained would be beneficial to the BE professions, educationalists and those wanting to promote sustainability practices. The chapter ends with the structure and outline of the thesis.

Chapter 2: Literature Review

2.1 Introduction

This chapter begins with the reviews of the literature relevant to sustainability and professional identity (PI), including the education and practice of both variables in relation to the BE sector and its professionals. The chapter examines how the formation and development of PI can contribute towards sustainability. The chapter also provides a review of the quantity surveying profession and professionals of how this discipline can potentially help to increase sustainability practices in the BE sector as this discipline is the focus of the current research. The final part of the chapter explains the development of the research questions that form the foundation of the research as an empirical investigation.

2.2 Sustainability and the Built Environment Sector

2.2.1 Defining Sustainability

Sustainability according to Cambridge Dictionary (2017) is "the quality of being able to continue over a period of time". Within the dictionary, under Business English, sustainability is defined as "the idea that goods and services should be produced in ways that do not use resources that cannot be replaced and that do not damage the environment". The most common definition existed in the literature is the one in the Brundtland Report. Since the definition, there have been hundreds of variations of definition in the literature available to date (Johnston et al., 2007; White 2013). Variations in the definition occur as some of the definitions existed has been through modifications and reformulation in accordance to various contexts and viewpoints. Different world views opined by Steen and Palander (2016) are likely to result in different definitions of sustainability.

Sustainability concept may have different meaning depending on the analysed literature in which it is used (Ciegis et al., 2009), and it applies to many social and ecological situations. Some referred to the "three pillars of sustainability" provided in the Brundtland's report, which included aspects of the economy, social and environment (United Nations, 1987). DesJardins (2016) stated that the concept encompasses these three pillars: economics, environment and ethics. John and Narayanamurthy (2015) proposed four dimensions, namely economic, environmental, ethical and social dimensions. The concept of sustainability proposed by Pierantoni (2004) was nevertheless difficult to understand. This is probably why a number of literature related to sustainability did not provide a well-defined description of the concept. Moore et al. (2017) claimed that among the 209 articles on sustainability, only 24 articles included a definition of sustainability. This lack of clarity and agreement are probably due to the difficulty in selecting or constructing a suitable definition.

With diversified interpretation and opinions, the precise and shared definition might be unfeasible as not everyone views could be encompassed in that definition. Therefore, there might be some advantages to having an open meaning of sustainability, which is open for constructive development of the concept. Moreover, the concept itself is evolving. However, Moore et al. (2017) indicated that due to the lack of consistent definitions, it poses quite a challenge to conduct research on sustainability. Inconsistency, as postulated by the authors, resulted in an uncertainty of how researchers measure and operationalise sustainability. As opined by Ciegis et al. (2009), the ambiguity of the definition that allows the usage of the term or phrase might lead to a diminished essence in the overall goal of achieving sustainability.

The BE sector is also finding it a real challenge to construct its own shared agreement on the definition (Chong et al., 2009; Tabassi et al., 2016). Some of the definitions are specific to the construction industry and used the term 'sustainable construction'. For example, sustainable

construction is defined by Kibert (2007: p.595) as "how the construction industry together with its product the 'built environment', among many sectors of the economy and human activity, can contribute to the sustainability of the earth including its human and non-human inhabitants". Sustainable construction, as asserted by Liu et al. (2012) is the application of sustainable development principles in the construction industry. It concerns the implementation of sustainable development in all phases of the building process (Tan et al., 2011) and life cycle (Yilmaz & Bakis, 2015). Sustainable construction is therefore, a context-specific term (within the construction industry) that aims to move towards achieving sustainability or sustainable development.

Other scholars within the BE sector also provided definition on sustainability and sustainable development. Robinson et al. (2006: p.795) for instance defined sustainability in the context of construction as "a need to be involved in environmentally, socially acceptable and ethically sound projects, using processes that enhances regulatory compliance, minimizes waste, rework, defects and pollution, and delivered by people trained in sustainability and working within a safe environment". Brandon and Lombardi (2011: p.21) on the other hand defined sustainable development is "a process that aims to provide a physical, social and psychological environment in which the behaviour of human beings is harmoniously adjusted to address the integration with, and dependency on nature in order to improve, and not to impact adversely, on present or future generations". Sustainability or sustainable development is often discussed in terms of balancing the three pillars model proposed by the United Nation (White, 2013). Those three pillars aim at seeking a balance between environmental responsibility, social awareness and economic profitability.

From the literature search, there are various definitions of sustainability or sustainable development existed within the BE sustainability-related literature. To date, the BE sector has not yet established its shared agreement of the definition as each discipline as stated by Ganah et al. (2008) has developed its own definition, agenda and objectives to achieve sustainability. The two terms of sustainability and sustainable development are conveying different meanings to different people. For this research, the researcher uses the term "sustainability" throughout the study. Undoubtedly, sustainability is a noble virtue which everyone is perceived to be looking to achieve, although there are different opinions and definitions. However, in establishing the basis for clarity and scope of the study, the definition from the Brundtland Report is adopted:

> "Meeting the needs of the present without compromising the ability of future generations to meet their own needs [...] A process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations (Brundtland, 1987: p.43).

This Brundtland definition is not only widely accepted as a basis for definition of sustainability (Warren-Myers and Reed, 2010) but also commonly cited within the BE sustainability-related literature as well. Moreover, a study by Abrahams (2017) showed that the sustainability definition from the Brundtland Report has influenced the way professional actors from the construction industry define the concept. Data from the study also suggest that these definitions resonate most strongly with actors working in design-based roles or roles in the construction process with a strong relationship with the design process (Abrahams, 2017). Holdsworth (2010) also obtained a similar finding where all faculty members and many graduates used the Brundtland definition when they were asked to define sustainability.

The definition has deeply embedded in development policies across the globe (Carter and Fortune, 2008). The definition is in fact, a specific turn-point from the previously dominating attitude regarding "growth or environment" (a contradiction between the two). It is moving towards a possibility of mutual interaction between economic growth (development) and the environment (ecological sustainability) which is the philosophy and the essential contribution of the Brundtland Report (Ciegis et al., 2009; Jabareen, 2012). Brundtland calls for a different form of growth; "changing the quality of growth, meeting essential needs, merging environment and economics in decision making" (Brundtland, 1987: p.49) with an emphasis on human development, participation in decisions and equity in benefits (Hopwood et al., 2005). The definition posits that the only truly sustainable form of progress is that which simultaneously addresses the interlinked aspects of the economy, environment and social well-being (the three pillars of sustainability) (Johnston et al., 2007).

The Economic Element The Brundtland Report called for a new model of economic development because the present economic growth model disregard for environmental factors (DesJardins, 2016). The present economic growth as stated by (DesJardins, 2016) was jeopardizing its ability to meet human needs, both in the present and future. Sustainability as assert by Eichholtz et al. (2010) have the ability to increase the quality of life over a period of time. This aptitude can lead to an incomes improvement, healthier lifestyle and wellbeing, education opportunity and enhancing the value of natural and built environments. As cited in Chan (2009), this is further enhanced from the benefits of more efficient use of resources.

The Environmental Element Environmental sustainability includes efforts to conserve and reuse (Rusinko, 2010) and comprises all natural capital that can be subdivided into stocks of renewable and non-renewable resources (Keiner, 2005). The environmental sustainability deals with recognising the limits of the natural environment and the need to lessen resource

consumption in order to maintain a healthy state (Vanegas, 2003). It is the planet-wide interconnections where environmental problems are not just local but also global. Therefore, in order to avoid displacement of problems from one area to another (e.g. pollutions and using more than an equitable share of the earth resources) actions and impacts have to be considered internationally (Hopwood et al., 2005).

The Social Element Social sustainability includes efforts to promote equity, diversity, and social justice (Rusinko, 2010). The development proposed is a means to eradicate poverty, meet human needs and ensure that all get a fair share of resources (Hopwood et al., 2005). Social sustainability, as argued by Hill and Bowen (1997) is one of the most challenging aspects to define. They, however, suggest that the aspect is looking at improving the quality of life. Adetunji et al. (2003) posit that this aspect deals with moral, legal and ethical obligations. As cited in Valdes-Vasquez and Klotz (2013), this aspect is fundamentally about people; improving social health, well-being and safety, and considering both the current and future needs.

The three pillars of sustainability are not mutually exclusive and can be mutually reinforcing. The three pillars are interdependent, and in the long run, none can exist without the others. Sustainable development promotes the concept of reconciling economic and social progress without jeopardizing the natural balance of the planet (Cioruta et al., 2018). Balancing these three pillars is essential to ensure that everyone (both the current and future generations) can enjoy the benefit of being sustainable (ZainulAbidin, 2010).

Following subsections explore in details the aspects of sustainability in relation to the BE sector.

2.2.2 Impacts of Sustainability

Apart from being one of the largest sectors and a vital component of the economy, BE is also one of the most significant contributors to greenhouse gas emissions, a waste creator and its activities affecting water resources (Hill and Bowen, 1997, Shelbourn et al., 2006; Yusof et al., 2016). The impact from the BE sector is not just on the natural environment but also on the economic and social aspects as well (Petri et al., 2014). The BE sector involves the creation of much of the world's human-made capital. It is one of the largest exploiters of natural resources, and its activities cause irreversible transformations of the natural environment (Spence and Mulligan, 1995). Construction projects according to Yip (2000) have increasingly impacted directly on the environment with air, noise, dust pollution, and contaminated water. The construction activities contributed to air pollution through the production processes of building materials and from site activities. The impacts are not just on the environment but the people as well those who live in the surrounding area. Airborne pollution has led to discomfort, sore eyes and throats, headaches, nausea, fatigue and even illness (Ofori, 1992).

Some other construction activities also contributed to the loss of soil and agricultural land in several ways (mining and quarrying for raw materials, agricultural land converted for urbanisation and for infrastructures to name a few). The conversion to other uses has also contributed to the loss of forests as well, through the unsustainable use of forest resources such as timber and bamboo that are being used for building materials. As they play an essential part in the planetary carbon cycle and biodiversity, the loss of forests is a matter of particular concern. The construction industry is also a significant user of the world's non-renewable energy sources and materials such as fossil fuel and metals like copper and zinc (Shaaban, 2016).

It is clear that a continuation of the kind of construction activities described above will intensify environmental stress. However, there are also many ways that the industry can adapt to its practices and change its activities that can substantially reduce environmental impacts. The concerns demonstrate that as long as construction activities exist, there will be some degree of environmental pollution due to unavoidable deforestation, resource wastes and other related activities. In other words, zero pollution from construction development is impractical if not impossible. Therefore, environmental management in the construction industry should not aim for absolute zero pollution, but an acceptable level of pollution (Yip, 2000).

2.2.3 Benefits and Potentials of Sustainability

Reducing the environmental impact is essential as a continuation of construction activity is essential to all aspects of development (Spence and Mulligan, 1995). Even though much of the activities need to be reconsidered, the authors argued that it is neither feasible nor desirable for the overall construction industry to be restricted. Despite its negative impacts on the natural environment, the construction of a dam, for instance, creates a lasting asset that can provide power, water irrigation and other benefits provided that it is well-designed and planned. Similarly, in housing construction, these stocks of human-made capital will be passed to future generations. Materials that have become part of the assets are still can be reused (although in a less useful form) in the future, thus in a way of compensating for the loss of natural capital.

The objectives of sustainability are to reduce energy usage and the protection of natural and social environments, providing not just a healthy and comfortable living environment, but also providing economic success for both developers and occupiers (Zhou and Lowe, 2003). Sustainability thus expands the consideration of financial aspects to include environmental and human capital costs as well. The significant economic benefits of sustainability, as asserted by Zhou and Lowe (2003) included the improvement in building durability and performance.

These are achieved through reduced maintenance and operating costs as well as increased productivity from ideal living and working place. The economic benefits of sustainability are held to be significant; they include the total cost savings, tax savings, added value, more efficient resource use, productivity improvement, increased organisation effectiveness, the generation of positive image and support for the local economy (Zhou and Lowe, 2003).

In addition, Yates (2001) explored the business benefits of sustainability and concluded that the benefits are diverse and potentially very significant. Those benefits included capital cost savings, reduced running costs, increased investment returns, increased productivity, staff recruitment and retention, more efficient resource use, and significant images or marketing spin-offs. Heerwagen (2000) highlighted that green buildings contribute positively to business performance and organisational effectiveness. First, green buildings are relevant to business interests across the full spectrum of concerns, from portfolio issues to enhance the quality of individual workspace. Second, the high performance of green buildings will influence the outcomes of organisations such as workforce attraction, retention, quality of life, work output, and customer relationships. Third, green building can provide cost reduction benefits and value-added benefits. Hydes and Creech (2000) used two case studies which demonstrated that the use energy efficient design could also achieve lower cost compared to a conventional design.

In summary, sustainability in the BE sector has a number of potential benefits, not only the short-term cost reduction but also in terms of whole life cost savings. Furthermore, it reduces natural and human resource costs; this is beyond the traditional perception of sustainability. These benefits are critical and will bring better value to the sector in general and particularly to the buildings, developers and end users. With all the benefits of sustainability as mentioned earlier, there are however, many challenges in the adoption and implementation of sustainability. The challenges, along with the driving factors are discussed next.

2.2.4 Drivers and Challenges for Attaining Sustainability

As a continuation of construction activity is necessary, solutions need to be identified to reduce the impacts on the environment. Some of the ways are through the improvement of land-use and pollution control and legislation, assessment of preconstruction environmental impact, extending the life of assets and as well as the reuse of existing buildings. Over the years, there have been many changes done in making the construction industry more sustainable. These changes, however, did not occur speedily (Inkoom and Leiringer, 2016) due to the fragmented nature and culture of the industry (Spence and Mulligan, 1995). In addition, many of those changes occurred with an incentive from the outside of the industry like the governments, for instance.

2.2.4.1 The Roles of Government: Policies and Legislation or Regulations

Liyin et al. (2006) stressed that institutional enablers such as the government are the key drivers of sustainability. The context set by government policy and legislation is crucial as it can set a general trend which creates the condition for innovation and progress towards sustainability (Spence and Mulligan, 1995). The UK, for instance, is one of the government-led sustainability initiatives (Ozorhon, 2012). The growth in the development of sustainable building in the UK is visible through the implementation of various government legislation (Manewa et al., 2016; Revell and Blackburn, 2007). The legislation, according to these authors, has encouraged developers to create strategies for newly proposed buildings. Chong et al. (2009) echoed this as they argued that the government could provide a clear direction, and this can be defined through a good policy on the goal and what they want to achieve.

Furthermore, the UK government has published a series of policies in order to request the construction industry to implement the principles of sustainability in the current and future projects (Zhou and Lowe, 2003) and to encourage improvement in terms of sustainability in the industry (Opoku and Ahmed, 2014). In 1994, the government issued the first strategy on sustainability and set out the general principles, objectives and approach to manage environmental issues (Hughes, 1996). In April 2000, a key policy document of Building a better Quality of Life: A Strategy for more Sustainable Construction was published that focused on the important contribution of the construction industry (DETR, 2000).

The UK strategy has been updated since and focusing on areas like natural resource protection and environmental enhancement, climate change and energy, sustainable consumption and production, and sustainable communities (DETR, 2005). Amendment to building regulations has encouraged much higher levels of energy efficiency in building design, and waste disposal regulations have encouraged builders to dispose of waste responsibly (Revell and Blackburn, 2007). The UK government also has a joint partnership with the industry to formulate a strategy for sustainable construction; this is part of the government's 2007 Sustainable Procurement Action Plan (HM Government and Strategic Forum for Construction, 2008). In July 2013, a new strategy which is known as Construction 2025 was published by the government that laid out a clear objective and vision for the UK construction industry by the year 2025; to become a world leader in sustainable construction (HM Government, 2013). The government has also issued a revised National Planning Policy Framework (NPPF) on July 2018 where Paragraph 150b stated that: "New development should be planned for in ways that: can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards" (UKGBC and Core Cities, 2018).

Government policy, legislation and regulation, therefore, appear to be the main driver for sustainability in the built environment (Akadiri and Fadiya, 2013; Koigi, 2017; Pitt et al., 2009). Many practitioners believe that more stringent environmental legislation is the only way to ensure that the construction industry can reduce its environmental impacts (Revell and Blackburn, 2007). A study by Akadiri and Fadiya (2013) discovered a positive correlation between government regulation and top management commitment towards sustainability and thus agreed that it is the most important determinant of sustainability practices in the UK.

2.2.4.2 Tenant and Client Demands

Tenant or client demands are the most effective driver for sustainability (Nelson et al., 2010; Spence and Mulligan, 1995) and one of the major drivers of innovative solutions in the BE or construction sector (Brandon and Lu, 2009). With increased environmental awareness, there is growing attention given to green buildings (Eichholtz et al., 2013) and clients would require their designers to act more sustainably (Spence and Mulligan, 1995). Nelson and Frankel (2012) asserted that tenants and clients who are looking to maximise efficiency and occupancy will search for buildings with high sustainability ratings. A building that adopt sustainable measures could lower operating costs over the life cycle of the building, thus offering a better economic performance to the tenants or clients (Koigi, 2017). In this regards, it is advisable to involve clients and users as early as the design development stage as they are likely to promote sustainability aspects into their construction project (Shelbourn et al., 2006). Moreover, tenants or clients may go with sustainability in order to promote a green image either for themselves or their stakeholders (Arif et al., 2009; Pasquire, 1999).

Owners or developers, on the other hand, can benefit from green buildings through higher selling and rental prices (Eichholtz et al., 2013). Higher prices of green buildings, according to the authors, could be imposed due to the incorporation of the cost of sustainable attributes into

the buildings. Due to the economic benefits of green buildings (e.g., energy efficiency), investors of commercial properties are willing to pay a higher premium (Eichholtz et al., 2010). As for real estate projects, the authors argued that there is inadequate evidence that can help to influence and convince the developers compared to commercial buildings. Zhou and Lowe (2003) affirmed that the lack of visible market value is one of the other reasons why clients or developers do not consider sustainability during the feasibility stage of project development.

2.2.4.3 Other Stakeholders' Commitments

With the continued concern of sustainability issues, apart from tenants, clients, owners, developers as previously discussed in Section 2.2.4.2, the other major players in the BE and construction industry such as designers, professional consultants and builders (to name a few) will also have to face the sustainability-related challenges. Some of the challenges are by meeting the demands of the existing and new buildings and facilities to be not just economically attractive but environmentally friendly and socially acceptable as well (Seah, 2009). In this case, the requirement of a close and collaborative relationship is needed between building stakeholders during the design, construction, and operation of the constructed sustainable buildings and facilities (Yip, 2000). Stakeholders in this context are people who directly and indirectly have vested interests in the building throughout those phases (design, construction and operation) (Yudelson, 2010).

According to the World Green Building Council (WGBC) (2010), stakeholders in the construction industry are becoming more aware of the need to embrace sustainability. This awareness, according to WGBC, is evident in the rapid establishment of Green Building Councils across the world. A study survey by Maduka et al. (2016) to examine the level of interests of key stakeholders in the UK construction industry revealed that the promotion of sustainability principles and practices are still below average. The authors insisted that the key

stakeholders and organisations in the construction industry play their part as progress can only be made through a concerted effort. The slow changes towards sustainability in the industry were due to the complexity of the construction sector that operated within the complexity of the social-ecological (Plesis and Cole, 2011). In this regard, the industry stakeholders are not ignorant of the sustainability issues; however, they have a different focus. Yip (2000) claimed that many clients and contractors, for instance, consider the environmental issues from their business benefit such as protecting the construction works, components and resources from the effect of the environment. The author added that only a few have considered the effects of construction-related activities on the environment.

In addition, clients were reportedly driven by commercial rather than environmental or social concerns (Revell and Blackburn, 2007). This is due to the traditional approach of construction activity where the main concern is on cost, time and quality (Yip, 2000). With extreme competition pressures, market dynamics were actively discouraging environmental reform, especially among the small firms (Revell and Blackburn, 2007). Therefore, due to the competition, the primary factors that will differentiate one firm from the other are the cost and speed of build that they could offer.

Environmental impacts have been given very little thought in most business agenda as clients' objectives are always a combination of the performance of the completed scheme within budget and time limit (Yip, 2000). In addition, as sustainability movement is changing the construction industry, it is time that the overall environment elements should be taken as a daily planning issue together with cost, time and quality aspects. From builders' perspectives, resistance to the business case for sustainability is partly due to unclear financial benefits of sustainability measures (such as energy and waste minimisation) (Revell and Blackburn, 2007). Since the

client is paying for the electricity on site, there is very little financial incentive to pursue energy efficiency measures.

There is also a perception that waste separation is very time consuming. Thus, materials are rarely recycled (Vassanadumrongdee and Kittipongvises, 2018). Even reusing old materials such as steel, for instance, is considered more expensive than buying a new one after the costs of labour, storage and transportation are factored in (Dunant et al., 2018). Therefore, the barrier is not just about financial cost but also the effort and time involved when adopting environmental measure and management into a project. Due to these factors, even economic incentives such as landfill tax have done little to encourage eco-efficiency amongst builders especially ‘cowboy’ builders who are always attempting to keep the costs down (Revell and Blackburn, 2007).

As discussed in Section 2.2.3, greater concern for the environment will be good for public relations and as well as for business. Therefore, to protect, manage and improve the environment is everyone's social responsibility, including construction key stakeholders.

2.2.4.4 Information Dissemination and Lack of Awareness or Interests

A study by Chong et al. (2009) on the perceptions of the BE’s practitioners revealed the fragmentation of knowledge on sustainability within the sector. Without any agreed standard in the definition of sustainability, stakeholders tend to adjust the concept to suit their particular need and the professionals to fit into their profession since they are more familiar with their fields. Moreover, as most of these professionals’ practice within their areas, they do not have sufficient knowledge in the other fields; thus, the process of integration and crossover of knowledge between different fields can be complicated. Furthermore, BE stakeholders do not

have a platform to integrate their knowledge. As a result, many people involved do not have access to valuable information related to sustainability.

Due to the above reasons, Cushman et al. (2005) suggested that coupled with campaigning; there is a need to provide more information and understanding of the benefits of sustainability within the construction industry. Sustainability is among the last factors that would be considered when a project is being commissioned (Neal et al., 2000). This is due to the fact that decision making that takes into consideration of the environmental, social and economic aspects (the three-pillar model of sustainability proposed by the United Nations) can be filled with uncertainty of what will occur over time (Gluch and Baumann, 2004). Furthermore, coupled with the perceived additional cost when adopting sustainability, Revell and Blackburn (2007) stated that most developers, tend to focus on short-term capital costs and benefits rather than lessening the environmental effects of their buildings and developments. With a lack of knowledge and information on sustainability-related systems, stakeholders tend to opt for traditional methods of building (Dair and Williams, 2006).

Moreover, a lack of awareness on the benefits of sustainability could also lead to a lack of demand for sustainable building (Hakinnen and Belloni, 2011). Due to this, there is also a need for effective and efficient marketing for sustainability that can provide buyers and the general economy at large, to understand the benefits of sustainable buildings (Zainul Abidin, 2010). Hakinnen and Belloni (2011) argued that as buyers become aware of the economic benefits of sustainability, they are more likely to adopt or get involved or demand sustainable development. The increased demand and supply can improve the affordability of sustainable development that will eventually be able to penetrate the entire economy rather than just to the exclusive clients (Zainul Abidin et al., 2013). The authors also added that through the increase in market demands, sustainable design and practices could be developed better.

The lack of knowledge and awareness of sustainability, as suggested by Ugwu and Haupt (2007), can be addressed through training. Education would be an effective way to improve the professional, ethical judgment of construction practitioners, which may enhance the awareness of social responsibility and sustainability in their professional practices (Law, 2015: p.262). Well-informed stakeholders on the sustainability issues, for instance, coupled with a supportive environment, are likely to make high impact decisions on the implementation of sustainability initiatives (Glass et al., 2008). Zhou et al. (2018) claimed that a combination of efforts and awareness on green and sustainability principles can play a conclusive role in the implementation of sustainability practices. In regards to these, Section 2.4 discussed the initiatives taken by BE educational disciplines in preparing future professionals with sustainability-related knowledge, awareness and skills.

2.2.4.5 Building Environment Assessment Schemes

Building environment assessment schemes (also known as green building guidelines) emerged to help categorised vast ranges of environmental criteria that are related to buildings (Inkoom and Leiringer, 2016). According to the Inkoom and Leiringer (2016), the schemes provide the means for builders and designers to identify and specify the environment criteria based on the client's needs. The evolved schemes have allowed the industry actors to assess the environmental performance of the buildings objectively.

The first assessment scheme was established by the UK Building Research Establishment in 1990; the Building Research Establishment's Environmental Assessment Method (BREEAM). According to Bartlett and Howard (2000), BREEAM has been shown to add financial value to developments thus reinforcing the value of building green, and the schemes can also be applied to existing buildings as well. It is one of the most commonly used tools in the UK that provides a broad range of assessment on the building's environmental impact (Dixon et al., 2008; Yates,

2001). The UK Department of education (also known as a department for Children, Schools and Families) requires that funded new built or refurbished primary or secondary schools to achieve BREEAM "very good" as the minimum requirement. Similarly, higher education in England uses BREEAM to assess building performance and also uses the universities' carbon reduction performance as a funding requirement (Xiong, 2014). BREEAM has become an international sustainability standard that its application has helps clients to reduce their building's environmental impacts (Telichenko et al., 2018)

Since then, there have been many other assessment schemes developed such as LEED (United States), Green Star (Australia), CASBEE (Japan), Green Building Index (Malaysia), and Green Mark (Singapore). du Plessis and Cole (2011) posited that most developed countries, as well as those rapidly developing, now have their own domestic assessment schemes. Many developing nations are also in the process of localising existing assessment schemes to suit their industries. In Malaysia for instance, Zainul Abidin (2010) contended that with the launching of GBI, more developers are expected to start aiming for green certification. As the interest of the developers improves, the rest of the industry's stakeholders including manufacturers will be pulled towards the same direction as well. These efforts are motivated by the need to encourage green building practices that align with the global sustainable agenda.

The majority of assessment schemes are voluntary in their application (Ding, 2008; du Plessis and Cole, 2011). Thus, there will not be any strict regulations regarding their adoptions, unlike the mandatory schemes that would specify minimum certification requirements (Inkoom and Leiringer, 2016). Mandatory schemes are, therefore, increasingly being used as incentives for development and planning approvals. As a result, building professionals have no choice but to respect and adopt the assessment schemes that are mandated in a project.

Voluntary schemes, on the other hand, are not as easily adopted. Similar to the concept of sustainability, ‘green building’ has a variability of meaning as well. This issue has posed a challenge of how the assessment schemes can be operationalised when various actors involved have different interpretations over how the green building concept should be framed into the scheme. Due to this, there has been an increasing rejection of the assessment criteria as authentic measures of green building (Schweber, 2013). Inkoom and Leiringer (2016) argued that, from their observation, professional actors have been criticising specific categories or credits as are either being inadequate or wrongfully capturing the green building concept. This issue is due to the fragmented nature of the construction industry and the different professional practices. Moreover, the issue has also raised the question of how to engage and collaborate with professional actors from different disciplines with varied views of achieving green building. Section 2.3.1 (the roles of the BE professionals) will focus on this question. Another issue in the uptake of the assessment scheme is the lack of knowledge and expertise among the BE professionals (Dixon et al., 2008). This issue, according to the authors, reflects a lack of training and education in relevant techniques.

A growing focus on sustainability has led the construction industry to shift more focus on the production of buildings that are deemed to be sustainable (Berardi, 2011). In doing so, the construction industry is facing a real challenge (Ugwu and Haupt, 2007). Some of the challenges in practising sustainability within the BE sector are a higher risk due to the uncertainty of the outcome from sustainability measures, increasing construction cost, specifically the initial cost where most developers, investors, i.e. business-related stakeholders are more inclined to go for short-term gains rather than long-term benefits apart from the lack of visible market value.

2.2.4.6 Cost

Some say that when it comes to the construction project, adopting sustainability will impose an additional cost on the project (Pasquire, 1999) especially on the higher capital costs (Zhou and Lowe, 2003). Hydes and Creech (2000) provided evidence against the belief that the adoption of sustainability will cost more by analysing two green building projects. They concluded that balancing the aspects of social, environmental and economic concerns in an energy efficient design can result in cost saving and reduce the capital and operating costs. As has been discussed in Section 2.2.3, there are various business benefits of sustainability, and the potentials are quite substantial (Yates, 2001).

According to Chong et al. (2009), adopting sustainable solutions could bring cost saving and long-term benefits from the resource, energy, and water savings and as well as improve the occupants' productivity. However, they also argued that these solutions might incur more cost initially, and due to this, many developers may have shied away from them. Some architects and builders from small firms also perceive that due to the higher initial cost, there would be a potential that they might lose a client if environmental agenda is being pushed too enthusiastically (Revel and Blackburn, 2007). Winston (2010) opined that for sustainability to be taken into consideration, developers, need to secure a significant amount of money which at times can be quite challenging and can result in higher selling prices. Furthermore, Hwang and Tan (2012) stated that higher cost and high selling prices lead to low market demand for sustainable buildings and development. Since buyers are unable to afford it, they will not buy despite the benefits that they may accrue in the long run (Dair and Williams, 2006; Zainul Abidin et al., 2013).

Furthermore, Ries et al. (2006) noted that when it comes to the final decision making, scheduling and costs are the major factors that need to be considered. The decision is being made with little concern for the long-term benefits such as the significant cost savings. A study by the Building Research Establishment (BRE) revealed that investors relatively receive less financial burden throughout the whole life costs of a building (Yates, 2001). This is due to the fact that they only provide funding and therefore are more concerned with the returns of their investment rather than the imposed operational costs or what is going to happen afterwards. Therefore, the short-term decision-making approach, as opposed to considering the lifecycle of the project will prevent the ability to make effective and well thought out decisions (Ugwu and Haupt, 2007). McDonough and Braungart (2009) argued that lifecycle or 'cradle to cradle' concept could only be achieved through knowledge integration of design, operations, chemistry and materials' end of life. Therefore, the extensiveness of knowledge required to achieve sustainability may have prevented it from being put into consideration. High building costs are a major barrier to industry participants wanting to implement sustainability within their project, and as a result, only a few sustainable building projects are available in the industry (Eichholtz et al., 2010; Neal et al., 2000; Revel and Blackburn, 2007). In this case, what would be the roles and responsibilities of the BE professionals in relation to sustainability?

2.3 Sustainability and the Roles of the BE Professionals

When the world started to have concerns over the issue of sustainability, many aspects are beyond and outside the scope of a typical BE professionals' practice at that time, for example assessing the environmental impact of a project (Pasquire, 1999). Thus, looking through this issue, a study by Pasquire (1999) revealed that, the BE professionals have already considered the environmental issues in their decision making during the construction management process. Some of the environmental issues are pollutants (e.g., water, atmospheric, noise and hazardous

materials) from the construction industry, resources, energy use, waste and recycling. Therefore, from this finding, the author believes that these professionals can play a significant role in managing environmental sustainability in construction projects. In this instance, the next sub-section will discuss the roles of BE professionals in term of sustainability.

2.3.1 The Roles of the BE Professionals

Xia et al. (2015) asserted that since the BE professionals' decisions can have a critical impact on the society and the environment, and this has made sustainability considerations (including environment, economy and social) very important to these professionals. Moreover, a study by Yusof et al. (2016) indicated that professionals also have an influence on exerting sustainability within the project that they are involved in. However, from preliminary observation, Chong et al. (2009) asserted that most of the sustainability efforts may revolve around certain professionals such as the architects or designers, environmental and mechanical engineers as their works surround energy efficiency and environmental protection. Nevertheless, within a single construction project, there could be various multidisciplined professionals involved (Ozorhon, 2012) who are part of a project team established to perform and deliver the project. Therefore, the responsibility for sustainability adoption may fall on these professionals and not just on certain professionals.

According to Sorrell (2003) achieving a green building requires an integrated team that combines a wide range of different specialists. These professionals scope of responsibilities are does not only involve shaping the aspects of the BE but also the influence that they have as well (Dassah and Nimlyat, 2010). It is the kind of influence that might provide a useful platform in contributing to the sustainability debates provided that they are aware of what is going on (issues relating to sustainability). Findings by Aigbavboa et al. (2017) revealed a slow permeation of the concept of sustainability among South African's construction professionals

that contributed to various “lazy view” on the adoption of sustainable construction practices. Therefore, construction professionals’ sustainability awareness ought to affect construction practices, planning decisions, sustainable design decisions, eco-friendly specifications and many more.

Moreover, Myers (2005) argued that for the professional team to make meaningful contributions towards sustainability, they need to consider the complete life cycle of the building project; from its design to deconstruction. Talukhaba et al. (2005) attested that in order to encourage key stakeholders to consider and adopt sustainable measures, professional teams need to understand the whole life costs and as well as environmental impacts of construction projects. The understanding is essential as the information that they provided can be extremely useful in influencing decisions made by decision makers (Bartlett and Howard, 2000). Through the whole life cycle approach, this professional team can help clients, not just in making sure that the building is fit for its purpose(s), but also for the to receive cost benefits initially and in the future, as well as fulfilling a cultural significance and environmental friendly.

As the above scholars agreed on how professionals can contribute to sustainability through the life cycle approach, Ive (2006) argued that it is not easy to evaluate the whole life cost of the building due to the lack of adequate data available. This issue is one of the challenges in the adoption of sustainability in a project. Those data are mainly concerned with the operating costs and the added value of the buildings (Ive, 2006). Therefore, this can cause a problem to the design team in particular, since it will be difficult for the team to provide competent advice without sufficient evidence. Are they willing to take responsibility by providing advice without enough data? As some of the BE professionals are governed by their professional body, actions could be taken upon them if their client is not satisfied with their services. Although it might not be legal action, it would cause damage to their reputation. Therefore, are these professionals

willing to take the risk? In regard to the governing bodies, what would be their roles towards sustainability? This question is discussed next.

2.3.2 The Roles of the BE Professional Bodies

Chong et al. (2009) posited that professional bodies can and should play a major role in promoting sustainability. The authors stated that these bodies could act as a platform for sustainability-related knowledge and information sharing, transfer and dissemination. Newell and Swan (1995) reported that professional bodies have the ability to be the mechanism for innovation. This, according to the authors, can be achieved through their role in diffusing knowledge to professionals or practitioners and linking members from different organisations. Law (2015) stated that one area of professional bodies could promote knowledge of sustainability and as well as encourage social responsibility is through their Continuing Professional Development (CPD) programme. Some of the governing bodies have their guidelines regarding their CPD approach. The Royal Institution of British Architects (RIBA), for instance, required its members to take CPD for at least thirty-five hours every year with a total of twenty hours of training covering ten core topics and one of them is climate and sustainable design (Pooley, 2016). The Chartered Institute of Building (CIOB), however, does not have a prescribed curriculum but continue to monitor the CPD activities as it is part of a condition for membership (Pooley, 2016).

Kibert (2007) argued that, in order to support sustainability, there is a need to change the approach to professional education. According to the author, there have been adequate demonstrations in the short history of sustainability in a construction project of the importance of integrated design teams (including stakeholders) that can produce far better buildings with precisely the same brief compared to the conventional relationships. Therefore, the BE sector, as assert by the author, should place the responsibility on the shoulder of professional bodies as

they are representing the building project teams. Teamwork and collaboration skills can be developed as early as formal professional education through professional bodies' accredited programmes.

Hill et al. (2013) stated that the degree of embedment of sustainability principles from professional bodies could only be achieved through their codes and policy. The RICS Sustainability Policy, for instance, stated that:

> "'RICS members are uniquely placed to contribute towards sustainability and to judge the viability issues that will determine how sustainable development should be delivered." (RICS, 2007; p.9)

The Institute of Civil Engineers (ICE) adopted the language of sustainability in their code of professional conduct as follow:

> "The duty upon members of the ICE to behave ethically is, in effect, the duty to behave honourably; in modern words, 'to do the right thing'. [...] Members of the ICE should always be aware of their overriding responsibility to the public good. A member's obligations to the client can never override this, and members of the ICE should not enter undertakings which compromise this responsibility. [.. .] The 'public good' includes care and respect for humanity's cultural, historical and archaeological heritage (and) to protect the health and wellbeing of present and future generations and to show due regard for the environment and for the sustainable management of natural resources." (ICE, 2015)

The ICE thus claiming that their activities take into account the public interest that must be in the 'public good'. The Royal Institute of British Architect (RIBA) code requires its members to be aware of the impact of their work on the environment (RIBA, 2005). Within the Chartered

Institution of Services Engineers (CIBSE) code of professional conduct, members are called upon to:

> "Promote the principles of sustainability and seek to prevent the avoidable adverse impact on the environment and Society." (CIBSE, 2017)

The UK government, along with professional bodies (e.g., the RIBA) is paying significant attention to the issues of climate change and sustainability (Pitt et al., 2009). Therefore, apart from the government, the UK BE professional bodies according to Green (2015) have always engaged and played an important part in policy formation and have introduced various regulations and policies about sustainability (Law, 2015). The RIBA, for instance, apart from having an 'influencing policy' page on its website, the body also has a policy department that coordinates its efforts in this area (Janda and Parag, 2013). In this regards, the RIBA goals are:

> "To help, inform and influence government policy and offer policy solutions which will help architects produce better buildings and communities." (RIBA, 2012)

In addition, the ethical code within the professional practice still needs to be measured because it is not only for a transformational manifest alone. However, some argued that the code of conduct only exists for the sake of the clients while disregarding the public, the natural environment and also the building's users and occupiers (Spector, 2001). The arguments are focused on social responsibility in terms of moral judgement and making decisions regarding the natural environment in the context and reality of buildings. The Royal Institution of Chartered Surveyors' (RICS) rules of conduct, for example, as had been previously seen to protect the public but has not explicitly mentioned the impact on the natural environment. However, on The Architects Code, Standard number 5, the RIBA expected their architects to:

> "Where appropriate, you should advise your client how best to conserve and enhance the quality of the environment and its natural resources" (RIBA, 2017: p.6)

In summary, despite many barriers to sustainability that have been discussed in this section, sustainable construction is being accepted by the construction industry globally. The central economic theme is to efficiently use the resources to achieve the maximum benefits for all the stakeholders in the BE sector. In the UK, for instance, the government has introduced various instruments and published a series of documents intended to encourage the construction field and market towards sustainability and adopting sustainable construction.

Additionally, the discussion has also identified an increase in the quantity and range of research into issues of sustainability since the 1992 Earth Summit. Furthermore, to achieve sustainability, it is not just one person, one organisation or one professional body's effort; it needs to be a collective effort from all the construction industry stakeholders. In order to adequately respond to sustainability issues, education and training are essential to all stakeholders concerning the long-term benefits of SC. Agenda 21 of the 1992 Earth Summit stated that "education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues" (UNCED, 1992: Chapter 36.3). These education and training aspects are discussed next.

2.4 Sustainability in BE Professional Education

The building sector alone accounts for 40% of energy use in the world, related construction activities affect the environment negatively and widely, including dust and waste generation, land occupation, pollution and noise (Zhao et al., 2012). Because of such substantial environmental impacts of the construction industry (Hill and Bowen, 1997; Ofori, 2000), increased awareness of sustainable building construction is thought to be key to environmental

impacts and finding the best practices (Pitt et al., 2009). Therefore, a better way of increasing awareness is through education and training.

2.4.1 The movement towards Education for Sustainable Development (ESD)

The push for ESD is believed to have originated from the Stockholm Declaration 1972 (Wright, 2004). Subsequent to this, the first public commitment to environmental sustainability in the Higher Education (HE) is through the Talloires Declaration (1990) (ULSF, 2015). According to ULSF (2015), it is a ten-point action plan for incorporating sustainability and environmental literacy and it was signed by over 500 presidents and chancellors of universities worldwide. In 1997, UNESCO issued a report declaring: "education is the most effective means that society possesses for confronting the challenges of the future. Indeed, education will shape the world of tomorrow" (UNESCO, 1997: Paragraph 38).

The urgency for ESD increased when the United Nations (UN) launched the UN Decade of Education for Sustainable Development (DESD) 2005-2014 with the overall goal "to integrate the values inherent in sustainable development into all aspects of learning to encourage changes in behaviour that allows for a more sustainable and a just society for all" (Holmberg and Samuelsson, 2006: p.4). These various declarations asserted that Higher Education Institutions (HEIs) can play an essential role in sustainability initiatives as the academics and the HEIs are well suited to become the prime movers of sustainability on awareness and problem solving of sustainability challenges through education, research and outreach (Mochizuki and Fadeeva, 2010).

In addition, a number of scholars (Buckler and Creech, 2014; Zilahy and Huisingh, 2009) reported that education is increasingly recognised as fundamental to move the sustainability agenda forward. According to these scholars, sustainability education aims to produce

graduates with the knowledge, competencies, values and attitudes needed for the sustainability agenda and will bring these attributes into their workplace to help build a sustainable future. Some academics seemed to be well suited not just to provide knowledge and awareness to their students but also to bridge the gaps among different people within their organisation. However, findings from empirical research by Zilahy and Huisingh (2009) revealed that there are many hindrances in realising the HEIs potential roles, and communication problems and differences in organisational cultures are some of them. Something needs to be accomplished in order to utilise their potential.

As previously discussed, universities are well positioned and suited to become leaders towards encouraging sustainability, specifically within their communities and region. Tony Cortese argued that "Higher Institutions have the unique freedom to develop new ideas, comment on society and engage in bold experiments, as well as to contribute to the creation of new knowledge" (Wals and Jickling, 2002: p.224). This statement is significant as it gives a good reason for a new approach to problems to be explored. The new approach is necessary to address the complex challenges of sustainability. According to the statement, new knowledge is required and HEIs (or universities) are fitting for using such knowledge in applying, developing, and promoting the ideas and as well as the values of sustainability. With their expertise in sustainability, HEIs could effectively foster useful knowledge, awareness, and competence to future professionals who can contribute in sustainability through their professions and future career in decision-making or policymaking (Barth and Timm, 2011; Cortese, 2003 and Fien, 2002). This comprehensive understanding of the relevance of sustainability could also provide a more meaningful connection with sustainability on a personal, professional and aspirational level.

Furthermore, education has been seen as a way of improving the quality of life of individuals and as well as the whole of humankind (Galang, 2010). Even though education is important, it does not guarantee change. Education is a complex issue. Adding an abstract concept like sustainability makes it even more complicated. Sustainability education, especially in HEIs, requires a transition from theory to practice and holistic approach meaning that a practice that "analyse a thing from the outside and asks questions about how it works" (Lozano et al., 2013: p.1). Capability requirements for ESD are not just skill, knowledge and understanding, but also specific values and attitudes as well (Korenic, 2014). Therefore, learning can, and perhaps should provide knowledge about the basic elements of sustainability in a way that will make it become a practical and emotional reality in students' lives. It will allow them to integrate the concept into everything that they do and enable them to connect it to their future occupational role. This is postulated by Sterling (2001) as transformative learning that informs future practice and engages a whole person and learning institution. This type of learning, also known as education as sustainability that is part of the three forms of responses in ESD modelled by Sterling (2001). The other two types according to the author are education about sustainability that considers learning as maintenance and focuses on developing knowledge and understanding while education for sustainability moves beyond 'about' and teach values and skills associated with sustainability, i.e. learning for change.

Sterling's (2001) model indicated that there are varieties of responses to sustainability within the educational system, and this is also echoed by UNESCO (2006), especially since the DESD. Some are successfully applied in certain HEIs, but there is still a question whether they are appropriate for other HEIs in other institutions and countries as they are yet to be tested in a global scale (Lozano-Garcia et al., 2006). To observe successful educational models, university curricular in regard to sustainability can be a valuable indicator.

2.4.2 Strategies in Adopting ESD

There are a few scholars who provided practical strategies to integrate and implement sustainability, and to further education for sustainability in the university curricula (Andamon and Iyer-Raniga, 2013; Celik et al., 2014; Jucker, 2002; Lu and Zhang, 2013; Pearce and Ahn, 2010; Stewart, 2010). Integration into existing curricula, new learning approaches, the inclusion of topic, development of independent courses or extracurricular activities is part of the steps that be followed. It can be embedded as a whole or partially depending on the integration and the approach of universities.

i. Inclusion of topic

For the inclusion of the topic, the most straightforward way that this can be achieved is through a lecture series (Barth and Timm, 2011). This approach according to the authors could offer the opportunity for introducing new topics and can also enable different disciplines to contribute as well.

ii. Independent course or module

The development of an independent course or module is a more in-depth approach that can be applied to various disciplines. This approach, as asserted by Hayles and de la Harpe (2007), is possible to help students to develop their understanding and awareness of sustainability issues. They, however, argued that this capacity is not easy to achieve through participation in a one-off or stand-alone module experience only. Hayles and Holdsworth (2008), however, believed that this stand-alone, independent sustainability module could serve as a starting point for further integration into existing modules or curricula. For example, Newcastle University, UK introduced a new first-year sustainability module in 2006 with the original aims to introduce

the concept in the context of civil engineering and to act as a catalyst for sustainable thinking in students' studies beyond the first year (Bramald and Wilkinson, 2009).

iii. Integration into existing curricula

Integration into the existing curricula, as suggested by Hayles and Holdsworth (2008), should be the ultimate outcome. In addition, there is a potential curricula reform through the integration of sustainability into the existing curricula, and this approach indicates the programme's attempt to evolve in understanding and solving complex issues (Barth and Timm, 2011). Through curricula integration, sustainability is not just being seen as a positive addition to a project's outcome, but more importantly, students will value it as an essential requirement of the project itself (Altomonte et al., 2014).

iv. New learning approaches

The new learning approaches may be self-directed with problem-based learning in order to assist students to develop critical thinking on issues of sustainability (Douvlou, 2006). New approaches should take into consideration the insight that "knowledge cannot simply be transferred but must be both individually generated in specific situations" (Barth and Timm, 2011: p.14). As pointed out by Hayles and Holdsworth (2008), traditional lecturing methods are inefficient in helping students to recognise the real issues of sustainability. Holdsworth and Sandri (2014) suggested that ESD needs to overtly challenge students and allow discussions on the complexity of sustainability issues so that students are exposed to a learning experience that is participatory as well as respectful of the different perspectives. A study by Sivapalan (2017), for instance, found that the integration of sustainability into a non-technical module (professional communication skills module) and the use of blended and flipped learning has increased students' awareness of the three dimensions of sustainability (environment, social

and cultural). The module has also developed the students' soft skills such as interpersonal communication and the ability to work individually and in a team in finding solutions for sustainability-related issues. Students found that the integration approach of flipped and blended learning useful in helping them with research and developing ideas for their sustainability-related topics.

Also, one of the important current trends that many scholars believe would bring benefit and fitting for future needs is the incorporation of building information modelling (BIM) with sustainability education (Rathnayaka and Coates, 2016; Wu and Hyatt, 2016; Zhang et al., 2016). BIM technology is essential to sustainable design and can provide an accurate automated sustainability compliance checking (Zhang et al., 2016). The incorporation of BIM and sustainability using experiential and project-based learning approach had enhanced students' understanding, skills and as well as enhanced their leadership skills, entrepreneurial spirit and engagement in learning (Wu and Hyatt, 2016). Students believed that it is important to engage with topics that are relevant to their future profession.

Therefore, with new learning approaches, students learning experience would be more enriching. This learning enrichment is especially when incorporating technologies that suit the current trend and as well as students' interest as these would be helpful in making the students more engaged with their learning. This will consequently lead to the acquirements of relevant knowledge and skills that can drive towards more sustainability practices and adoptions.

2.4.3 ESD in the BE Disciplines

Some of the above literature on the HEIs actions and strategies in incorporating sustainability involved the BE discipline as well, indicating that it has also been embedding these strategies into its curriculum. From the literature search, sustainability in BE education has been identified as early as the year 2000. Environmental education, on the other hand, has been incorporated earlier than that. Apart from implementing the strategies previously described, the discipline also incorporated delivery approaches that relates to the discipline and the nature of the industry like project-based learning (Korenic, 2014; Pan and Garmston, 2012; Siddiqui et al., 2012) and interdisciplinary team or collaboration approach (Korkmaz and Singh, 2012; Valdes-Vasquez and Clevenger, 2015) and the combination of the two approaches (Brncich et al., 2011; Holley and Dagg, 2006).

The BE sector essentially requires professionals from different disciplines and sectors to work in a team to develop, collaborate and deliver project together (Braganca et al., 2010). Wright (2003: p.104) stated that "sustainability is an activity of the collective, underlined with the need for co-operation and teamwork". This characteristic is also similar to construction-related activities as well. Therefore, sustainability educational approaches within the sector require the same multidisciplinary, holistic and project-based approach. Lyth et al. (2007) acknowledged the need for cross-disciplinary teamwork between students and professionals in order to understand sustainability issues, to share best practices, and to collectively solve them. A study by Brncich et al. (2011), on a case study that incorporated an integrated, cross-disciplinary project delivery activity in sustainable design and construction revealed the positive effects in educating students about the integrated delivery process. Through strict sets of requirements and rules, students were able to learn to communicate and build their teamwork skills in order to achieve their goal. This experience prepares them for their future role in confronting a market

that demands buildings that are not only sound and cost-effective but sustainable as well (Brncich et al., 2011). Korkmaz and Singh (2012) posited that in sustainable projects, there might be more than one solution to a specific problem. The solutions, according to them, usually depend on more than one area; thus, communication and teamwork between members from different disciplines is critical for the success of sustainable projects.

In addition, interest in sustainable design and construction, according to Bourdeau (1999) is growing that will consequently change the way buildings and infrastructures are built, maintain and operate. Therefore, future professionals need to be equipped with sustainability competency. Skills that construction companies recognise as the most important and valuable that they require from their new hire would be ethics, critical thinking and problem solving (Ahn and Pearce, 2007). Lyth et al. (2007) suggested that, apart from many specialist competencies to develop, there are also a number of generic sustainability competencies that graduates as well as established practitioners need to develop as well. These competencies according to the authors are the ability to work in an integrated team to solve problems (similar to what has been previously discussed), being able to engage creative ideas and lateral thinking outside of the practical norms. Students also need to acquire the capacity to make more informed choices and decisions and shape more sustainability attitudes and actions for successful task performance with respect to sustainability challenges and opportunities (Wiek et al., 2011). As for students preparing for professional fields, like the BE and construction professionals, they should reflect how sustainability can influence their future professional role and the possibility of them, as a professional, contributing to sustainability.

Mochizuki and Fadeeva (2010) propound that education and training are key to driving change and achieving sustainable development. They also profess that professionals need the ability to deal with the challenges of sustainability to enable progression. Therefore, in order to encourage

change, Segalas et al. (2012) propose that sustainability education not just needs to provide in-depth knowledge but also build capacity to obtain sustainability skills that are in accord with students' future professional practice. Other scholars suggest a non-traditional teaching method that can successfully transform the knowledge learned into changes in behaviours (action) and values (Anderberg et al. 2009; Barth et al. 2007; Brundiers et al. 2010; Domask 2007; Wahr 2010). This suggestion is in accord with the assertion by UNESCO (2006: p.4) where ESD purpose is to integrate "the values, behaviour and lifestyles required for a sustainable future and positive societal transformation" into aspects of education and learning. ESD is therefore about empowering people for change at a personal level as values are as cited in Murray et al. (2014) tied to emotion.

In this instance, apart from intellectual capacity, future professionals will also need to possess emotional capacity too as asserted by Iyer-Raniga et al. (2010: p.1453), "to be instigators of change they will have to be literate in the broader moral, ethical and social implications of sustainability, and be motivated on a personal level through an aspirational connection with their own desired futures". Other scholars also believe that emotions play an important role in a change towards pro-sustainability (Kokkarinen and Cotgrave, 2010; Robinson and Sutterer, 2003). The emotional or affective learning domain has been described by Jickling and Wals (2008) and Eilam and Trop (2010) as a key element of ESD on the basis that it helps develop personal attributes that can be motivational in embracing changes and acting sustainably. Although these scholars assert that values and emotions matter in ESD as they can influence and motivate behaviour, however, existing literature in the BE educational sector in relation to sustainability identified that there are only few research that engage with these two concepts. This is probably one of the reasons why students did not feel personally engaged with the sustainability concept even though the BE (professionally focused building degree

programmes) education delivered a high level of applied, discipline-specific sustainability in their curriculum (Murray et al., 2014).

The BE educational sector teaches students intending to practice in a professional area. As stated by Hughes and Hughes (2013), graduates entry schemes in the UK, for example, are now the standard entry route into the professions. The BE is a professional education that prepares students with knowledge for action and exposed students to a range of future professional routes that reinforces and shapes a particular professional identity. This is apparent in the Quality Assurance Agency (QAA) subject benchmark statement for Land, Construction, Real Estate and Surveying where students will not just be exposed to subject knowledge and understanding but also to develop personal and professional skills that should continue to develop and refine throughout their professional lives (QAA, 2016). Even with regards to the sustainability agenda, compared to the previous version (QAA, 2008), it can be seen clearly that the new subject benchmark has taken more efforts towards the issue, especially within the subject-specific knowledge and understanding.

The HEIs educate people that will shape the future society. Therefore, professional education as opined by Dunphy (2013) can help in supporting environmental sustainability. The author also asserts that it can also be transformed in order to promote environmentally responsible behaviour. These educated professionals posited by Svanstrom et al. (2008) will likely be the most influential decision-makers and they will educate citizens and other professionals on all levels. Law (2015) echoed this as the study found that education has a significant positive effect on the moral judgment of construction professionals. The author thus suggests that professional education would be an effective way to improve professional ethical judgment of construction practitioners that consequently would enhance awareness of social responsibility and sustainability in their professional practices. These are also major goals of education in the

Declaration of Barcelona where it stated that the future professionals "should be able to use their expertise not only in a scientific or technological context but equally for broader social, political and environmental needs" (Svanstrom et al., 2008: p.342).

2.4.4 BE Professional Accredited Programme

In the UK, BE education, especially in some programmes, is either being monitored or controlled by professional bodies. Some of those programmes' disciplines, for example, are architecture, engineering, surveying and construction management to name a few. In response to Agenda 21, the UK government established a Sustainable Development Education Panel (SDEP) in 1998 in order to consider education for sustainability (UK Parliament, 2018). The SDEP proposed that all professional bodies embed sustainable development within their course accreditation criteria (Perdan et al., 2000). In response to this, all the major professional bodies require elements of sustainability to be embedded within accredited built environment education programmes (Murray, 2009) as shown in Table 2.1 below.

Table 2.1 Key construction-related professional bodies input to education for sustainability

Discipline or professional body	Curriculum influence	Sustainability focus
Architecture: Royal Institute of British Architects (RIBA)	Outcome based 'Criteria for Validation' used in accreditation visits.	2002 Criteria includes design-specific social, cultural and environmental learning outcomes, and specific skills requirements.
Construction Management: Chartered Institute of Building (CIOB)	Requirement to comply with 80% of outcome-based *Education Framework*; with accreditation visits.	Framework refers to environment aspects and broad social, ethical and cultural issues. Some specific skills requirements relate to sustainability.
Engineering: Institution of Civil Engineers (ICE); Institution of Structural Engineers (IStructE); Chartered Institution of Services Engineers (CIBSE)	ICE or CIBSE or IStructE published curriculum expectations through 'Joint Board of Moderators', with peer review and departmental visits.	Need for sustainable development delivery in degree programmes with detailed lists for knowledge, skills and attitude development published July 2005.
Planning: Royal Town Planning Institute	2001 Education Policy Statement issued as guidance.	Sustainability, social, economic and environmental contexts and appropriate knowledge themes referred to.
Surveying: Royal Institution of Chartered Surveyors (RICS)	Curriculum expected to support sustainability as a professional competence.	RICS announces need to address education for sustainability. No other formal requirements.

(Murray, 2009)

The importance of sustainability for the BE professions is a point that has been targeted in several prominent taskforces at a national level in the UK (Egan, 2004). In addition, the government's SDEP also set a target of achieving the inclusion of sustainable development criteria within all course accreditation requirements for the professions and industry led bodies by 2010 (DETR, 2000).

The BE educational programmes are predominantly professional accredited courses. Therefore, the programmes have a strong need to respond to external forces and influences in order to produce graduates or future professionals equipped to work in a challenging and evolving context of the sector (Iyer-Raniga and Andamon, 2012). At the University of Reading for example, the quantity surveying degree programme is accredited by the RICS and by the CIOB. In the programme, sustainability aspects have been embedded in a few of the core modules throughout the whole three years of the programme (University of Reading, 2017a). There is one specific sustainability module as part of the third year's core module. It aims to provide students with the understanding of the meaning of sustainability in the context of the built environment and the needs and importance of sustainable development, and challenges of the implementations. The module also covers renewable energy, assessment methods in measuring sustainability criteria, sustainable materials, land contamination and remediation and water efficiency.

As discussed, many initiatives and approaches have been adopted and deployed in responding to the sustainability issues within the BE discipline, and quite a number of them are already engaging in transformative learning. Here are some of the examples and outcome of such implementation on a micro, institutional level:

- Cowling et al. (2007), through a longitudinal study, explored the development of students' interest, familiarity and understanding of sustainability when Kingston University's School of Surveying incorporated the concept into their curriculum. Via entry and exit questionnaires, the study revealed an encouraging indicator that students recognised the importance of a good understanding of the principle of sustainability for their future career. However, in terms of personal lifestyle choices, they have not adopted even the simple action towards sustainability. The emphasis on the concept of

the school according to the data has a potential to greatly contribute to students' awareness given that they started the course with interest but a low level of knowledge.

- Iyer-Raniga et al. (2010) investigate students' awareness of the importance of sustainability education in their working lives after they took a compulsory course or module in Research and Sustainability. The course or module relates to the BE and the construction industry. From a pre- and post-survey, the study showed a marginal improvement in students' understanding of specific terms and concepts. The authors argued that the factors contributed to this finding is due to the fact that the course or module is an isolated, separate unit and only comprises a small component of the whole programme.
- Dent and Dalton (2010) assessed the current state of knowledge and understanding of climate change issues of recent graduates from 23 programmes in the UK. Even though most university course documents include reference to sustainability and the effects of climate change, the message received through a questionnaire survey is mixed. 50 percent of graduates considered that there was no or little reference to the issue in their programmes. From the results, they postulated that it is generally 'business as usual' where programme tend to see sustainability as a topic to refer to but not something that underpins the whole structure of the programme.
- Cotgrave and Kokkarinen (2011) developed a curriculum design model and used a small-scale simulation (one-week long project) to assess the validity of the model. They assert that if there were changes, then the impact of the implementation of the model in the curriculum would be much more significant. They adopted a mixed method methodology to assess the model: pre-, mid- and post-test, and individual essays. Findings illustrated that even though the increase in knowledge was not as significant

as expected however attitudes had changed significantly and positively. The study thus supports the inclusion of the subject earlier on in the curriculum.

- Lim et al. (2015) assessed students' perceptions on the effectiveness and comprehensiveness of sustainability embedment in the Construction Management course and evaluated the usefulness of such embedment for students' future career through a questionnaire survey. The course incorporated reasonable amount of sustainability components into the existing course structure and also cover a comparatively broad and balanced structure of sustainability categories. The survey on students' perceptions revealed that the embedment is not only increased their understanding but also helps in their future career.

These studies show mix outcomes from a few different approaches where some did show significant positive results. One of the reasons for the positive outcome would be the integration of sustainability aspects into the curriculum (Cotgrave and Kokkarinen, 2011; Cowling et al., 2007; Lim et al., 2015). Through this approach, students' understanding increases and they could recognise the importance of sustainability. Moreover, even from just one-week exposure (for testing the curriculum model), there has been a significant and positive change in students' attitudes towards the concept (Cotgrave and Kokkarinen, 2011). These three studies have shown the advantages of underpinning sustainability aspects throughout the whole structure of the educational programme as one-off independent sustainability module by Iyer-Raniga et al. (2010) showed a limited exposure thus students could not see it as necessary. Some scholars assert that there is no consensus among universities on content, learning and delivery approaches of sustainability in construction curricula (Bhattacharjee et al., 2012; Wang, 2009). Holdsworth (2010) argues that even though there are only a few that manage to provide a lasting and positive implementation, some universities do show their commitment to sustainability. The rationale for embedding sustainability in construction degree programmes emanates mainly

from the growing impetus to improve the environmental performance of the construction industry. Therefore, as the BE educational discipline is fundamentally based on practice-led, what would be the current engagement and implementation of sustainability in the practice of the BE sector in general and construction industry specifically? As noted by Kopnina and Meijers (2014), there will likely be a gap between what an individual gained during professional education and how it is going to motivate change behaviour when it comes to facing sustainability issues. In this regards, the next section discusses issues faced by the BE professionals in the delivery of sustainability, and potential areas in contributing towards sustainability.

2.5 Issues and Potential Areas in the Delivery of Sustainability Practices by the BE Professionals

2.5.1 Issues with Sustainability Practices

Apart from inadequate data and information available in relation to sustainability, Shi (2008) also suggests that BE professionals do not have sufficient experience, training or background in sustainability to implement sustainable solutions. Chong et al., (2009) argued that the BE professionals are still not familiar with many established industrial sustainability practices and they are also inactive in professional development. The authors further added that there are relatively few professionals that practice beyond building environmental assessment schemes (such as LEED). These issues as argued by Koigi (2017) have led these professionals to not being at the forefront in promoting sustainability. These issues might also be the reason why the construction industry to date is still progressing slowly in embracing and engaging sustainability (Hartenberger et al., 2013; Inkoom and Leiringer, 2016). Koigi (2017) also argued that the BE professionals would only wait for such initiatives to be driven by clients or regulation. Due to these issues, sustainability or environmental experts are often brought in to

help to incorporate sustainability elements in a project (Bordass, 2000) as opposed to relying on professionals within the design team for instance.

The growth of regulation and legislation in relation to sustainability have seen many companies worldwide moving towards providing sustainability-related services for their clients (Revell and Blackburn, 2007). Therefore, there will be competitive advantages for BE professionals who can offer such additional services and at the same time creating additional value for their client (Oliver, 1997). They could also raise clients' awareness of sustainability through their improved service offer and provision that proves the business case for sustainability (Dixon et al., 2008). Frei (2010) thus assert the need for professionals in the BE sector to proactively seek out and exploit opportunities that could add values to the clients. Hwang and Tan (2012) echoed this as they posit that involving professionals with understanding, experience and capabilities of sustainability-related aspects can enhance sustainability adoption and implementation in construction projects.

Even though with all these important roles that the BE professionals can contribute (see Section 2.3.1) and what the BE educational programme (see Section 2.4.3) has done to date, a survey study by Maduka et al. (2016) revealed that the UK construction industry in general is promoting sustainability practices and principles but less than it should be. As it is important that the industry is geared up to the sustainability challenges, the authors thus suggest for the industry to identify possible champions or catalysts in ensuring the implementation of sustainability aspects in every construction project. This suggestion had been echoed by Elmualim et al. (2010) in their study on barriers and commitment of facilities managers towards sustainability agenda in their practices. The study also identified the need for the facilities managers championing the cause for sustainability within their organisations. This champion or catalyst is important as Pooley (2016) argue that relying on legislation and regulations alone

to drive change towards sustainability is questionable particularly there have been issues with formal assessment processes (see Section 2.2.4.5). In addition, there is also a tendency in maintaining current practices by the BE actors, and this has become one of the barriers to sustainability adoption (Ahn et al., 2013).

In these regards, du Plessis and Cole (2011) suggest that the most effective factors in a change towards sustainability are through changing the mindset and values of stakeholders. In the 2012 report on DESD, the UN (Wals, 2012) recognised the importance of changes in mindsets, lifestyles and values as increasing challenges in regard to sustainability could no longer be solved solely through technology, policy and legislative. The next section will explore other potential areas that might effectively help accelerate changes toward sustainability.

2.5.2 Potential Areas for more Sustainability Practices

Research on sustainability according to Shepherd et al. (2009) has highlighted the importance of values in understanding people's attitudes and behaviours towards sustainability. du Plessis (2002) identified three categories of enablers towards sustainability that are informed by both human needs and environmental limits. One of the enablers (apart from technological and institutional) is a value system where it refers to stakeholder actions and contribution as drivers towards change. Cotgrave and Kokkarinen (2010) assert that many researchers have stressed the importance of changing the attitudes of future policymakers and leaders towards the environment. Attitude according to Teo and Loosemore (2001) helps in giving priority and structure to an individual in a complex world. The authors also added that attitude could also provide some level of clarity and consistency on how individual explain and interpret objects and situations. Dassah and Nymlyat (2010) argue that one's effort to conserve historic buildings or to preserve non-renewable energy resources, for instance, are derived from what one values and what one considers important. For example, one of the participants from Revell and

Blackburn (2007) study who is an architect had a strong personal belief in the importance of sustainability and attempted to promote environmental options to the clients. The study found that this 'eco-architect' has a much more positive view of the business case for sustainable design than the other architects in the sample. The architect even claimed that many aspects of environmental design in new builds are in fact cost efficient as they reduce the need for expensive air-conditioning and heating systems. From this study, it can be inferred that if a professional believes that every individual has a role and responsibility towards sustainability issues, this value will influence the way he or she practices. Apart from that, the values that an individual professional have will also influence the advice that he or she will offer in regard to the alternatives that will provide greater sustainability benefits in the long-term.

In addition, this value system is also aligned with educational movements proposed by ESD where one of the shifts is from teaching attitudes and values towards encouraging values clarification (Tilbury, 2011). Value clarification as assert by the author is to challenge learners in becoming actively aware of values that have been socially embedded or inherited or even chosen by them. This is because people are not always aware of their values until issues that impinge upon them, most obviously as threats to them, arise (Fellows and Liu, 2008). Fellows and Liu (2008) added that the value structure is likely to be 'threatened' subsequently when there are changes in power structure or when actors' appreciation of project performances develops. Consequently, values that initially determined for the desired performance will change thus diversifying basis on performance evaluations (no more shared or common consensus) (Fellows and Liu, 2008). In this regard, combining engagement of value clarification with critical reflective thinking can provide a powerful tool that can contribute to understanding and make a decision regarding personal and professional response towards sustainability aspects (Tilbury, 2011). These engagements could also help uncover how culture (e.g., social identities and cultural diversity) influences values and beliefs that consequently

ensure that not just individual but collectively (as groups) capable in contributing to sustainability (Tilbury, 2011). This is important because differences in values and beliefs can influence individuals' standpoint on the matter of the environment (Celik et al., 2014).

There has been much attention placed on rationalising behavioural and attitudinal change (Chan and Liang, 2012; Cruickshank and Fenner, 2007). However, there has not been much research on these aspects and as well as the impact of values on sustainability practices in the BE sector and also on its educational discipline as well. How to change stakeholders' attitude and behaviour toward sustainability and embrace it in their daily practice? Nevertheless, research on values and ethics in the BE professional practice context has led towards professionals codes of conduct (Bordass and Leaman 2013; Hill et al. 2013; Mason 2009) i.e. standards of behaviours that to some certain professionals (accredited or licensed professionals) the codes heavily regulate their professionals practices through their professional bodies. Therefore, the codes of conduct are one of the guiding principles of professionals' daily practices.

However, a study by Dixon et al. (2008) revealed that a key driver in driving RICS members to engage with sustainability is legal obligations rather than their motivations and aspirations towards the agenda. In this case, sustainability values applied for project realisation can be unstable as sustainability measures are pursued in order to comply with a legal obligation and oftentimes compliance with legislation (regulations or policies) and because it is ethical (Fellows and Liu, 2008). Fear of losing one's license or credibility could also threaten professionals from thinking outside the box (Chong et al., 2009) and this is further heightened with lack of available information and as well as awareness and capability in relation to sustainability (see Section 2.2.4.4 and 2.5.1). In addition, a study by Chan and Liang (2012) also found that sustainability fails to capture the imagination of stakeholders as a reasonable, moral code of conduct. Moreover, some professionals sometimes feel that sustainability is an

added luxury whereas their perspective on a successful construction project is the ability to complete the project on time, within budget and of sound and expected quality (Opoku and Ahmed, 2014).

These issues, therefore, had led the research towards sociology of professions particularly on the enactment of professionalism by professionals. Professionalism refers to the extent of the professional's identification with his or her profession and accepts its essential values (Roberts, 2005). This area is discussed next.

2.6 Professions and Professionalism

2.6.1 Professions

Part of the reason professions was established is to safeguard the public and to make sure that the members of the profession are well trained and educated (Cartlidge, 2013). There are eight common attributes (a composite list) of a profession (Buchanan, 1983; Carr, 2000; Hall, 1968; Riggs, 1981).

First, according to these scholars, a profession possesses a body of knowledge that is esoteric and distinctive to the professional group. The formation of a professional group or body depended upon the articulation of this distinctive 'competence territory' that members can claim as their exclusive area of expertise and practice. Competency is, therefore, an important professional quality. The content of the knowledge and skills are expected to be expanded over time to suits current and future needs and to keep abreast of changes in practice.

Second, a profession is based on service orientation and a sense of calling. Service orientation or belief in service to the public is the central functions of a profession to those outside of it by providing expert services; giving advice or action, or both. A sense of calling as according to Hall (1968) is a belief that a professional has the personal dedication and lifelong commitment

to his profession and work. Kornhauser (1962: p.1) asserts that this professional value engenders, "the belief that the development and exercise of expertise is worthy of the devotion of a lifetime and carries its own reward".

Third, a professional is required to apply a body of knowledge to a specific context (e.g., the service-related problem of the profession) to obtain a predictable outcome or decision to those he or she serves.

Fourth, to acquire a specialised body of knowledge and skills, members of a profession engage in formal education and training for an extended period. The period enables the possession of a degree to claim expertise in a particular field of knowledge.

Fifth, through professional group or body, members will develop a collective consciousness. The governing body aimed to promote the communication of its knowledge and culture among the members. The role of the body is also to regulate the number of its members through sets entry-requirements (controlled admissions). The professional body also defines educational standards, licensing, and area of jurisdiction.

Sixth, to be and to maintain as a professional, there is a requirement for a continual update of knowledge and skills, and professional qualifications in order to provide service.

Seventh, professional practices are measurable against defined codes of ethics and professional conduct. Professionals are obligated to give honest advice and put the interest of their client over their own (McDowell, 1990). Codes of ethics outlined social norms or the proper practice that must be adhered by individual professional and as well as their organisation or institution. Thus, these codes help in forming a set of standards that need to be followed by every certified professional in their workplace and within their practice. The codes are also representing what is expected of them in those environments in order to protect their organisation and also to

protect the public at large. The codes of ethics outline the shared core values of the profession and its members and also provide a framework for assessment in their work (Mansfield, 2008). The author added that standards from the professional body are assisting practitioners by ensuring consistency in developing an approach that often incorporates difficult choices.

Eight, by virtue of their knowledge and expertise, members of a profession are permitted to operate fairly independently (autonomy). Professionals must be able to exercise autonomous thought, discretion, and independent judgement in order to make appropriate decisions on behalf of a client in terms of principles, theories or propositions. Sometimes, they have to make decisions in the face of complex and often unstable circumstances with incomplete information at times. To operate fairly independently, it also means being free of most forms of direct supervision and also free of being influenced by external pressures (from clients or employers) as well (Hall, 1968).

These attributes could be distinguished into two types of professionalism: structural and attitudinal attributes (Hall, 1968). The structural attributes include the creation of a full-time occupation, the formation of professional associations and codes of ethics, and the establishment of a training school (Wilensky, 1964). The attitudinal attributes comprise a belief in service to the public, a sense of calling to the field, a belief in autonomy and self-regulation, and the use of the professional organisation as a major referent (Hall, 1968). These attributes, according to Hall (1968), are important in distinguishing professions from other occupations. These sets of criteria also represent the differentiation of professionals who practice within and outside of the organised professions or regulated enterprise. However, this does not mean that these attributes are only exclusive to the organised professions and their members because according to Greenwood (1957), others who are not part of that profession might also hold the same characteristics but only to a lesser degree.

Thus, highlighting the core value of a professional body and its members that set them apart from others who do not belong to any (Mayer, 1988). These licensed or certified professionals are thus subjected to the highest standard of care in their practices. They are governed and regulated by their professional body through the code of ethics or code of conduct as previously discussed. In this regards, the trust in these professionals is placed on the presumption that the service provided will be of benefit to the client and the public (Matthew, 2014).

2.6.2 Professionalism

The core values of professionalism include competencies, responsibility and willingness to serve the public interest (Chalkley, 1990). There are, however, many different and even contradictory interpretations of the concept of professionalism in the sociological literature (Evetts, 2003). One central feature of the definitions of professionalism shared by building professionals is the acquisition of honour, status, and power from their social contract with society through the use of their distinct knowledge and skills (Chan et al., 2007). The authors also argue that the solid foundation of this professionalism is built upon trust and respect granted by the general public. In addition, Hamilton (2008) suggests that, in its common meaning, professionalism is used to describe the aspirations, conduct and qualities that mark a professional person that also represent the important elements of 'ethical professional identity' (EPI). EPI, according to the author, capture the correlative duties of the profession's social contract for both the individual professional and the members of the professional bodies. A high degree of professionalism builds confidence in the social contract (Hamilton, 2008). Chamberlin (2002) and Stevens et al. (2008) accorded that PI contains both aspects of individual identity: as a professional and the institution that granted membership in a particular professional role.

The concept of professionalism is very important in the construction industry as the instinct of decision making is the pride of professionalism (Alfred, 2007). However, the evaluation of professionalism among building professionals by Chan et al. (2007) revealed that the concept varies across qualified building professionals. The study also found that there is a lack of essential elements of professionalism among the respondents, particularly on the belief in public service and sense of calling. This sense of calling as described by Jos Kole and de Ruyter (2009: p.138) is "an attitude of other-regardingness towards the people one serves and commitment to the social goods delivered by one's professional practice (in other words, a joint professional morality)".

Foxell (2003) argued that a powerful cult of managerialism had replaced the concept of public service. The author added that the Restrictive Trade Practice Act of 1982 that outlawed mandatory fee scales had severed the old value of public service, among others. Through this act, professionals could bid competitively for work, and this has put power in the clients' hand where can drive down professional fees through competition. With the lower fee, there will not be enough money for the professionals to undertake their traditional role. Hence, they had to cut back the services that they would offer. Therefore, from this point on, they had to serve those who paid them and could no longer subscribe to the notion of public service. The reward systems are eventually displacing the ideals of professionalism despite any grand statements of the profession about impartiality and public service.

Hanlon (1994) also confirmed the commercial ethos that has shaped and controlled professional service firms, i.e. uninhibited by the need to pay lip-service to the public interest. The author is also adding that due to the commercial aspect, business emphasises more on pleasing and retaining clients as, the primary aim is now the client's service as opposed to public service. Therefore, the professional self or the ideal of professional attributes drawn from the

‘traditional’ language of the profession is being trapped in the strict business competencies (Kosmala and Herrbach, 2006). As a result, the organisation and as well as professionals can get locked into ways of doing things (and routines) that may result in unethical action and behaviour.

These issues and discourses thus lead back to the attitudinal attributes of a professional and PI (that relates to the aspect of personhood). PI as asserted by Jos Kole and de Ruyter (2009) refers to the generic characteristics of professionalism. As part of the professional model, attitudes serve as values to guide, and to express professionals’ self-identity (Teo and Loosemore, 2001). According to Teo and Loosemore (2001), these values and identity attributes determine the directions of behaviour in response to a particular stimulus (e.g., issues of sustainability for instance) and provide insights into an appropriate motivating mechanism. In this regards, the PI concept and its related aspects are discussed next.

2.7 Professional Identity

2.7.1 Professional Identity

Professional identity (PI) is ‘the sense of being a professional’ (Paterson et al., 2002: p.926). Ibarra (1999) defined a PI as an individual's self-definition as a member of a profession and is associated with the enactment of a professional role. There are a number of other PI definitions in the literature. The different meanings, according to Wiles (2013) have something to offer, and one of them is providing sources for individuals as they construct themselves to be part of a particular profession. The author argued that PI is more complicated than adopting certain traits or values or even demonstrating competence (Wiles, 2013), highlighting the dynamic nature of the concept. Based on a study by Jebril (2008) from a multidisciplinary literature review, the author identified that there is no apparent consensus on the definitions. Therefore,

based on the analysis and articulation of the PI definitions within the literature, the author defined PI as follows:

"Professional identity refers to an ongoing adaptive learning and evolving developmental process of identification with a profession, during which an interaction of profession traits, defining factors, socio-cultural influences, personality characteristics, personal abilities and preferences, within the environmental contexts, determines one's professional self, as well as, the extent of individual's perception of his or her professional self and the level of integration of professional self, profession and professional values and characteristics into one's behaviour. The level of integration is reflected in one's commitment, and attitude toward his or her profession" (Jebril, 2008: p.53).

From this definition, there are a number of key elements associated with PI and some of them are overlapping between the profession and professional attributes. These elements are: PI is a self-sense making process (individual developmental process), conveying the identity of the profession (a sense of shared identity), and desired traits.

i. Self-sense making process

Through a literature study, some of the concepts emerged in relation to PI are on personal dimensions such as self-formation; 'Who do I want to become?' (Fagermoen, 1997), self-conception (Gibson, 2003; Ibarra, 1999), self-authorship (Edwards, 2014), and self-reflection (Eliot and Turns, 2011; Tsui, 2007). The role of self is being discussed as a crucial part of the process of PI formation and development. This finding is also supported by the review of the higher education literature on the PI development by Trede et al. (2012); it is a self-conception of what it means to be and to act as a professional. It is an individual and personal journey in identifying oneself as a professional. The PI concept also has a direct linkage to the

professionals' everyday practices (Fagermoen, 1997). Ohlen and Segesten (1998) suggested that as a consequence of the personal dimension, there will be an increase in positive and realistic self-image and professional pride. Thus, PI, according to them will appear on a maturity continuum and develops along with personality and maturity and this view is also supported by other authors such as Brott and Myers (1999).

ii. Desirable traits and identity of the profession

PI involves the internalisation of the profession's values and norms as part of an individual's behaviour and self-concept (Adams et al., 2006). According to Low et al. (2012), PI is an abstract term. They posited that PI is best described as "a bundle of desirable attributes that give a professional body its status and standing in society" (Low et al., 2012: p.32). These desirable characteristics also encompass individual professional as well, with his or her personal and professional traits. Sociologists argued that all professional groups share certain traits (Wiles, 2013), and these traits are discussed in Section 2.6.1. The author reasoned that the discourse of professionalism based on qualities and traits are used by students to construct their PI. Ibarra (1999) contended that qualities are a persona that an individual wants others to describe them. As a professional, the qualities prescribed by their professional roles are independent judgement, competent, trustworthy, and creative, to name a few. According to Ibarra (1999), some of these traits might be well-defined within an individual identity, and others will be elaborated with experience. Traits is also seen as a mark of professionalism or professional attitudes (Wiles, 2013).

In addition, elements of professionalism as suggested by Paterson et al. (2002) must be combined with the sense of being a professional in order to ensure that PI development can occur. Trede (2012) insisted that PI informs professionalism and professionalism according to the author is the need to be seen as a having a responsibility to make judgements and decisions,

and also taking responsibility for one's action in the context of the practice. Fish and de Cossart (2006) developed a practice model that links professionalism to professional values and PI as the fundamental forces that guide decision making and professional judgement. Therefore, professionalism or professional attitudes are seen as a framework used by professionals in identifying their work in a social role context (Fagermoen, 1997). In this regards, Jos Kole and de Ruyter (2009) argued that professional calling (and ideals) only make sense with such personal identification.

Jos Kole and de Ruyter (2009) also added that personal ideals constitute personal identity and professional ideals are (partially) constitutive of professional group identity. Therefore, they concluded that being a professional means that one commits oneself freely to the mores and ideals of a group (in a personal and unique way); one's identity is thereby also collectively defined. This collective identity stemmed from the socialisation process; social relationships and from participating in social groups (Brewer, 2001; Kogan, 2000). It is part of human nature where people are highly adapted to being with others and living in groups. Billett (2006) stated that how people decided to present and identify themselves (in what social groups and in which practices) is part of one's identity. People construct their social selves through their everyday life and realities. Cornelissen and Van Wyk (2007) explored professional self-image through the professional socialisation process. They found that involvement in preparation for a professional role, or participation in the role is key for students to gain insights into professional norms, values, and attitudes. These insights (identification with the profession), according to the authors, shaped PI.

Therefore, through these assertions, the socialisation process and specifically, professional socialisation process is discussed next.

2.7.2 Professional Socialisation

The significance of professional socialisation as argued by Jackson (2016), and Loseke and Cahill (1986) has consistently been acknowledged as a crucial factor in the formation of identity. Professional socialisation is the process through which individuals learn the values, attitudes and beliefs of their chosen profession and develop a commitment to a professional career (Vollmer and Mills, 1966). According to Cohen (1981: p.135), professional socialisation can be defined as "the complex process by which a person acquires the knowledge, skills, and sense of occupational identity, characteristic of members of a profession It involves the internalisation of the values and norms of the group into the person's behaviour and self-conception". Abbott (1988: p.31) defined it as: "That process through which individuals are influenced or moulded to assimilate and reflect the value dimensions of a given profession". There are several other definitions of professional socialisation which exist in the literature. Within the three descriptions, the key aspects are identified, and that included an active pursuit of learning and acquiring competence in practical skills. It also involved the element of personifying values and norms, a change in behaviour (by a change in values), as well as the development of self-concept, i.e. occupational or PI.

From the definitions above, professional socialisation is a process or a learning journey. According to Richardson (1999), it is an ongoing development of an individual through interaction with his or her surroundings. The interaction is often between individual personal experiences with the social, cultural and workplace environments in which he or she engages. Hunter et al. (2007:p.67) echoed this as they stated that, "Identity development and professional socialisation are framed as a process of negotiated meaning-making within a community of practice". The community of practice as framed by Weidman et al. (2001) can be from personal

communities (family, friends, and employers) or professional communities (practitioners and institutions) or overlap between the two.

Page (2005) and MacIntosh (2003) stated that higher education is where an individual starts the process of professional socialisation. Cornelissen and Van Wyk (2007: p.840) inferred that professional socialisation is "a dynamic, interactive and lifelong process that starts as soon as the student decides on a career". Career decision, as suggested by Cohen-Scali (2003) can start as early as childhood. Cardoso et al. (2014) also postulated that professional socialisation is a learning journey that is often initiates before the individual enters a particular profession. It begins with social and family influences, intelligence or natural selection that increases in the university and continues to develop following graduation. Therefore, when does this professional socialisation process start? A number of scholars argued that professional socialisation is both an individual and enculturation process (Ajjawi & Higgs, 2008; Clark, 1997). Thus, it is evident that the first initiation process might be different between individuals. Some may start as early as during their childhood, and to some others, it may start later in their adolescence life. Cohen-Scali (2003) identified two dimensions of PI construction. The author provided helpful distinctions of professional socialisation process: socialisation for work and socialisation by work. These two dimensions are discussed next.

2.7.2.1 PI Construction through Socialisation for Work

Socialisation for work concerns with the acquiring of cognitive, values, and attitudes before an individual enters the world of work (Cohen-Scali, 2003). The process as has been previously discussed, can start as early as childhood (Cohen-Scali, 2003), or as soon as student decides on a career (Cornelissen and Van Wyk, 2007), or in higher education (MacIntosh, 2003:p.2005), or before an individual enters into a particular profession (Cardoso et al., 2014). Therefore, from these suggestions, it can be postulated that socialisation for work occurs in different forms

and time. Cohen-Scali (2003) stated that PI through socialisation for work begins to develop from childhood, particularly as an adolescent. According to the author, the first development occurs in the family, and the second one takes place in school.

i. The role of experience in the family and social circles

As has been previously discussed in Section 2.7.2, professional socialisation is associated with an individual and a profession (career or future career). The process started when an individual decides on his or her career (Cornelissen and Van Wyk, 2007). Many factors might influence career decisions such as interest, family, media, own personality or a better opportunity. Two perspectives were derived from prominent theories in relation to studies on career choice (Ekung and Okonkwo, 2015). These perspectives included the fact that first, the career is chosen based on personal enthusiasm, and the second one is it is being imposed due to the influence from people who are usually superior in position. It may be imperative to take into consideration that a particular individual may have limited decision-making abilities due to their lack of knowledge and life experience and experience in the profession. Due to these, their decision might be based on other decision and opinions, or based on their role model (Gibson, 2003; Ibarra, 1999).

Family or parental influence is widely acknowledged as one of the most influential factors in career choice in the literature according to Kniveton (2004). A study by the author also revealed that schoolteachers or career teachers or advisors have far less influence compared to parents. A study by Millward et al. (2006) on young people's job perceptions and preferences found that a decision to study or to pursue a career in a construction-related industry are both influenced by family members who are either working or have their own business in the industry. As echoed by Cohen-Scali (2003), a child learns a few things about his or her parents' occupations.

The child also learns the name of different professions through family and socialisation for work.

When the child when to school, he or she gets to learn more, and about different professions as well. Schwartz (2005) maintained that identity development, is first envisioned and undertaken during early and middle adolescence. Cohen-Scali (2003) also stated that this is the stage where active exploration starts. This is the stage where some of the adolescents started to think about the self and the future. The searching phase continues until an individual finds a profession that is a good fit with his or her personalities, preferences and abilities (Jebril, 2008).

To individuals who had this active exploration and maybe even found a 'suitable' profession, they might enter higher education or professional education programme with preconceived ideas about their future profession. Their interests and motivation might affect their efforts in preparing to learn and to work. Interests, according to Lent et al. (1994) promote career-related activity involvement and skill acquisition. To those who are still looking for a suitable profession, learning and exploration will continue at college, university or higher education.

ii. Higher Education or Professional Education Programme

Professional education has a history of preparing students for jobs in a particular profession. According to Bebeau (2002), it helps students in understanding the fundamental of their discipline. Shulman (2005) argued that professional education is not about understanding alone. It is a "preparation for accomplished and responsible practice in the service of others. It is the preparation for 'good work'" (Shulman, 2005: p.53). The author also characterises professional education as a combination of three apprenticeships (Peel, 2011). They are cognitive (where one learns to think like a professional), practical (learn to perform like a professional), and moral (learn to think and act responsibly and ethically). Therefore, it is essential that

professional education prepares future professionals with the ability to make sound, ethical and technological appropriate decisions on behalf of the community (Sullivan and Rosin, 2008).

The graduate socialisation framework proposed by Weidman et al. (2001) suggests that students develop a PI through an extensive socialisation process. Higher education, university or a professional school can be seen as an open social system. According to Cornelissen and Van Wyk (2007), higher education is an anticipatory professional socialisation stage where it covers preparatory and recruitment phases, i.e. a training stage for an opportunity to be part of a profession and transforming individuals from non-specialists to novice professionals. DeVault (1999) described it as a formal education where it is a site for students to be educated and socialised into established paradigms, gain competencies associated with the field, and start to develop an identity as practitioners of a profession with its traditions. Cohen (1981) reiterated a similar opinion that this stage is the initial introduction to a profession through which an individual will acquire attributes similar to the profession that include knowledge, skills, attitudes and values. These characteristics, according to Jung (2010), will enable the students to play active roles within their profession and as well as within society.

From the review of the literature on professional socialisation, Page (2005) stressed the importance of universities or higher education as they have a role in socialisation work that has a long reaching impact on a professionals' career. According to Shulman (2005: p.53), professional education is a "preparation for accomplished and responsible practice in the service of others" and education that balances and "giving adequate attention to all dimensions of practice – the intellectual, the technical, and the moral" (p.58). Therefore, apart from intellectual and technical dimensions, students will also be exposed to different communities of practice such as learning communities and professional communities that have a particular set of boundaries and traditions that will affect students' preparation for their future work. While

taking part in learning activities, the individual student will socialise with fellow students and experts (academics). Students will also socialise with other experts, i.e. practitioners through exposure to work (internship and industry or work placement).

Jackson (2016) posited that the contemporary notion of employability is associated with the construction of the PI. The identity will assist students in demonstrating preparedness for employment and successfully applying their acquired skills and knowledge in the world of work as novice professionals (Jackson, 2016). Students will form their own PI as it cannot be forced onto them. The educational setting can only facilitate, steer and motivate students in the intended direction (Trede, 2012). PI is not static and cannot be accomplished entirely and set in concrete during professional preparation. The construction process, according to Jackson (2016), will continue to emerge even if somewhat haphazardly. Through participation in the educational process, Ji and Rowlinson (2010) argued that that rather than 'lumps of clay' to be shaped by the faculty, the student is actively taking part in constructing meanings and developing themselves. Hunter et al., (2007) argued that developing PI is up to the students as they need to take ownership, engage in the process, act professionally, and thus build up their professional confidence.

Even though the mainstream educational institution is considered as an ideal space to nurture PI, findings from a study by Nichol and Williams (2014) on the perceptions of human resource professionals on their PI suggested that the major players in the development of PI are mentor and workplace interactions. West and Chur-Hansen (2004) also claimed that workplaces strongly shape PI development and not the university, yet others contested this (Mieg, 2008). How do these findings reflect on the role of professional education? As previously discussed, PI is an evolving process and can change over time depending on the context and circumstances

(Fagermoen, 1997; Jebril, 2008). In this instance, it is also interesting to know what will be the impact of having and not having a robust pre-PI upon entering the world of practice.

In summary, this socialisation for work stage represents the springboard for socialisation by work; preparing the student to assume the role in their chosen profession. As claimed by Reid and Solomonides (2007), students' potential future profession can contribute to their sense of being; of being part of that profession. It will continue to develop and evolve through professional practice and the interdependence of workplace cultures, practice traditions, policies, experiences and personal perceptions, interpretations and worldviews. As a result, an individual's duties, roles and responsibilities will reflect upon one's own common as well as specific experiences.

2.7.2.2 PI Construction through Socialisation by Work

Socialisation by work is a stage where an individual is in a position to experience the role as an incumbent of the profession (Cornelissen and Van Wyk, 2007). It also allows individuals to learn and practice the behavioural expectations of their new professional roles (Caza and Creary, 2016). This stage occurs when graduates embark upon their career and build upon what they have gained during the socialisation for work. This stage is also known as organisational socialisation defined by Tierney and Rhoads (1993: p.21) as a "ritualised process that involves the transmission of culture". The transmission is through a mutually adaptive process between the organisation and the individuals. Therefore, workplaces, as suggested by Sommerlad (2007), are the 'crucibles' of identity formation. Newcomers' practices (both technical and cultural) are modelled by the master, trained and taught about what is important in an organisation and suitable for the image of the firm. The identity that graduates may have formed in university or during professional education (socialisation for work) will continue to develop as the process of learning continues. The identity might also be reformed or remade by the

workplace as well. This happened when what students learnt at universities are being undermined by what they observed at work (West and Chur-Hansen, 2004). From their study, West and Chur-Hansen (2004) found that when medical practitioners started working, those practitioners quickly unlearnt what they had been exposed to at university and the authors thus argued that education needs to focus more on action and practice.

In addition, as a beginner, a novice is learning by becoming assimilated into an existing community of practice (Hodkinson et al., 2000). They will observe the activities of role incumbents and thus learn about normative role expectations and how they are carried out. They will gradually adopt professional values and norms through a socialisation process. Ajjawi and Higgs (2008) highlighted this as well when they acknowledged that professional socialisation is based on the learning of the profession's socially constructed norms, values and beliefs. This learning happened through interaction within the workplace and cultural situations. According to Webb (2015), it is through the workplace cultures of socialisation that PIs are partly developed. Other scholars also stated that through the process of socialisation, an individual would adopt attributes from within his or her profession hence evolving their PI (Beijaard et al., 2004; De Ruyter and Conroy, 2002; Sachs, 2001).

According to Ajjawi and Higgs (2008), socialisation is not limited to the technical and interpersonal skills associated with being professional, but also includes learning other skills required by the nature of the role and the profession such as critical thinking, decision making and problem-solving skills to name a few. From a social identity perspective, according to Caza and Creary (2016), socialisation provides a basis for attachment to one's new professional group, and this is reinforced with social ties among the group members. Socialisation into the professional community may provide a sense of belonging and stability (Hoth, 2008). Therefore, through this socialisation process or learning the ropes process, novice practitioners

are leading towards role acquisition, identification and commitment to the profession and professional role.

According to Jackson (2016), professional practitioners also support the landscape of practice as a valuable context for learning. The learning process includes acquiring and sharing technical knowledge and cultivating generic skills. Professionals' understanding of the powerful influence on learning, of the workplace culture according to Abrandt Dahlgren et al. (2004) enabled them to adopt a critical and reflective stance about the activities of their workplaces. The understanding will also encourage them to be strategic in their learning and development. Therefore, becoming professionals does not necessarily mean that they can stop learning, as Clark (1997) asserted that socialisation is generally been viewed as a developmental process. A continual interaction will occur between the individual being socialised and the environment (institutions or other individuals) which will then lead to the construction of professional identity (Clark, 1997).

In addition, the research on professional identification suggested that socialisation practices (among others) have a significant effect on how strongly individuals identify with their profession (Caza and Creary, 2016). Evetts (2006) argued that, through occupational or professional socialisation, a shared PI can be developed, maintain, produced and reproduced in workers. This shared PI, according to the author, is associated with a sense of shared understandings and expertise, shared ways of perceiving problems and their possible solutions. Through occupational or professional socialisation, this collective identity can be developed by means of common and shared educational background, training and experiences, by the membership of professional institution, and community of practice (shared work culture).

In summary, from what has been discussed so far, it is evident that there are substantive researches on socialisation theory. Some of the research describe how socialisation shapes the professionals' ways of being and learning through validating specific knowledge, practices and attitudes as the norm (Hunter et al., 2007; Viskovic, 2006). How an individual understands PI is dependent on circumstances (influenced by many factors) and it can evolve over time. Therefore, PI is not just something that is obtained right after completing education and gaining a certification or handed out by professional institutions fully cooked (Hughes and Hughes, 2013); it is an evolving and localised process. It is localised as personal history, social interactions and psychological and cultural factors which undoubtedly influence identity formation (Clarke et al., 2013). From the literature, it is recognised that identity changes accompany context changes and this finding is also echoed by Ibarra (1999). PI is one of the multiple subjectivities that a person occupies across their day-to-day lives. Therefore, it is hard to imagine that a person practising a professional field does not have a P. The issue here is how conscious, and decisively individual professionals choose their particular identity and how they enact the identity within their everyday work and practice. Another issue would be how their professional body helps and shapes their PI.

2.7.3 Professional Identity in the Built Environment Sector

From the review of current literature, the researcher only identified one specific literature of PI in the BE sector which was a study conducted by Hartenberger et al. (2013). Their study focused on a shared PI where it is considered as a prerequisite for successful integration of sustainable development principles into the sector's value chain. A shared PI could also help in overcoming the level of fragmentation within the sector and amongst its professionals through a shared sense of purpose.

There are a few other kinds of literature that briefly mentioned the concept, for example, in Friedman and Phillips (2004). Their study focused on the ambiguous concept of Continuing Professional Development (CPD); professionals' thoughts on the concept, definition and value of CPD. Findings revealed that CPD, according to the study respondents, is an obligation which is something that they 'just do' and not to form their 'PI'. These participants' limited views of CPD are different from what their professional associations claim it to be. It can be assumed from this finding that these professionals are choosing to view it as a low priority in their working life and not connected to the ideals of professionalism and their associations (as their interpretations are different).

Another research is by Alfred (2007), where the study aimed at identifying ethical perceptions of practising Quantity Surveyors (QSs) across levels of professional status. The study discovered differing views from new entrants (practice own up to self-interest) and senior members (always consider public interest). The difference according to the author is due to the fact that the new entrants have not fully developed a full sense of their PI yet. The older members, on the other hand, have powerful will to operate at the highest level of professionalism with an excellent understanding of the industry.

Gluch (2007 and 2009) studies aimed to understand how environmental aspects are communicated in construction projects and focused on the role and positioning of the environmental professionals. The results showed that, among others, their fuzzy PI and status are part of the hindering factors in communicating (meaning creating process) the environmental issues. The study thus recognised four interrelated aspects that need to be considered, and one of them is PI. This study is, therefore, highlighting the importance of PI and status in the effective delivery of professional roles.

Brown and Phua (2011) examined identity concerns related to construction managers through literature investigation. Their study intends to explore ideas and to raise the issue and the importance of identity. The authors thus suggested how study about identity can provide further understanding of individual, group and organisation experiences and to appreciate issues linked to cultural and political irrationalities. A study on identity could also provide a better understanding of the processes of organising and as well as organisational lives.

Lowstedt and Raisanen (2014) explored work identity and processes of identification at micro-level large construction company through a lens of social identity and self-reinforcement theories. The results identified a robust collective identification is self-defined. Thus, it suggested that self-defining at the individual and group levels has implications for organisational performance and outcomes. The results also suggested that the use of a social identity can help increase understanding of interpersonal relations, collaboration and change initiatives in the construction industry.

The literature study revealed that the PI concept is not a familiar concept and is rarely used within the sector. Apart from PI, the concept of identity and professionalism are also being used in research related to professional issues. It can be concluded that the concept of PI is still underexplored in the BE sector even though there has been evidence of the importance of it to the students' professional role and practice. This outcome thus motivates this study.

2.8 Sustainability and Professional Identity

There are not many works of literature associated PI with sustainability. Below are some of the papers identified:

- Mikkola (2009) explored how Finnish public caterers use their position and productive intelligence in promoting a sustainable food system within their contextual networks. Using semi-structured in-depth interviews, the study revealed that while accepting their responsibility (to a varying extent), a more or less committed PI for sustainability is also evident in cases when the quest for sustainability is part of the organisational strategies. PI for sustainability acted as a social force, and the article crystallises the 'agency for sustainability' as PI for sustainability. The shaping of PI for sustainability, as highlighted by the researcher could serve as a co-operative platform for future development towards more sustainable food systems.
- Dunphy (2013) investigated health care practitioners' key obstacles to supporting environmental sustainability. Using semi-structured interviews, the author discovered that a substantial barrier is the economic rationalism of the sector. Fear of conflict and ostracism and the feeling of being seen as unqualified by other professionals are also part of the barriers as well. These have led the professionals to make inconsistent moral judgements and the feeling of being silenced and powerless. Those who take action to protect the environment do this often through their personal rather than professional capacity, particularly the ones with strong PIs. The study highlighted a disparity between personal and professional actions to address environmental sustainability.

- Grace and Trede (2013) explored how lecturers and students in physiotherapy and dietetics understood, experienced and talked about professionalism. Professionalism, as asserted by Fish and de Cossart (2006), is linked to professional values and identity.

They are key forces that guide professional judgement and decision making. Through focus groups, the study identified that participants understood professionalism to be a multifaceted concept. The concept, however, did not appear to encompass leadership, multidisciplinary teams working, cultural competence and environmental sustainability. The authors posited that these aspects can encourage adaptability and readiness for emerging trends in professional practice. Thus, in terms of environmental sustainability, the concept is not part of participants' understanding of professionalism and consequently, their PI. The findings thus suggested a need to rethink philosophical approaches and pedagogical strategies to develop a notion of professionalism that adequately prepares students for the demands of contemporary professional practice.

- Hartenberger et al. (2013) asserted that a shared cross-PI is a prerequisite in order to successfully integrate the principles of sustainable development along the BE value chain. A shared identity, according to the authors, could support a shared goal. However, a comparison with medical profession revealed a distinct lack of a BE PI that consequently make it harder for the stakeholders to adopt a collective whole life-cycle approach as some of them might not have the same goal. The study thus posited that more work to be done in achieving a shared PI for the BE; through effective cross-organisational collaboration and alignment of goals. The study also suggested some measures to be adopted by educational institutions and professional organisations to help shape a BE PI in order for sustainability to be an integral part of practice rather than just an add-on.
- Schweber (2013) used interview data to explore the effect of BREEAM on PI, among others. Although all of the interviewees are the main actors who are directly involved in the assessment process, none of them mentioned BREEAM performance in their presentation of self. The author asserted that the method is an important element in

contributing to the internalisation standards of good practice. However, with some issues related to it, the author posited that it is difficult to state that BREEAM has transformed PI or standards.

- Pedersen (2016) examined how collaborative peer learning through communities of practice approach can promote and sustain continued professional development in education for sustainability for HE staffs. The data was gained through a series of semi-structured interviews and focus groups. How did participation impact on participants' PI? The participation strengthened their experiences in their fulfilling their roles and helped them develop and maintain their PI. Participants noted that it was their value that had driven their engagement with sustainability.

From the list above, even though there are disparities in the findings and not many works of literature can be associated with these two concepts, there are however, considerable research that linked sustainability with identity. Diamond and Irwin (2013) stated that identity development involved the consolidation of personal values and identity that are aligned with achieving sustainability. A study by Gatersleben et al. (2014) revealed that values and identities are good predictors of pro-environmental behaviour. In particular, the author asserts that factors which are essential to the self, are likely to influence behaviour across contexts and situations. Podger et al. (2010: p.341) described the notion of identity as "who we are, how we relate to others, what our purpose is as individuals and as a society". Myers Jr. and Beringer (2010: p.58) describe identity as something that "pertains to our beliefs or self-concepts about who we are". Identity is thus a set of beliefs and a motivator for a way of acting in the world.

Medrick (2010) theorised that nature is a source of identity as can be seen in living beings. Individual identity gradually forms as one matures through personal development and influenced by family, community and surroundings (Hay, 2010). Identity is thus located in an

individual and as well as in the culture. In this instance, Hay (2010) argued that when one is living within places that collectively becomes less sustainable, this, therefore, has a consequence of one's identity. Therefore, a commitment to take action is crucial, and a commitment to calls for sustainability for specific competencies (De Haan, 2006) as described in Section 2.4.3 is equally fundamental. Identity, according to Myers Jr. and Beringer (2010), is needed to provide the motivating force for the use of those competencies.

Wright et al. (2012) underlined the politicised and reciprocal relationships between climate change and identity work. The authors added that climate change has threatened not only social, economic and physical well-being but also individuals' identities. It challenges the understanding of human self as an individual as well as a species within a broader ecosystem. Therefore, they argued that, until the work identity of enough people is linked to the issue, there would unlikely be any emergence of a broader social movement. In this regards, this research investigates the PI of QS professionals in relation to sustainability. The reasons why researcher decided to study this particular profession are discussed next.

2.9 Quantity Surveying Profession and Professionals

2.9.1 The Profession and Professionals

The quantity surveyor (QS) is also known as a cost consultant and a few more other terms (e.g., construction economist and construction cost engineer to name a few). To those who are not familiar with the construction industry, the term cost consultant is usually more relatable to them than the term 'quantity surveyor'. Those who are unfamiliar with the QS term will mostly ask for elaboration upon hearing the words quantity surveying (QSing). Generally, an understanding of the QSing profession is related to cost. Thus, cost consultant seems to reflect the profession better. However, keeping the project cost on track is only one of the key responsibilities of QS practitioners, and in fact, this is their traditional role.

As described by Cartlidge (2013), parts of the QSs' scope of works are (1) Forecasting costs and value: where the responsibility is to provide accurate and timely cost advice specific to their client throughout a project. (2) Measurement and quantification: even though the demand for the bill of quantities has been declining, it is still vital in assisting with interim payments, valuing variations and the final account preparation. Thus, many would still argue that the ability to measure and quantify materials and to analyse the necessary labour and plant needed for a new project is still the core and sought-after skill of the QSing profession. (3) Procurement: currently, the emphasis has moved from selecting the lowest priced bid to advising the client on awarding it to the contractor who can give the best possible value for money for the client. (4) Pricing and tendering: Pricing a bill of quantities or specifications. (5) Contract procedure, administration and organisation: advising on the type of contract to be used, administering the chosen contract and site organisation (facilities, layout). (6) Final account: calculating and determining the final cost of a project after practically completed.

As the profession evolves parallel to the changes within and outside of the sector and the profession itself, the roles and responsibilities have expanded over the years. As listed above, QS works cover all aspects of not just project cost management but includes contractual and procurement as well (Lee and Hogg, 2009). Modern QSs have taken broader responsibilities. They have been involved in all stages from project inception to construction through commissioning the finished building, i.e. in all stages of the life cycle of a facility. The role has extended beyond the traditional measuring and cost estimating. The emerging roles include dispute resolution, auditing, expert witness and loss adjustment (Ashworth, 2011), and the construction project's financial and contractual administration (Mbachu, 2015). In the UK, some of the QSs also take the role of a project manager and this role has given them more control over a construction project and with this role as well, they can demonstrate greater leadership and lead the project (McGaw, 2007).

In addition, Matipa et al. (2009) maintained that most QS firms could manage all types of projects, including refurbishment and civil works. This is probably due to the QSs generic attributes where they usually handle and manage the project's cost. Thus, they are well positioned and able to work in any projects irrespective of the size, types and complexity (Matipa et al., 2009). In this instance, as a project's cost manager of construction, elements such as transparency and ethical behaviour are essential for QSs. Their day to day activities revolves around the client's money as they have to deal with payments, valuations, and monitoring and controlling the cost of the project. As a person in charge of financial matters, the QSs carries a great responsibility. With their expertise in cost related aspect, they can provide independent advice on that, thus making their role of great importance to their clients and also to the other industry professionals. However, controlling cost is not an easy job as they QSs have to work and cooperate with the other professionals in delivering a project. Sometimes, the other professionals disregard the pre-determined budget and commence and continue their work without the input from the QS. These actions usually lead to a deficiency in the budget, which the QSs have to take responsibility for and are always to blame for not able to control and monitor the cost (McGaw, 2007). One of the reasons is probably that the other professionals do not understand the role of QS.

The increasing emphasis on sustainable construction has placed new and additional responsibilities on the QSing profession. QSs need to consider the driving forces of the sustainable environment in which they operate. They need to be holistic and review the whole aspect of construction in order to provide sustainable solutions. Sustainability is presenting not only new challenges to the profession but also new opportunities as well. Life cycle costing (LCC) and facilities management, in particular, are two services that QSs could provide and specialise in to achieve sustainable building. These aspects are discussed further in Section 2.9.2.

QSing is also a profession that is accredited or affiliated with a self-regulating governing body. In the UK, for instance, the governing body for the QSing profession is the RICS. Even though certification is not always required in the construction industry to work as a QS, some firms or organisations may require their QS employee to be professionally qualified. In other words, to be a member of a specific professional body (Brown and Phua, 2011).

2.9.2 The Roles and Responsibilities of QS in relation to Sustainability

As previously discussed in Section 2.9.1, QSs play an essential role in a construction project. As a project cost consultant, the QSs provide the cost advice and prepare documentation for the procurement process. The QSs also manages costs during the construction phases and making sure that client's requirement for value for money is achieved upon completion (Matipa et al., 2008; Nagalingam et al., 2013). The work begins at the conception stage, where the QS estimates and forecasts the cost of a project. Experienced QSs generally have an excellent understanding of a vast amount of specifications. Therefore, they are well positioned within a project team, particularly in a design team during the initial stage of a project (Kohler and Lutzkendorf, 2002). In this regards, they are also well placed to contribute to sustainability. With the knowledge and understanding, Hiew and Ng (2007) stressed that QSs could create value by playing a pro-active role during the early stage of a project. Nkado and Meyer (2001) argued that QSs could even play a leadership role during this stage and engage the team at the specification and design levels. It is essential to consider the appropriate sustainable design and features early in the project to successfully integrate and adopt the aspects of the project development (Essa and Fortune, 2008; Gibberd, 2001).

Traditionally, the project's cost management approach was generally based on economic aspects (Ekundayo et al., 2011) that responded to market changes (Ashworth et al., 2013). In this traditional approach, the initial design is first estimated then followed by the procurement

process and afterwards the construction phases (Matipa et al., 2008). This approach addressed a short-term view of project costs (Ekundayo et al., 2011). In this case, Ofori and Toor (2012) maintained that the drive towards sustainability offers the opportunity for QSs to go beyond their present focus on cost. The QSs, according to them, can provide leadership in the area of the overall economic viability of constructed items that incorporate the sustainability aspect. They can help develop innovations and technologies for sustainable buildings, and this can only be achieved through skills enhancement. Thus, they also have to adapt to the knowledge of new and emerging technologies that are being utilised in sustainable buildings and constructions (Seah, 2009).

New and emerging technologies such as BIM, for instance, requires the QSs to develop their skill in this technology. This is due to the fact that some of the construction projects require the usage and adoption of BIM (mandated into a project) (Blackburn, 2013). BIM with the incorporation of the New Rules of Measurement (NRM), according to Matipa et al., (2010), can enhance the involvement of QSs in their cost management services. Many scholars believe that embracing the BIM skill set can provide opportunities to enhance, strengthen (Crowley, 2013; Ismail et al., 2016; Kim and Park, 2016; Oladotun and Edosa, 2016) and also have a significant impact for future roles of a QS (Farmer, 2017). BIM might able to expand on the current services offered (Crowley, 2013) and direct the talents that QSs have towards being more efficient which is very crucial with increasing demands for a higher-level skill (Breuer, 2012; Zainon et al., 2018).

According to Kim and Park (2016), BIM adoption can increase the capability in assessing not just financial but also environmental impact simultaneously. These authors also affirmed that construction clients expect QSs to provide their project with value and cost minimisation and as well as achieving sustainability. As such, with the changes in the clients' needs, the QSs'

role will have to keep evolving in order to not just address the needs of their client (Ozorhon et al., 2010) but also to adapt and cater to the changing demands of a changing industry (such as the growing emphasis on sustainability) (Seah, 2009).

Ofori (2006) posited that the role evolves to become client-oriented; it is not just to add value to the client but to meet their business strategies as well. They need to be able to tap and adapt to potential opportunities in new emerging areas in order to remain relevant (Seah, 2009). In this instance and in conjunction with the emergence of new technologies (BIM, cloud computing), the QSs will need to update their cost models in regard to the costs associated with sustainability-related aspects to better inform their clients. This will consequently allow them to offer effective services. Speed and accuracy in providing cost advice during design development and simulation process can provide QSs with massive opportunity to play a vital leading role in sustainability design development (Smith, 2017).

Traditional construction focuses on cost, time and quality objectives while a new sustainability paradigm requires consideration on resource depletion and environmental degradation (Kibert, 1994). The new paradigm entails consideration of sustainability at all stages of a project's lifecycle (Vanegas et al., 1996). As an expert in cost management, the QSs are in an excellent position to manage the field of the project's LCC (Seah, 2009). LCC is a technique to establish the total and real associated costs of the building throughout its functional or anticipated lifespan (Seah, 2009). Therefore, information gained can be used to assist in the decision-making process of adopting sustainability measures in a project and to determine the project's viability during appraisals preparation (Othman, 2007). Green (2015) further maintained that QSs are suitably placed in the design team to pressure the team to consider the whole life matters of a future project that can ultimately result in savings and efficiencies. LCC, as asserted by Seah (2009), has demonstrated that sustainable or green buildings have a longer lifespan and

lower operating costs. However, the literature showed that establishing LCC for sustainable building development does pose a challenge (Essa and Fortune, 2008; Kohler and Lutzkendorf, 2002). It is a challenge due to the continuous demands for product specific information throughout their life (Hakkinen, 2007). The introduction of new materials and new construction methods will continuously occur, thus widening the gap of the adequacy of currently available databases; As a result,, more research is required (Abd Rashid & Yusoff, 2015). As engineers together with energy consultants are better equipped to innovate on energy efficient solutions (Bartlett and Howard, 2000), QSs tend to rely on those engineers for materials' information in order to come up with cost information (Ma and Luu, 2013).

Therefore, a collaboration between key stakeholders, is essential in the delivery of sustainable projects (Yunus et al., 2011). As part of the design team, the integration with other stakeholders will help the QSs to develop better cost data and information (Yunus et al., 2011). Moreover, through collaboration with the project team, the QSs can provide advice on cost-related issues and as well as value in appraising the performance of the buildings (McDougall et al., 2002). Emuze and Smallwood (2014) suggested that the procurement process is a good starting point for collaboration, as barriers to the development of sustainable buildings often occur at that stage (Elforgani and Rahmat, 2010). As the QSs are primarily involved with procurement development and project's documentation (Matipa et al., 2008), they could proactively participate in trying to reduce uncertainty around sustainable materials' cost and the selections at the early stage of the project (Elforgani and Rahmat, 2010). For instance, as the design evolves, the QS will continuously feed the architect with information and options so that the architect can consider those options when creating their design. The information and options are not just for the cost-efficient design (McGaw, 2007) but also on the impact of environmental measures and alternative sustainable solutions (Ashworth et al., 2013) without the need for the architect specifically, to lose the aesthetic aspect of the design. Their skills in measuring

building works have been acknowledged by the RICS (2009) to be well suited for advising alternative building materials that ought to have an impact on the environment. In this instance, making choices will require a comprehensive assessment in order to guarantee that the decisions made will have minimal impacts on the environment (RICS, 2009).

Ma and Luu (2013) argued that for the QSing profession to remain relevant (i.e. in advising on alternative solutions), the QSs will need to increase their knowledge and skills on sustainable products and technologies. These can be achieved through training and research as well as understanding the whole life of building starting from pre-construction so that QSs able to provide not just quality cost advice on sustainability but at the same time adding value to their client's project (Olawumi and Ayegun, 2016).

2.9.2.1 Perceived Lack of Engagement with Sustainability

The discussion on the role of QSs in relation to sustainability issues has thus far shown that the roles are evolving in order to accommodate and drive the construction industry towards sustainability. The discussion also highlighted areas that QSs can effectively contribute. However, what is lack in the literature is the actual contribution of QS professionals or their active involvements towards ensuring sustainability. A study by Talukhaba et al., (2005) on project stakeholders' perception revealed that clients, local authorities and architects (in that order of merit) have a greater influence in the implementation of socio-economic sustainability ideas in projects. Among members of the design team, QS and structural engineer were seen to have less influence in this regard.

A study by Elforgani and Rahmat (2010) on the level of design team member's involvement during the green design process revealed that architect, mechanical and electrical (M&E) engineers have a high level of involvement. Structural and civil engineers, interior designers

and QS, on the other hand, have a low-level involvement. This finding indicated that the architect and M&E engineers could be considered as key players during the design stage as they have high influence in terms of decisions regarding the choice of materials, building envelop, and energy efficiency.

A study by Ma and Luu (2013) on the perceptions of QS firms in South Australia of the importance of QS role in promoting green building development, the study revealed that only 45% agreed while 29% were undecided and the remaining 23% disagreed. Therefore, from this study, over half of the respondents fail to see their roles as being important in promoting green buildings. Moreover, the study also revealed that at the moment, the QS firms are not engaged in sustainability as often as those of their traditional roles. In addition, most of the evidence also suggested that they are just continuing doing what they always do in terms of service provision.

Another study was conducted by Koigi (2017), where the author investigated the role and perceptions of QSs in South Africa who had experience with sustainable buildings projects. Participants regarded the early design stage as an ideal avenue of contribution, and the QS were more likely to contribute when they have had experience (lesson learnt and knowledge) with managing sustainability elements in previous projects. QSs, however, believed that they generally have little influence and they were aware of their minor role in the project teams especially when it comes to providing alternative building specifications as the client and architect who have the final say on what is incorporated into a project.

As part of the client's main advisory team and design team, QSs play an important role, as important as the other members of the design team as illustrated in Table 2.2. In this instance, why do sustainability efforts mostly revolve around architects or designers and engineers (Chong et al., 2009; Pooley, 2016) and not QSs? As previously discussed, QSs with their expertise in cost and economic aspects of a construction project has placed them in an important

position to advise the client and the project. In addition, QSs arguably have sufficient knowledge and skills to advise clients and other consultants about the sustainability aspects but they are not actively doing so. These issues have led the researcher to focus on the QSing profession in an attempt to investigate why is this lack of sustainability-related practice relatively unproblematic to them. As a profession, these QS professionals have the responsibility to not just protect their client's interest but also to sustain public-industry harmony (Poon, 2004). This research is also focused on accredited QS professionals where as members of a professional body (i.e. the RICS for this research), they are strictly regulated by professional codes of conduct and ethical standards as guiding principles of their daily practices (Bordass and Leaman, 2013; Hill et al., 2013). Therefore, as asserted by Matthew (2014), the trust in these professionals is placed on the presumption that the service provided will be of benefit to the client and the public.

Table 2.2 Roles and responsibilities of members of design team

	Appraisal, design brief, concept	**Design development**	**Product information, tender documentation, tender action**	**Construction planning & operations**	**Start-up for Occupancy**	**Operation or Maintenance or Management**
Architect	▪ Assist the client to prepare a strategic brief. ▪ Carrying out feasibility studies & options appraisals. ▪ Advising on the appointment of other professionals.	▪ Preparing designs, planning applications, application for statutory approvals, production information, tender documentation. ▪ Reviewing designs prepared by others.	▪ Preparation of contract drawings, schedules and specifications. ▪ Assist the client in selecting the contractors. ▪ Advising on the procurement route. ▪ Contributing to the assessment of tenders.	▪ Acting as contract administrator. ▪ Periodical inspections of compliance with design and specifications.	▪ Inspecting the works. ▪ Certification that the work had been completed in the correct manner.	▪ Advising on the rectification of defects.
Civil & structural engineer	▪ Contributing to the preparation of briefing documents, feasibility studies and options appraisals.	▪ Structural design and detailing. ▪ Selection of materials (economic, strength & durability) ▪ Site investigations	▪ Produce drawings, specifications, schedules. ▪ Assist the QS preparing BQs & costing. ▪ Assist the client in assessing the suitability of the project, regarding statutory requirements.	▪ Periodical inspections of compliance with design, schedules & specifications.	▪ Inspect structures to ensure that they are efficient and stable.	▪ Maintenance.

M&E or Building Services Engineers	▪ Contributing to the preparation of briefing documents, feasibility studies and options appraisals.	▪ M&E or building services design ▪ Influence the architectural design of building; facades, energy efficiency & indoor environment.	▪ Produce drawings, specifications, schedules. ▪ Assist the QS preparing BQs & costing. ▪ Assist the client in assessing the suitability of the project, regarding statutory requirements.	▪ Periodical inspections of compliance with design, schedules & specifications.	▪ Inspect systems to make buildings functional, efficient and safe.	▪ Maintenance.
Quantity surveyor	▪ Prepare cost plan & budget establishment based on the brief. ▪ Helping determine the client's requirement & undertaking feasibility studies ▪ Preliminary cost advice. ▪ Advising on procurement strategy	▪ Checking designs development against the project budget. ▪ Assessing value for money. ▪ To provide cost advice on alternatives during selection of materials, building components and equipment.	▪ Prepare & pricing BQs. ▪ Advise on alternative materials. ▪ Prepare contract documents. ▪ Prepare tender report for consideration. ▪ Advice on selection contractors.	▪ Carry out interim valuations, value variations, etc. ▪ Preparing regular cost reports, including out-turn cost and cash flow.	▪ Inspecting the works.	▪ Completing the final account. ▪ Advising on repairs & maintenance costs. ▪ Evaluation of life cycle.

(Anyanwu, 2013; Ma and Luu, 2013)

As a professional body and in order to develop its sustainability credentials, the RICS formed the RICS Sustainability Working Group in 2002 (Dixon et al., 2008). Furthermore, in 2005, the body formed the Presidential Commission on Sustainability and established the Sustainability Policy Principles in the same year. According to the sustainability policy principles:

"RICS members are uniquely placed to contribute to sustainability [...] it is our intention to place sustainability at the heart of all its activities: Promote community development and social inclusion; Promote social and environmental equality; Encourage the sustainable use of resources; Reduce waste generation and dispose of waste responsibly; Protect and enhance natural environment; Strive to reduce energy consumption; Promote sustainable design, development and construction; Promote sustainable land use and transportation; When pursuing economic goals […] seek to enhance or at least minimise negative social or environmental impacts." (RICS, 2007a)

The principles, thus reinforced the important role of surveyors at each stage of the building lifecycle process due to the prevalent impacts of the construction projects (Presley and Meade, 2010). A study by Dixon et al. (2008) on the engagement of RICS members with the sustainability agenda revealed that legal obligations are a key driver in driving members' engagement. Given this argument, the current study highlighted that their engagement with sustainability is mainly driven by their job requirements rather than from their motivations and initiatives. Moreover, as has been previously discussed in Section 2.2.4, main drivers of sustainability are either the clients or to comply with legislation and regulations. Therefore, can the public still place their trust on these professionals to provide them with services that are of benefit to the public?

2.10 Conclusion

This chapter reviewed the literature relevant to concepts of sustainability and PI in contexts of professional education and practices in the BE sector. It is revealed that the progress of sustainability in the sector is relatively slow, indicating that relying on government rules and legislation, and the demands from the market and clients are not sufficient for a more swift movement towards sustainability. Thus, adopting the PI approach is proposed to increase sustainability practices among professionals in the BE sector as PI involve internalisation of profession's value and norm as part of an individual's behaviour and self-concept. One of the criteria of the profession is a sense of responsibility to serve the public, and this should be one of the driving forces towards encouraging more sustainability practices by members of the profession. As concerns regarding sustainability were often subjected to tensions between short-term gains and the long-term benefits, this dilemma is probably one of the reasons for the lack or inactive involvement of CQSs in sustainability. Apart from investigating the existence of interplay between the emergence of PI and sustainability, this research will also explore how the tensions or dilemmas are manifested. The tensions and dilemmas, as mentioned in the research framework in Section 3.3 will be further examined in the results and findings chapter (Chapter 6).

Chapter 3: Methodological Approach and Research Design

3.1 Introduction

This chapter introduces the methodology underpinning this study. The methodology is a particular social-scientific discourse that occupies a middle ground between discussions of a method (procedures and techniques) and discussions of issues regarding the philosophy of social science (Schwandt, 2014). According to Punch (2005), it situates the researcher in the empirical world, connecting the research question to the data, and it raises some rather pertinent issues relevant to the choice of research design. In choosing the most appropriate research design, the nature of the problem weighs heavily on the decision process. Specific approaches to research are determined by the social research problems that are being investigated (Creswell, 2003). First, the methodology underpinning of this research will be described. This description will also cover a discussion of philosophical assumptions, conceptual frameworks, and research approach relevant to this study. Second, the method will be explained to provide a thorough outline of the research process. It will discuss the details the preparation, design, and data analysis stages, before summarising the chapter.

3.2 Philosophical Assumptions

Philosophical positioning will influence the choice of methodology and methods used in research (Carter and Little, 2007). Therefore, it is essential to identify and discuss the philosophical stance of the study. Ontological or epistemological approaches are the two traditions in social research (Bryman, 2016). This section discusses these two approaches and clarifies the philosophical positioning of this research.

3.2.1 Ontology

King and Horrocks (2010) defined ontology as a study of being, that questions the nature of reality or social life. Assumptions are then made about how things are and how things work (Scotland, 2012). Sikes (2004: p.20) suggested that the "social world is socially constructed and subjectively experienced as the result of human thoughts as expressed through language". Therefore, the approach seeks to determine what makes a thing the way it is and looks into the cause of its existence. There are two positions within the ontological approach, namely objectivism and constructionism. These two are discussed next.

Lakoff (1987: p.158) argued that objectivism is "one version of basic realism" which exists independent of humans. This statement implies that social phenomena in everyday discourse, have an existence that is independent and beyond the influence of the actors (Bryman, 2016). For example, as part of an organisation, individuals should abide by the rules, regulations, processes, procedures or even apply the values that are placed upon them by their organisation. If they did not comply, they might get reprimanded or even fired from the organisation. The organisation is controlling every act and behaviour of its members.

Similar things can also be said about culture as well, where the shared customs and values constrain individuals' own (part of that culture) values and beliefs. Therefore, culture and organisation have their own set of rigid rules to which members need to adhere (Bryman, 2016). Fundamentally, natural science has been based on realist ontology. Empiricism is based on scientific experiments and observations that often disregard a theory as an essential element. Therefore, findings are explained with the use of relationships between the variables that are quantifiable with figures and predictions made by various tests of strength. With the belief that

a world exists independently of human relations, the researcher would be able to predict and also generalise behaviours of the population (May, 2011).

Constructionism, in contrast, is fundamentally anti-realist (Hammersley, 1992). It proposes that "knowledge does not exist independent of the learner, knowledge is constructed" (Vrasidas, 2000: p.7). Through social interaction, individuals construct knowledge within their communities of practice (Brown et al., 1989). The world consists of shared meaning that is based on individuals' views and their experiences of the world around them. Thus, the paradigm emphasises human experience, built on the understanding of the individuals about the social world that they live in (David and Sutton, 2011). Reality and individuals' perceptions of reality are not separated, and reality is also socially defined (Hammersley, 1992) by individuals or group of individuals. Therefore, human beings are fundamentally different from objects. Human beings cannot be subjected to the same treatment as objects, i.e. as experimental materials. To understand and interpret human actions and behaviours, researchers require different methods apart from those used in natural sciences.

According to Bryman (2016), there has been an increased incorporation of knowledge about the social world into constructionism. Constructionism has a commitment to a dualist epistemology and ontology because knowledge is also a human product. Viewed from the perspective of social constructivists, knowledge is socially and culturally constructed (Gredler, 1997). According to these scholars, meaning is created individually through individuals' interactions with their environment and with each other. Reality can be different between individuals because it based on each individual's experience of the world and unique understandings of it (Berger & Luckmann, 1967). A constructivist "predicates individuals as active agents" (Lowstedt and Raisanen, 2014: p.1094) in the development of themselves.

3.2.2 Epistemology

Epistemology relates to assumptions about the relationship between individuals and it "concerns with the nature and forms of knowledge" (Scotland, 2012: p.9). The concept focuses on the theory of knowledge or how knowledge is created and can be acquired and assumes that reality is subjective and varied across individuals. The position can be either positivist or interpretivist, and these two are discussed next.

Positivism according to Ritchie et al. (2003) is the paradigm that holds the view that since human behaviour is governed by law-like regularities, therefore, methods used in natural sciences are applicable to social inquiry. The approach offers a formal process where, in order to measure phenomena and to produce findings, typically numerical data is used. It is also possible to carry out a value-free, objective and independent social research as reality is viewed as universal and quantifiable. The research tries to test the theory.

Interpretivism is the opposing view of positivism. The assumption is that reality can be access through social constructions like shared meanings and language (Myers, 1997). The paradigm's philosophical base is phenomenology and hermeneutics (Van Manen, 1990) where it tries to understand various phenomena through meanings that individuals assign to those phenomena. It focuses on the complexity of how human makes sense of an emerging context.

The research methodology adopted here is therefore informed by a constructivist or interpretivist paradigm that would be further discussed in Section 3.4.

3.3 Conceptual Overview

This study was driven by a pressing global problem, which was the deterioration of the natural environment that mostly caused by human activities. This research is, therefore, governed by and conducted to answer research questions that arose from the preliminary study (Section 3.3.1) and an examination of the literature. Thus, data collection and analysis were mobilised to help clarify the research problem that had been identified in Chapter 1.

3.3.1 Preliminary Study

The purpose of the preliminary study was to gain an understanding of the graduates' (five graduates from the University of Reading) perceptions of sustainability after they have been working in the construction industry for a year or two. The method used was a semi-structured interview. The findings from the study are as follows:

- Their degree programme did provide these graduates with an awareness of sustainability, and two of them seemed relatively more enthusiastic about sustainability compared to the others.
- Not many organisations were looking for graduates with an awareness of sustainability.
- None of the graduates had an opportunity yet to be involved with sustainability in their work. Two of the graduates stated that their company has a sustainability course to make sure that everyone has an awareness of it. The other three said that the company has sustainability experts or teams that are responsible for the sustainability-related areas. Since they were not part of that team, therefore, they have not been involved in any sustainability-related issues yet.

These findings thus pose two questions (1) How would these situations affect graduates' perceptions about the importance of sustainability within their work and the construction industry in general? (2) What would be the impacts of these on their future roles and responsibilities as professionals?

The study also identified that four out of the five graduates were already planning and preparing for chartership status (professional accreditation or membership). This demonstrated that becoming a recognised professional is important to them from the early stage of their careers. As asserted by Nichol and Williams (2014), gaining a membership to some professional bodies means that their experiences were legitimate (their expertise is being acknowledged) and it boosted their confidence to be given 'a seal of approval from the world' or 'a badge' that made them feel complete as a professional. Therefore, the findings from this preliminary study had acknowledged the importance of the concept of professionalism (enactment of professional roles) and PI (self-conception of professional self).

The concepts of PI and sustainability, therefore, were used to provide a framework for this study. Based on the literature review, there is a clear indication that more research needs to be conducted on the PI of BE professionals and the interplay of this identity with sustainability practices. A study by Maduka et al. (2016) revealed that the level of promotion of sustainability by the construction sector is lower than expected, and it also lags behind other industries. Thus, they indicated that the industry needed to find different strategies to contribute to the global mission for sustainability. A shared sense of purpose for all BE professionals was suggested by Hartenberger et al. (2013) as a critical ingredient in cultivating the implementation of sustainability within the sector.

3.3.2 Professional Identity and Sustainability

The shared sense of purpose, suggested by Hartenberger et al. (2013) showed similarity to the model of one of the earliest professions, i.e. the medical profession. It was described not only as a call to serve God but also a call to serve the public (O'Day, 2000) through a shared universal code of ethics. The Hippocratic Oath is a moral code that is still held sacred by physicians. It serves as a guide to conduct and to uphold ethical standards, specifically in the medical profession. This firm commitment probably helped in developing a feeling of pride and understanding among doctors regardless of their specialisation. The code might also account for their strong sense of PI as well.

PI, as described in Section 2.7.1, serves as a guide for professionals' practice, including their thinking, action and interaction (Fagermoen, 1997). Even though identity or PI may or may not provide solutions towards more sustainability practices within the BE sector, it is still imperative to explore and to study this concept in relation to the BE professionals. The findings may nevertheless shed some valuable insights and contribution in creating a common ground to overcome the sustainability issues within the sector that consists of a variety of professions. The PI concept has a theoretical positioning, i.e. professional socialisation that has been consistently acknowledged as a crucial factor for the formation of identity (Jackson, 2016; Loseke and Cahill, 1986). This professional socialisation, therefore, has allowed this research to develop the research framework as discussed in Section 3.3.3.

Sustainability is another broad area as well (as discussed in Section 2.2), and to date, there has yet to be a shared agreement among scholars on its definition. Sustainability is a long-term commitment that influences people's choice and motivations, and this can mean different things to different people or groups (O'Brien, 2012). This meaning-making aspect can raise ethical

concerns such as what constitutes a more beneficial state, at what scale and who determines it. Therefore, with their esoteric knowledge and skills, professionals are expected to translate and make sense of sustainability for the benefit of others, especially those involved in the construction projects.

In addition, professionals who are part of a given profession have a commitment to uphold the institution's value for the public good (Hughes and Hughes, 2013). They have an implicit or unwritten social contract with society at large, and this includes protecting the public's well-being and safety and also a commitment to the issues of sustainability that the world is facing now and more so in the future. This social contract or ethical codes sometimes lead to internal conflict for some professionals who have difficulties in choosing between achieving their organisation's goals or their client's needs and fulfilling their social contract to the society (Mayer, 1988). This poses a question as to why they face this kind of dilemma. Since they acquire esoteric and complex knowledge and skill, would that give them the authority in convincing their organisation and specifically their client? The commitment and dedication are needed, especially when it comes to something that could harm the society if left unchecked like the issues of sustainability, for instance. Is this one of the reasons the construction sector is slow in embracing and practising sustainability? It is possible that the built environment professionals do not have knowledge and skills to manage the issues of sustainability? Perhaps, as previously discussed, is it because the built environmental professionals do not have a strong PI that could provide them with a clear understanding of their duties and responsibilities as professionals and as members of a profession and professional institution?

As sustainability covers an expansive area, the researcher deliberately did not define the concept of sustainability to the participants because this will allow the participants to talk about the concept freely and it will also allow them to define the term based on their views of

sustainability. Nevertheless, the review of available literature in Chapter 2 has provided a sufficiently clear structure to frame the definition of sustainability.

3.3.3 Research Framework

The purpose of this research is to explore the emergence of the concepts of PI and sustainability and to investigate the interplay, if any, between the two concepts that may contribute towards more practices that promote sustainability within the BE sector.

Therefore, the framework for this study is, as shown in Figure 3.1. This is based on "the view that individuals move from self-centred conceptions of identity through a number of transitions, to a moral identity characterised by the expectations of a profession – to put the interests of others before the self, or to subvert one's ambitions for the service of society or the nation" (Bebeau and Monson, 2008: p.572).

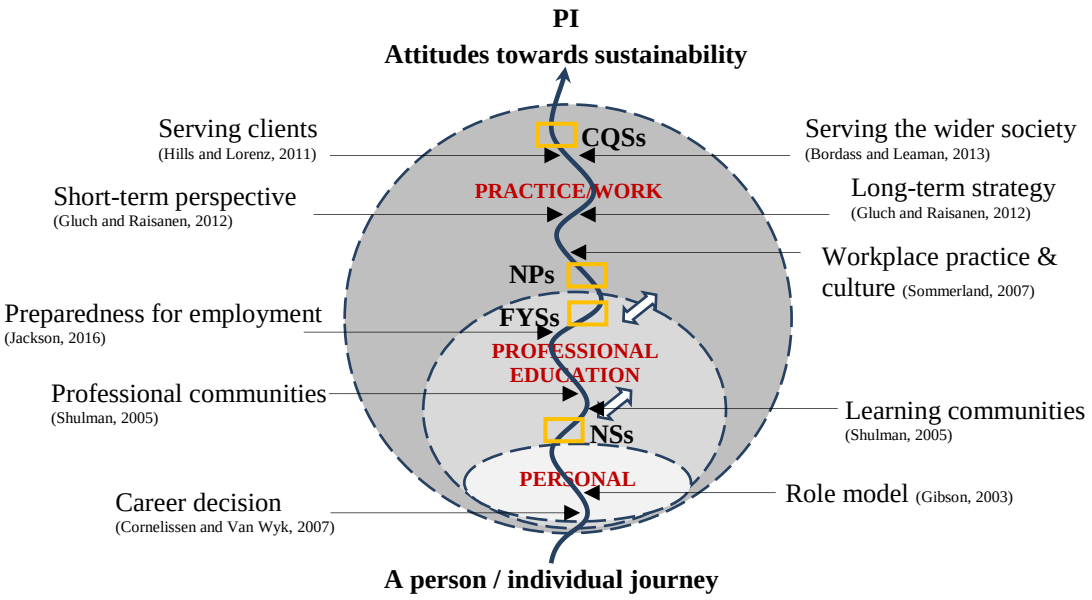

Figure 3.1 Research Framework

Forming and developing PI is an individual journey. With reference to the framework above, Trede et al. (2012) elaborated that, in becoming a professional, one (PERSONAL) will begin

by learning (PROFESSIONAL EDUCATION) and associating oneself to be similar to the members of a particular profession. Consequently, one will then differentiate oneself from others (not part of that profession) and eventually identify oneself with that profession as part of the members of that particular profession (PRACTICE or WORK). The dashed lines reflect how each of these three contexts is non-linear and interacts with each other rather than being considered as separate entities. While learning about the profession, even though some individuals may have preconceived ideas about their chosen field or profession, their views might be modified as they gain more knowledge (Weideman et al., 2001). By socialising with others; they will subsequently communicate with and support each other (peers) within their communities, learning by observing their peers and also their faculty, and developing their roles. They will internalise their professional role, and this will help them in forming their PI.

Throughout their journey, individuals will develop a basic concept of their sustainability and PI. Along the way, there will be various influencing factors, both internally or externally, or they might face some complexities and dilemmas that might affect, shape their individual sustainability and PI or even disconnect them. The influencing factors and dilemmas identified in the literature (see Section 2.7.2) are represented by the black arrows on each side of the wavy line.

Sometimes, there can also be a disconnection between personal and professional ethics and responsibilities (Dunphy, 2013). Therefore, the middle 'wavy' arrow indicates the journey of a person or an individual which might not be a straightforward and easy way of forming and developing PI and sustainability. Identification with and commitment to these two can be complex, but the continuous developmental process (Mrdjenovich and Moore, 2004) and personal identity are said to be connected to PI as well (Ohlen and Segesten, 1998). The

'waviness' of the journey, as illustrated by the middle arrow, might differ over time and between individuals.

3.3.4 Research Paradigm

Professionals have been regarded as the most influential agents of an institution (Scott, 2008). By becoming a member of a professional body, these professionals have a strong professional status and perceptions (Daudigeos, 2013) that their involvement coupled with the knowledge that they have about sustainability will afford them a degree of technical legitimacy that might influence and manoeuvre strategies towards achieving sustainability. Therefore, it is imperative to explore what professionals and future professionals personally think about sustainability. In addition, the PI concept is still under-explored within the BE professions. PI is integral to a profession, yet the concept has yet to be well defined. There are a few types of research (Section 2.7.3) related to PI in the BE area, but they are not the main focus of the research. It is also imperative to explore how current and future professionals perceive their PI and whether this identity has any influence on their motivation towards sustainability and sustainability practices. What would be the factors that might shape, or cause conflicts or tensions in their understanding and attitudes towards sustainability? The findings from this research could clarify whether PI can be another strategy that can be employed to accelerate sustainability practices among the BE professionals.

Therefore, in this study, the researcher posed the following questions:

i. How can educational experience play a part in the formation and development of PI?
ii. How can practice or work experience play a part in the formation and development of PI?
iii. How do current and future professionals perceive their PI?

iv. What are the influencing factors in forming and developing PI?

v. How can educational experience play a part in the formation and development of attitudes towards sustainability?

vi. How can practice or work experience play a part in the formation and development of attitudes towards sustainability?

vii. How do current and future professionals perceive sustainability?

viii. What are the influencing factors in forming and developing attitudes towards sustainability?

ix. What interplay, if any, exists between the two concepts and how could this help contribute towards more sustainability practices?

The research methodology adopted to answer these questions is informed by a constructivist or interpretivist paradigm. The epistemological assumptions of constructivism or interpretivism are that truth or meaning come into existence in and out of our engagement with the real world as described (Crotty, 1998).

Constructivism captures the essence of what the researcher's believe is important to the study and to the participants in constructing meaning from their experiences (Schwandt, 1998). This approach is used to address and examine the experience gained by the participants from their professional socialisation process: socialisation for work and socialisation by work. These two stages have been discussed in Section 2.7.2, and they are the two contexts that the participants of the study went through that helped shape their PI and attitudes towards sustainability.

The interpretivist approach is well-suited to analyse different experiences of the participants as the study focuses on the perceptions of future and practising professionals regarding their PI and attitudes towards sustainability. The assumption is that people create and link their

interpretations and meanings to their environments and also their behaviour (Lee, 1991). They interpret and try to understand the situations themselves. Therefore, the researcher is expected to understand and interpret the deep meanings attached to participants' actions and behaviours, specifically in relation to sustainability.

3.4 Methodological Approaches

This section discusses the methodology of the study. Punch (2005) clarified that it positions the investigator or the researcher in an empirical world. The author further explained that it would connect the research questions to the data and raise relevant issues about the choice and selection of the research design approaches. The specific strategies are determined by the research problems that are being investigated (Creswell, 2003) as well as from the analytical framework laid out in Section 3.3.3. The following sub-sections outline the research strategies, namely the quantitative and qualitative methods as well as the justification why they have been selected for the current study.

3.4.1 Quantitative

Bryman (2016: p.32) described quantitative research as representing "a research strategy that emphasises quantification in the collection and analysis of data". He elaborated that in testing theories, a deductive approach to refute the relationship between research can be used and the theory commonly used in investigating relationships and correlations can be chosen. Therefore, studies that used quantitative approaches mostly have hypotheses, and they often use methods that generate numerical rich data (David and Sutton, 2011). The methods include experiments, questionnaire surveys and structured interviews. Quantitative research entails variables that are measured and tested that applies natural science, particularly based on positivist approaches, to examine the social phenomena discussed in Section 3.2.2.

3.4.2 Qualitative

Qualitative research provides "systematic, context-based, descriptive observations of phenomena" (Plante et al., 1994: p.52). The approach seeks to understand and interpret how people attach meaning to phenomena within their social world. The phenomena can be actions, beliefs, decisions and values, to name a few. Methods used in this approach include interviews, document analysis, and observations that can address the research questions that require interpretation, understanding and explanation of social phenomena and their contexts. Thus, the approach is deemed to be more flexible compared to a quantitative approach. The flexibility was due to the nature of the qualitative research that emphasised on discovering unanticipated findings that there might have the possibility of altering the original plan in order to respond to the unforeseen occurrences (Glaser and Strauss, 1967).

3.4.3 The Study Approaches

This study employed a qualitative approach that was deemed to be appropriate as the study was investigating the process of PI and attitudes towards sustainability formation as well as the development and the probable interplay between the two concepts. The study investigated how the participants made sense of their lived experience. This approach also provided a detailed understanding and valuable interpretation of the complex construct of PI and attitudes towards sustainability from professional education to practice or work contexts. According to Heppner and Heppner (2004: p.138) "objective reality can never be fully understood or discovered and that there exist many possible ways of looking at realities". Therefore, within the constructivist approach, multiple realities are accepted in order to have an overall understanding. From the literature review, it is evident that both PI and sustainability are fluid and diverse as definitions of both concepts are continually evolving. Thus, the study examined the fluid nature of these

two concepts and how they develop from professional education to practice or work by answering these research questions: In what way do educational and practice experiences play a part in the emergence of PI and attitudes towards sustainability? What are the influencing factors that help to form and develop PI and attitudes towards sustainability?

The qualitative interpretive approach is an "attempts to develop a coherent and comprehensive view of the subject material from the perspective of those who are being researched" (Fellows and Liu, 2015: p.79). Due to the subjectivity nature of identity and personal as well as professional beliefs concerning sustainability, it is appropriate to investigate these aspects using the interpretive approach. The interest of the research was not just on what the participants said about their PI and sustainability but also how they presented themselves. Therefore, the study attempted to create a coherent narrative out of their experiences and available discourses. The focus of the data analysis was on the emerging and recurring themes from the participants' viewpoints and understanding individual perspectives (self-perceptions and opinion) based on the subjective nature of their experiences in relation to these two concepts in a particular context. The approach is to try to answer this question: How current and future professionals perceive their PI and attitudes towards sustainability? The approach is also to understand and interpret the deep meanings attached to the participants' actions and behaviours, specifically in relation to sustainability by addressing this question: What interplay, if any, exists between the two concepts and how does this contribute towards more sustainability practices?

In summary, the study used a qualitative methodology based on an interpretative and constructivism approach. In this investigation, the goal is to make sense of individuals' subjective world and the meaning-making process through which people construct their self-understanding and social interactions within a social context (professional education and practice or work).

3.5 Research Designs

To answer research questions established in a study, a research design is used to generate data and evidence (Bryman, 2016). It provides a guideline for data collection and analysis. Therefore, it is vital that the researcher not only know the research problem but also has a set of plans to systematically assist and help in tackling the problem. A type of research design that will be used in a research study is informed by the nature of the research questions and philosophical positioning. There are ranges of selection for a research design from ethnography, experimental, case study, longitudinal study and cross-sectional study, to name a few. The selection will depend on the data that the research wishes to obtain. This research adopted a cross-sectional design as it fulfils many criteria of the study, as demonstrated in the following sub-section.

3.5.1 Cross-Sectional Design

"Cross-sectional studies are used to explore macro-level change, where the focus of change is not on the individual but the wider context within which they are situated" (Ritchie et al., 2003). From the research framework in Section 3.3.3, PI and attitudes towards sustainability are formed and developed over time. Therefore, as illustrated in the framework, the researcher created four categories of cross-sectional study to examine the formation and development of the two concepts in quantity surveying (QSing) professional education and profession. The groups are:

1. New students (NSs)
2. Final year students (FYSs)
3. Novice practitioners (NPs) (<5 years)
4. Accredited practitioners or chartered quantity surveyors (CQSs)

Details about these categories are further explained under the sampling in Section 3.5.3. This type of design means that the study does not have data from the same individuals at different points of time, but from different individuals at various stages of their professional education and working practices. The data from all these categories were collected around the same time. The reasons for this are to understand better what happened during each point of time that might help shaped and influenced PI and attitudes towards sustainability. The comparisons that will be reported should be viewed as differences and similarities between the participants.

3.5.2 The Study Site

This study was conducted in the United Kingdom, and the main reason was that this country is one of the leaders when it comes to the sustainability movement and the UK government has also targeted 80% greenhouse gas reduction by 2050 (HEFCE, 2009). The RICS was founded in the UK, and the headquarters is located here. It is a global professional body that accredits practitioners in the land, real estate, construction and infrastructure sectors worldwide (RICS, 2017). As for the educational sector, the researcher chose the School of the Construction Management and Engineering, University of Reading as the Quantity Surveying programme is offered by this school. The school is an internationally recognised centre of excellence in teaching and research in the built environment. The courses offered are fully accredited by professional bodies such as the RICS and the Chartered Institute of Building (CIOB).

3.5.3 Sampling or Participant Selection Criteria

Purposeful sampling was used in selecting suitable participants within the groups, as mentioned in Section 3.5.1. It was not for its ability to represent but for its relevance to the research questions, analytical framework, and explanation developed in the research (Schwandt, 2014). In other words, they were selected to serve the purpose of investigation. One of the advantages

of adopting purposive sampling was that it allowed for greater flexibility if there was a need to seek out new participants due to unforeseen circumstances. Some of the participants, especially the current students (NSs and FYSs), were also easily accessible to the researcher. All of the participants were chosen primarily due to their availability. Finding the participants, especially practitioners (NPs and CQSs) who were willing to meet for about one to two hours was quite a challenge. Therefore, the issue of availability of all the parties involved in this research made purposeful sampling an appropriate choice.

The participants were drawn from four categories, as previously mentioned in Section 3.5.1, with a minimum of 10 participants from each category that amounted to 40 participants overall. The number should be sufficient as the goal was to cover relevant diversity in an empirical-defined population rather than exhaustively detailing the concepts for generalisation or a theoretical domain. Moreover, qualitative research focused more on understanding the meaning of the phenomenon being investigated (Marshall, 1996). The goal of qualitative research enriches the understanding of the experience. Therefore, it needs to select relevant participants for the study. The concern was whether the data collected were sufficiently rich to bring refinement and clarity to the understanding of the experience.

Participants from the educational context are the NSs and the FYSs both from the QS programme from the School of Construction Management and Engineering, University of Reading. As for the post-degree experience, the professional phases proposed by Ronnestad and Skovholt (2003) were used for this study and all of them were QS practitioners. The NP group included graduates (from the same University as NSs and FYSs) who had been practising, with less than five years of work experience and had not received their chartership status. The accredited practitioners are members of the RICS and had been practising as a CQS. As the orientation of how the profession was described by the professionals, according to Jung (2010),

it is crucial in outlining what it means for them to be a member of that profession. The practitioners' years of working experience are as illustrated in Table 3.1 below.

Table 3.1 Practitioners' years of work experience and chartership status

Participants	Total years of work experience	Chartership status (total years of chartership)
np1	<1	-
np2	<1	-
np3	<1	-
np4	2-3	-
np5	1-2	-
np6	1-2	-
np7	1-2	-
np8	<1	-
np9	3-4	-
np10	2-3	-
p1	35	FRICS-1989 (28)
p2	49	FRICS-2000 (17)
p3	44	FRICS-1985 (32)
p4	56	FRICS-1973 (44)
p5	42	FRICS-1983 (34)
p6	15	MRICS-2008 (9)
p7	30	MRICS-2010 (7)
p8	24	MRICS-1999 (18)
p9	23	MRICS-1998 (19)
p10	6	MRICS-2017 (<1)

Based on Table 3.1, the participants are identified using an anonymous code based on the group that they are in and those codes are ***ns*** – new student, ***fy*** – final year student, ***np*** – novice practitioner, and ***p*** – chartered quantity surveyor. The participants are assigned a number based

on the order of the interview in each category. For example, as illustrated in Table 3.1, ***np1*** represents the first novice practitioner that the researcher interviewed.

3.5.3.1 Recruitment Process

i. First Year or New Students

Students are offered an opportunity during the welcoming week to engage in the research. 21 students had given their details, and they were then contacted via email to set up an appointment.

ii. Final Year Students

The researcher accessed the email address list of the final year students with the help of the administration of the School of the Built Environment. An email recruitment letter was sent to the students, requesting volunteers for the research.

iii. Novice Practitioners

The participants were identified through the alumni network of the School. Through the network, a recruitment request was sent asking for volunteers.

iv. Chartered Quantity Surveyors

The first step in obtaining the data was through the RICS website, where it had a list of its regulated firms. Since the priority was to do a face to face interview, therefore, companies are being narrowed down within the area nearer to researcher including Reading, Guildford and London. An email recruitment letter was sent to the firms, requesting one of their CQSs to participate in the study. The second step was obtained from the RICS website, but it focused on

the list of its members. The names of the CQSs identified were then search through Google Search and LinkedIn in an attempt to obtain their information such as the company that they work for and their contact information. Next, an email recruitment letter then sent to them.

Recruitment requests were then sent together with an information sheet (see Appendix A) that briefly explained the research, the process and the procedures. An appointment was then set up with those who responded and volunteered to be part of the research. The appointments were made, taking into account the time and place agreed with the participants so that they would be comfortable and would be more open during the interview. During the interview session, the researcher provided the participant with the information sheet again in the case that they have not had the time to read it prior to the interview or for the purpose of reminding them again about the research. The researcher provided them with more detailed explanation whenever needed. Upon agreement, each participant signed the consent form (see Appendix B) followed by a completed demographic form (see Appendix C).

3.6 Data Collection Method

3.6.1 Semi-structured Interviews

The primary data source for this study was the semi-structured interviews. The interpretive nature of this research places emphasis on these participants telling their stories and therefore, the study begins with the assumption that interviewing would produce stories and that "stories are a way to knowledge and understanding" (Seidman, 2006: p.7). The stories provide a narrative thread that participants draw on to make sense of their experience and themselves. The type of data collected for this research included responses to the interview questions designed to explore the participants' perspectives regarding their experience. The investigator conducted, audiotaped and transcribed all of the interviews.

3.6.1.1 Face-to-face Interview

The main method used in this study was the individual face-to-face interview as this method provided the opportunities for a detailed explanation of the experience from the individual participant (Charmaz, 2006). When the face-to-face interview was not possible due to certain circumstances, a telephone interview was adopted instead. This method was still able to provide the same function. The only setback was sometimes the coverage was not very good that it interrupted the flow of the conversation. Only four interviews were conducted through telephone calls. During the interviews, more personal and individual narratives could be explored in-depth. The semi-structured, and open-ended interview questions were derived from the literature study, and conceptual framework previously explained. To better understand the participant's thinking and perceptions, these types of questions will allow some flexibility. They also helped in eliciting responses and might also open up new directions of exploration (Krueger & Casey, 2000). Interviews also provide insights which would not only be revealing but invaluable in helping to determine the precise direction of research.

To provide a comfortable environment for the practitioners, the researcher allowed them to choose the location and the time most convenient to them hoping that this would facilitate more open and free conversations regarding the study and the topic discussed. Opportune time would allow the participants, especially the practitioners, to put aside time from their busy schedule and be more attentive during the session. The interviews with the practitioners were mostly done either in their private office room or in a meeting or conference room with closed doors. As for the current students, one of the rooms within the school's building was used, and all of the interviews were conducted during term time. This arrangement provided more privacy and fewer interruptions during the interview session and thus allowed both interviewer and interviewee to talk and discuss freely and comfortably. The need for follow up interviews would

only be considered after the transcribing and analysis process were completed (these two were being done simultaneously).

3.6.1.2 The Interview Questions

There were two sections of the interview question. The first section revolves around questions regarding PI and the second part was about sustainability. When explaining the study to the participants, the researcher did not specifically mention sustainability. The reason for this was when asked about the participants' professional learning, the profession and the PI, the researcher wanted to observe if the participants mentioned anything about sustainability in their answers. This was to determine whether sustainability is something they will consider as part of themselves or part of their role, is in their mind or whether they will make a connection with it in their answers about their job and role.

There was no gap to the first and second section of the interview question during the interview. Therefore, the interviewees were not aware of the two separate sections of the question. When the interviewer started to ask questions regarding sustainability, none of the interviewees gave any reactions to the question. They did not even question why they were being asked such a question when it was not mentioned prior to the interview.

Since there were four groups of participants, some of the categories of the questions remained the same for all the participants, some questions were reworded, replaced or omitted depending on each group (see Appendix D). The interview questions were designed to provide answers to the research questions as well as to guide this research.

Interviews were recorded using digital recorders. The recorded interviews were then uploaded and stored in a few safe storages. The total time for each interview depended on the category of the respondent. It spans from ten minutes (new students) to more than 60 minutes (practitioners). Transcripts of each interview were saved as a Microsoft Word file with copies being stored in several storages for safe keeping. Hard copies of the transcripts were produced for the analysis phase of the study.

3.6.1.3 Transcription

The option of having a third-party to transcribe the interviews was not an option at the time of study. Consequently, the researcher transcribed each interview session. Whilst it would have been more time-efficient to employ a third party to do the transcription, the process and experience of transcribing was extremely valuable in allowing the researcher to re-examine and revisit comments and topics discussed in the conversations. It also allowed the researcher the opportunity to pick up on the comments regarding particular interests and forced the researcher to pay attention to what the interviewees had said. Furthermore, it also helped identify the need for follow-up or subsequent interviews. The researcher managed to transcribe most of the interviews as soon as possible after the interview. From the transcriptions and preliminary analysis, the researcher decided that a follow-up interview would not be necessary.

3.7 Data Analysis

Data analysis for this study involved an ongoing process. Once the recorded interviews were transcribed, the next step was to analyse the transcript as soon as possible, as suggested by Kvale (1996). The analysis process started immediately after the transcription of the interviews were completed. The researcher was continuously immersed in the study, and the process of data collection and analysis were being done simultaneously (Maxwell, 1996). There are

several ways of how qualitative data can be analysed, and for the purpose of this study, thematic analysis was used. A variety of interpretations and meanings may be generated during the analysis as a researcher may also be influenced by her own perspectives and focus. The primary goal was to create patterns of thinking from the interviews' responses and grouping the ideas into thematic units.

The themes were pre-constructed from the literature review and the conceptual framework as laid out in Section 3.3.3. The purpose of the study was to understand the occurrence of PI and sustainability from perspectives of the newly enrolled students through the final year students as well as the perspectives of novice practitioners all the way to accredited practitioners. Therefore, the pre-constructed themes encapsulated the process that the participants went through that might shape their views on PI and sustainability. The themes were categorised based on the concepts of professional identity and sustainability which inevitably followed a narrative process from learning to practising. The analytic process was informed by this framework. Those themes are as follows:

i. Professional Identity
    - Socialisation for work (professional education)
        - Reasons for choosing QS discipline
        - The effect of learning for professional formation
        - Students' identification with the profession
        - Forming a sense of identity
        - Students' perception of their PI
        - The impacts of professional learning on graduates' (NPs) PI development

- Socialisation by work (practice or work)
  - NPs transition experience from learning to practice
  - NPs' identity development through practice
  - NPs' identification with the profession
  - NPs' perception of their PI
  - CQSs' identification with the profession
  - CQSs' perception of their PI

ii. Sustainability
  - NSs' sustainability awareness prior to professional education
  - Learning (professional education) engagement with sustainability
  - Work engagement with sustainability
  - Perceptions of the importance of sustainability
  - Perceived roles and responsibilities of QS professionals towards sustainability

As the researcher read through the transcripts, related phrases and ideas identified were coded. The process of constructing codes was constructed from the data and not from the pre-constructed themes in order to identify new emerging themes and categories or even new directions and not restricted to the pre-conceived ideas.

This coding process was being accomplished using the qualitative data analysis software NVivo 11; its primary function is to help with data management. The programme is "designed to help you organise, analyse and find insights in unstructured, or qualitative data like interviews, open-ended survey responses, articles, social media and web content" (QSR International, 2017). The other functions were to sort and arrange the codes from the transcripts. It was noted that part of interpretive work is to make and gain a sense of the whole data. Charmaz (2006) cautioned that reliance on the computer-aided programme might provide a one-dimensional view. A similar

issue is said about the coding approach because there might be a possibility of losing the context from the participants' responses (Bryman, 2016). Coffey and Atkinson (1996) also mentioned that coding might result in the fragmentation of data causing the loss of the narrative flow of the responses.

Therefore, the researcher took consideration of these two aspects while coding and using the software. The programme was mostly used during the initial stage of the analysis, i.e. during the process of organising the data. Notes were also used together with the transcripts to help guide the identification of codes and themes and also to highlight new insights that emerged. A detailed analysis was manually developed. During this coding process and from a closed and detailed reading of the texts, new emerging themes were added to the existing list.

As the study adopted a qualitative approach, it is a naturalistic inquiry that is an ongoing process which requires continuous interpretations and reviewing (Erlandson et al., 1993). The analysis process also used a comparative method by revisiting the data and comparing the data with existing literature and also to the previous data. Data development and interpretation that reflects individual participant's responses are also very important as highlighted by Ayres et al., (2003). According to them, it should also be equally applied across all of the data set. It is necessary to make sense of each participant's case and compare it and inspect it across cases to identify the shared themes among them.

The final stage of the analysis was constructing an interpretation of the findings and making sense of what had been learned. This part was the most challenging throughout the analysis process. In the next three chapters (Chapter 4, 5, and 6), the data are presented through verbatim quotations that were drawn from the transcripts. The quotations were verbatim from the interview, which illustrated the strength of their views. Direct quotations were either in *italic*

or in "...". Through the next three chapters, the researcher tried present the results and discussions that were not merely the refection of the researcher's voice, but also the participants' voices, and the existing scholars' voices were also respected them as well.

3.8 Ethical Consideration

It is necessary to be cautious by identifying and eliminating possible conflicts and making sure that the participants were aware of what had been done to address the issues. Researchers need to take into account the effects of their research on participants. Ethical consideration will protect the participants, and it is essential during the recruitment process, interviewing the participants and also during the data analysis (Jones et al., 2013). Therefore, for this study, ethical approval had to be obtained from the University Research Ethics Committee, University of Reading. A series of planning to determine the methods and tools for collecting data was recognised before submission.

All the participants were volunteers and were made aware that they could freely withdraw from the study at any time. An information sheet that provided details about the study and the scope of participation, including the consent form, was given to each participant. Before the interview started, apart from providing them with an information sheet, the researcher also thoroughly explained the study to the participant. The participants were also allowed to ask questions before they agreed to be part of the study and sign the consent form to make sure that participants were well-informed of the research. The informed consent offered information to the participants about the nature and the purpose of the research and the risks and benefits of their involvement (Ritchie et al., 2003). The forms for all the interviews were obtained.

At the beginning of each interview, the participants were reassured that their identity would remain confidential and that strict confidentiality would be maintained at all times. Their names and all the identifying information would be removed from the written transcript. They were also reassured that their responses were reflections on their views and perspectives and therefore, would not be judged as wrong or right. All the transcripts and related documentation were kept locked in a cabinet and softcopies are stored in a password protected storages.

3.9 Quality Criteria

The nature of qualitative research is primarily its subjectivity. Therefore, validity or trustworthiness depends on how this subjectivity is managed (Golafshani, 2003). This research is not meant to reflect the broader BE sector or even the QSing profession. Instead it is to provide a snapshot of a situation that may be beneficial in embarking on further explorations of related issues with a similar context.

This research was limited by the number of participants sampled as well as the degree of engagement with the participants. It was also recognised that some participants may be more highly motivated and had stronger opinions on the interview topic compared to other participants. Sampling in qualitative research is concerned with the balance between gathering sufficient rich data and the number of participants required to ensure that sufficient data can be collected (as discussed in Section 3.5.3).

During the data collection process, the researcher was the primary instrument. In qualitative research, it is fundamental to recognise the researcher's assumptions and biases because s or he filtered the data through his or her lenses (Heppner & Heppner, 2004). Therefore, the question of validity relies heavily on what the researcher considered valid based on his or her values and perspectives. This aspect will be reflected in the position and interpretation that the researcher

assumes in the study. For control purposes, the researcher recognised biases and assumptions related to the research area. The role is not to provide preferences to the data but as an active and valuable contributor to the development of knowledge.

3.10 Summary

This chapter presented the foundations of the methodology, including a discussion of the paradigm that underpinned the research, specifically, it identified which epistemology underpinned the entirety of the study. This stance suggested that truth is subjective, which led the research to select the qualitative methodology for this study. Qualitative research was deemed to be most appropriate, given the fact that the constructivist or interpretive paradigm was used to address, examine and interpret the experiences gained by the participants. It also allowed the researcher to investigate the origins and meanings of the participants' perceptions and opinions.

The next section outlines the research design. It involves the discussion about the adoption of the cross-sectional design with four different snapshots in the journey of formation and development of PI and sustainability, a description of the study site and the used of purposeful sampling. Next, data were obtained through 40 semi-structured interviews with 10 participants in each snapshot. The interviews were recorded and transcribed as soon as possible before the transcripts were used for data analysis. Thematic analysis was performed using computer software as well as manually to enable a thorough and detailed analysis.

The next three chapters (Chapter 4, 5 and 6) will present and discuss the findings obtained from the data collection process.

Chapter 4: The Emergence of Professional Identity

4.1 Introduction

As discussed in Chapter 1, this chapter is the first of the three results chapters. The results and discussion in this chapter focus on the concept of professional identity (PI) (Section 2.7 and Section 3.3.2) and set out to address the following research questions:

i. *How can educational and practice or work experience play a part in the formation and development of PI?*
ii. *How do current and future professionals perceive their PI?*
iii. *What are the influencing factors in forming and developing PI?*

The analysis of the data cited above is informed by the conceptual framework mapped out in Section 3.3.3 of this study. Based on the framework, PI formation and development involve an individual journey that stems from a socialisation process starting as early as childhood. The development might not be a straightforward journey as there will be factors (internally and or externally) that might have caused impacts and influences along the way.

For ease of understanding, the findings are presented in four sections. The first section is the socialisation for the work stage where it represents the social experience undergone (e.g., the role of family, social circle, education) and the attributes acquired before entering the working world. This section incorporated two phases of PI development before entering formal professional education, and during formal professional education. The second section presents the socialisation based on the work stage of the PI that corresponded to the participant's professional experiences, and the characteristics and qualities developed when a person (or

graduate) integrates into the world of practice and becomes a professional. At this stage, a graduate will transform from a mere novice to an accredited professional (i.e. as chartered quantity surveyors (CQSs)), with known identification and involvement with professional bodies, and their practice or work experience, and exposure form and shape their PI. The third section presents changes in the PI descriptions of the participants (final year students (FYSs), novice practitioners (NPs), and CQSs). These changes might demonstrate a shift in his/her perceptions about him/herself as a person, a professional, and his/her profession, which might consequently help highlight the emergence of PI. The final section of the chapter provides an analytical description of the influencing factors in the formation and development of PI.

4.2 Socialisation for Work

Socialisation for work involves the social and cognitive experiences that play essential roles in the development of attitudes towards work (Cohen-Scali, 2003). An individual might be exposed to different professions through their interaction with their family, academics or career advisors in school or college or university, or other people in his or her social circle. It was suggested that the work socialisation stage is particularly significant in influencing young people to aspire to become professionals (Cohen-Scali, 2003). The interest in a particular profession may promote and motivate involvement in career-related activities and as well as the acquisition of the associated skills (Lent et al., 1994). As mentioned in Section 4.1, the discussion is divided into two phases of PI development as subsequently discussed in Section 4.2.1 and 4.2.2.

4.2.1 Initial Exposure to a Profession before Entering Formal Professional Education

The research set out to explore and to identify whether the participants have already been exposed to the profession before they started their formal professional education. As previously discussed, they may have already been exposed to the profession since childhood through socialisation processes and thus may have begun to form some values of PI or identification with the profession.

When the new students (NSs) were asked what made them decide to enrol in the professional programme, several factors (some were mixed) affected their selection process at the time. These factors are summarised in Table 4.1.

Table 4.1 Factors that influenced NSs in enrolling on to a degree programme

Deciding factors	Participants
Work experience in construction-related area	***ns1***, ***ns2***, ***ns3***, ***ns5***, ***ns6*** and ***ns7***
People in social circle	***ns1***, ***ns2***, ***ns3***, ***ns4***, ***ns9*** and ***ns10***
Interest in construction	***ns2***, ***ns3***, ***ns6***, ***ns7*** and ***ns8***
Interest and skills in mathematics	***ns1***, ***ns3***, ***ns8*** and ***ns10***

Table 4.1 illustrates that there is more than one factor that influences some of the NSs in deciding on which the area to choose for their degree programme.

Of the six students who have working experiences in construction-related work; two of them work as contractors on site (***ns3*** and ***ns7***), two work in an architecture firm (***ns1*** and ***ns6***), one in real estate (***ns2***), and one has working experience in two surveying companies (***ns5***). Notably, the durations varied from a week's experience to three to four years. Four of the participants (***ns1***, ***ns2***, ***ns5***, and ***ns7***) work short-term (maximum of two months) to experience potential opportunities within the companies. They also use the time to consider whether the work is

compatible with their skill-set and interests. Therefore, based on their experiences, they decide to pursue this route as their future career.

Regarding the other two, one (***ns3***), does not do well in college and work in the same company as his/her father for a few years as a labourer while figuring out what to do next. The other one (***ns6***) work in an architect office after obtaining a Higher Certificate in Building Technology and Management. The participant's experience is that the role is considered less exciting; the participant describes it as "boring". As a result, Participant ***ns6*** moves on to pursue a degree at the university with the hope that more prospects would be available after the studies.

Participant ***ns5*** works closely with QS practitioners in two surveying companies. The participant describes the experience as both enriching and enjoyable as the following quote illustrates:

> *I enjoyed it … I did two months there so like made me know for sure that I really like it but yeah it was working at the two, working with surveyors at these two places made me really want to do it even more.* (***ns5***)

From the quotation above (***ns5***), having QSing-related work experience provided the participant with better insights of the profession and the industry in general, thus providing more confidence for the participant in deciding any future direction. As a result of ***ns5***'s work ethics and engagement, the company subsequently offered sponsorship for him/her to pursue a degree. This offer had since developed his/her keen enthusiasm and motivation, urging ***ns5*** to work hard and acquire a professional qualification. This enthusiasm was echoed in the following statement:

...seeing someone get so far in such a good profession, it is like motivational. Obviously he wouldn't got that far if he didn't have his chartership. Everyone on the team was either working towards it or had it. So yeah, I didn't meet anyone who wasn't working towards it. (***ns5***)

The practitioners became a role model for this participant, through their approach and support during the duration of work experience. This aspect, as postulated in the research framework (Section 3.3.3), is one of the factors that influence PI development. Participant ***ns5*** only recently started a degree programme, but having worked as a QS alongside professional QSs, PI his/her attributes had already begun to develop.

4.2.1.1 The Definition of a Professional: Participants' View

NSs were asked to describe the term 'professional' in order to identify how they would conceptualise the term and whether their understanding of the term is similar to the concept of PI in the existing literature. Below are three of the participants' responses:

Behaving in the right way like treating colleague with respect, not going too far […] dressing properly, addressing people formally and not overstepping the line. You know where the line and don't cross it. (***ns5***)

They are very proper when they do things. They did things by the book [...] it's a mannerism and of how they approach situation […] they know what they are doing what they are there for […] go by a set of rules that they got to oblige […] know he's gonna work towards something and knows what he's talking about so there's always a respect there. (***ns3***)

Having a career, having a good wage […] showcase like this guy is a professional. He knows what he's doing. I trust him. (***ns7***)

Based on these responses (and others not shown here), two aspects were identified. Some associated the term with the professionals' abilities; others associate the term with the

characteristics and values that the professionals are expected to uphold or portray. Therefore, it is clear that when working in a construction-related area, employees are bound to meet construction professionals who would model the conduct that professionals are expected to possess, i.e. their mannerisms and professionalism.

For those who are still finding their feet in the working world, this portrayal could provide them with guidance, aspiration and motivation in shaping their future identities in the profession. However, there may also be a slight risk as some of those professionals might have social and economic interests of their own. These personal interests can overrule the interests of those they serve, particularly their clients who are inexperienced in dealing with the construction-related business (Bessant, 2004). These portrayals would still provide guidance to the new recruits but may have different moral and ethical aspects.

4.2.1.2 Summary

The analysis of the results revealed that initial exposure to the profession is either through work experience in a construction-related area or from people in their social circle, or both as discussed in Section 4.2.1. The exposure, especially in work, can create professional values or characteristics or work traits (i.e. PI) even before the participants begin their formal professional education. Durkin (1995) suggested that these attributes if combined with other exposure during formal professional education, would integrate into one's personality traits, and become part of that person. The findings also found that most NSs expressed their active involvement in the profession selection process before they started their higher education journey. This finding aligned with Cohen-Scali (2003) who asserted that professional socialisation could begin as early as childhood, particularly in adolescence. Cornelissen and Van Wyk (2007), in addition, suggested that the process begins as soon as the students decide on a career.

The next section investigates the impact of the start of their formal professional education and addresses the question of, "Is there be any differences between those who began their professional education with an existing PI compared to those who are yet to acquire their PI?"

4.2.2 Formal Professional Education

Section 4.2.1 observed that several students, especially those who had previous working experience in the construction industry, were showing some associated traits. This section presents the investigation into the impacts or differences between students who started their formal professional education with and without existing PI attributes. It also discusses how students go about their learning and career preparation process and identify how educational experience plays a part in the development of PI. As the study uses a cross-sectional design, the NS participants were not part of the discussion in this section as they have yet to start their learning. Therefore, the results for this section only concern the FYSs.

4.2.2.1 Final Year Students' Initial Exposure to the Profession before Formal Professional Education

Similar to the NSs, there were also several factors (for instance some are mixed factors including interest in construction and specific subjects like mathematics and law) that made the participants from the FYSs chose the QSing path. These factors are summarised in Table 4.2:

Table 4.2 Factors influencing FYSs in enrolling into a QS degree programme

Deciding factors	Participants
Previous work experience	***fy1***, ***fy2***, ***fy3***, ***fy6*** and ***fy10***
Interest in construction	***fy3***, ***fy5***, ***fy6***, ***fy7*** and ***fy9***
People in their social circle	***fy2***, ***fy3***, ***fy4***, ***fy7*** and ***fy8***
Prior education: diploma in the construction-related area	***fy7***, ***fy9*** and ***fy10***

As illustrated in Table 4.2, for some participants, there is more than one factor that influenced their decision.

Previous work experience

Two of the five participants (***fy1*** and ***fy10***), who had prior work experience, were already in full-time employment before they decided to enrol in the QS degree programme. One of them (***fy10***) had previously worked three years with a QS consultant performing QSing-related roles and tasks. The reason for enrolling in a degree programme was due to the requirements of professional qualification. The other student (***fy1***) on the other hand, said that architecture was no longer appealing and was thus looking for a different route; his or her reason for choosing the QS programme was:

> *First of all, the job. I have to be honest with you because I could choose other options as well but I decided to go for a course which could provide me a better opportunity to get a job because if you take a look at my age you will notice that I'm in desperate need of the sort of a good job […] and also QS, in my opinion, is a sort of straightforward field of study which is good.* (***fy1***)

Participant ***fy1*** added that, apart from having a better job opportunity, the QSing field was also more "straightforward". Hence, that would make it easier to study compared to architecture. Besides these two, three other FYSs (***fy2***, ***fy3***, ***fy6***) also had some experience working in the construction industry; one FYS (***fy3***) worked as a site operative and with this experience and through his/her observation of professional QSs (father's friends) the student stated that the profession:

> *...was quite materialistic and there are quite good money with it, and I thought oh that is something that I think I'll enjoy and do and I fascinate about construction, and it pays well which is always a great benefit…* (***fy3***)

This quotation made it clear what motivated this student to pursue a QS path; one was monetary benefit, and the other was the interest in construction.

Participant ***fy2*** had been helping their father, who was a contractor, with his work. Initially, this student was unsure about which programme to study at the degree level. After being advised by his/her father to pursue the QS route and doing his/her own background research, the student enrolled in the programme.

The third student had worked at a QSing firm when he/she was in Year 10 (during school time):

> *I wanted to understand the construction sector, so I was looking around the different jobs. I came around QSing, so I looked more into it and I thought I might go have work experience and see what it's like and I enjoyed it so that's how I came around.* (***fy6***)

The response from this participant was similar to that of ***ns5*** that was discussed in Section 4.2.1. Both of them had obtained work experience in a QS firm, and for both, the exposure had given them a better insight into the profession (including interest in the construction for ***fy6***) that would consequently make them decide to pursue this route as their future career. Five participants from the FYSs (***fy1***, ***fy2***, ***fy3***, ***fy6***, and ***fy10***) already had a preconceived idea of what the QSing profession is. They also started developing their sense of professionalism from their work experience, especially Participants ***fy6*** and ***fy10*** who had direct contact with QS professionals through his/her work who provided him/her with better insights about the roles and the profession.

Prior education: diploma in the construction-related area

Three participants (***fy7***, ***fy9***, and ***fy10***) had prior diploma-level education in construction-related disciplines. One of them (***fy10***) had experience working in a QS consultant office based on that qualification. Even though the other two (***fy7*** and ***fy9***) did not have any work experience, their educational background allows them to have some understanding of the construction sector. For one of them (***fy7***), having an interest in construction and mathematics meant that QS would be a good option for him/her as it is a balance between the two. The decision was made after seeking advice from family friends who work in the construction industry. The other participant (***fy9***) was initially enrolled in a construction management programme. However, after a year of being engaged with QS-related work, they decided to switch to the QS programme, stating that:

> *...QSing seems to be more me...* (***fy9***)

This statement inferred that this student might already have identified him/herself as part of the profession due to the work experience. The other reason was that, due to his/her work commitment and engagement, the company offered the student a job as a contract manager. ***fy9*** said:

> *So it's not really much point in me studying construction management now...* (***fy9***)

The job offer that he/she received showed that Participant ***fy9*** must have done an excellent job during the year and had also attained QS-related knowledge and skills from the work experience.

People in their social circle: suggestion made by the participants' fathers

Similar to Participant ***fy2***, ***fy4*** and ***fy8*** received suggestions from their fathers about the selection of the programme. Like ***fy2***, initially, Participant ***fy4*** did not have any idea about which course to choose, thus enrolled in the QS programme based on their parents' suggestion. Participant ***fy8*** said that the suggestion was the first time he/she had heard of the QS profession. What appealed to them was the profession's reputation and that the career path seemed interesting and involved mathematics, which interest them.

Area of interest

Similar to Participant ***fy8***, Participant ***fy5*** also chose the QS path due to associated areas of interest. He/she was initially unable to decide between accounting and engineering but found that the discipline involves a mix of both subjects. The fact that it also encompasses construction technology and law elements further interest the students.

Responses from four participants - ***fy2***, ***fy4***, ***fy5***, and ***fy8*** - indicated that, among they were FYSs, they at least understood the QSing profession and construction in general at the start of their QS degree programme.

The FYSs' path in deciding their degree programme was quite similar to the NSs based on collected data. The investigation of these two categories of students revealed that a number of them already had PI attributes especially those who had prior work experience and especially those who were involved directly with the professionals (either through work or connection with them). Therefore, would there be any differences between those who have had PI attributes and those who have not, when they embark on their professional learning stage? The next subsection discusses this area in relation to the students (FYSs) who had begun their formal professional education.

4.2.2.2 Final Year Students' Engagement with their Learning

This sub-section explores how students engage with their learning and how professional education programmes can help them identify with their future profession. According to Cohen (1981), this stage is an introduction platform to the profession that includes the acquisition of knowledge, skills, values and attitudes required by the profession. HE or universities are believed to be having an impact on professional careers (Page, 2005). Jackson (2016) suggested that students may be preparing for their future career during this stage, so the notion of employability is linked to the construction of PI. According to the author, this identity will help students prepare for work.

4.2.2.2.1 Developing Understanding of the Profession

Based on all the participants' responses during the interviews, it became apparent that the FYSs who had started their educational programme without or with a limited amount of work experience (especially QS-related) have very limited conceptions of what the QS profession is all about. After enrolling and being on the programme for a while, two of them said that:

> *…at first I did struggle a bit because I don't know if this is the right thing to do […] what I want, but then after the first term I guess I quite like, interesting as in you can do, you learn about the construction and know the process and then you get to do some math and then contracting. I think it's quite diverse…* (***fy4***)

> *What I learnt in the first year […] I don't think it is related but now I know it's related […] now what I'm studying is more practical for example when I learning about contract management or some statutory law I feel like I'm more involve with the role of being a QS [...] approaching me to be a QS.* (***fy8***)

From these responses, it is clear that learning did provide them with such understanding and, as their learning process continues, their knowledge, skills and interest also developed. They were then able to identify and make a connection with their future career and realised the usefulness of their programme of study, as well as discovering personal traits (interest and ability) that fit the profession.

Participant ***fy7***, who already had a Business and Technology Education Council (BTEC) diploma in construction said:

> *I roughly knew about QS then before coming to university but I still didn't have a great idea, but then when taking the course at Reading I had a greater understanding of being a quantity surveyor, and a degree does teach me and drive me to wanting to be a quantity surveyor more by knowing about the role more.* (***fy7***)

As suggested by Weidman et al. (2001), even though some individuals may have preconceived ideas of what their chosen field is while learning about their profession, their views might be modified as they learn more. Given the responses above (particularly ***fy7***), the suggestion could also apply to those who have no preconceived idea about the profession and show how learning not just modify their views but also reassured them that they were on the right track. From the three quotes (from ***fy4***, ***fy8***, and ***fy7***), it was also evident that knowledge and skills acquisition promote identification with the profession, making them better able to relate what they have learnt with their future career (Trede et al., 2012).

4.2.2.2.2 Identifying with the Profession

Based on the university's website (University of Reading, 2017b), the programme's curriculum is structured in such a way that in the first two years, students would be learning generic construction-related modules where all the students, regardless of the specific programme pathways that they enrolled in, have the same modules or subjects. It is only in the third year that they have discipline-specific modules. However, it is not clear how this arrangement impacted the students. One participant mentioned:

> *To be honest, I don't feel any different because the first two years doing basically the same modules and the third year is no different because even if they're building surveying they could take our modules so it doesn't really differentiate exactly whether you are QS, BS or construction management in my opinion…* (***fy5***)

As the structure of the programme allows other students from different courses to take the QS modules and be in the same class, Participant ***fy5*** did not feel any different from the others, even in the third year when they can specialise.

There are reasons for this type of curriculum arrangement. One is probably due to the fact that the graduates would eventually be employed in a variety of organisations and situations. Kavanagh et al. (2010: p.11) claimed that the "university setting cannot help but be too artificial and are abstractions from 'real world' conditions". The other reason would be due to the multidisciplinary nature of the BE sector and the construction industry. This characteristic requires universities to try to instil multi and inter-disciplinary working skills in their students, and this is reflected in the programme's curriculum arrangement.

Nevertheless, it is noted that being on a QS programme and learning and training to be a QS makes the QS students instinctively assume the role of a QS as this quote demonstrates:

> *...when we are in a project, the QS tends to line more towards the cost part. That's what I did realise. I think it's the way we think our priority in the project [...] this stuff just came naturally without me realising it until a group of BS kind of "look at the QSs". I think it kind of became a part that I didn't realise myself until someone pointed out.* (***fy5***)

According to another student:

> *The projects don't really have a defined QS role […] you'd be what you want […] I'm not QS for all the time […] I feel what makes me different probably from other students is I think we are more cost conscious…* (***fy4***)

These two quotations showed that the QS students were subconsciously thinking and acting as a QS during the project's activities. This scenario illustrates that, regardless of the curriculum arrangement that requires students from different programmes to learn together, these two showed that they were still able to identify with their future profession and role and differentiate themselves from other students. This aligns with Trede et al.'s (2012) assertion about PI characteristics. In Participant ***fy5***'s case, it was probably due to being a sponsored student:

> *I'm a sponsored student, so I will have to go back to work as a quantity surveyor for sure.* (***fy5***)

The sponsorship determined the student's future direction and probably influenced their learning, and consequently strengthened the internalisation of professional characteristics. As suggested by Sherlock and Morris (1967), accepting sponsorship can create a sense of responsibility that results in a deeper commitment.

The two quotations from ***fy4*** and ***fy5*** suggested that, as students go through their educational programme, they learn more about the profession, i.e. gaining more about the discipline's knowledge and skills, and getting more involved with the profession; they wrap themselves in their PI. Their experience made them intertwined their personal identity with their PI (Ronkowski and Innaccone, 1989) as illustrated by Participant ***fy5***:

> *...if me and my classmates doing the same course, when we go out for a day trip, our conversation tends to line more towards the construction so sometimes look at those building then we're discussed about it but I wouldn't know, I'm not sure if that an identity.* (***fy5***)

This statement indicates that their PI (the participant's and the classmates') had subconsciously merged the identity into their daily life. However, when asked to describe PI, this is Participant ***fy5***'s response:

> *Maybe it just my type of person that I'm not extremely confident so I don't always feel like I'm fully prepared. There's always so many more things to learn and things that even though you get the best grade out of your degree it does not necessarily reflect in how well we were initially cope with settling down in our profession and that's what I think. So I don't feel like a full identity but first thing because I haven't got to that stage yet so it's just what I'm expecting right now is I'm not fully prepared with the identity to lead the project and be a QS.* (***fy5***)

The first two sentences of the above response (***fy5***) inferred that the student got that impression probably due to the nature of the programme that only allows them to specialise in the final year. Learning about your future career's specialised area in just one (final) year might not be enough for the students to gain as much knowledge as they possibly can. This small exposure is probably why this student (***fy5***) does not feel confident in their own abilities as a soon-to-be QS practitioner or professional. The feeling of not being fully prepared may also be due to being a sponsored student. This factor was supported by Sherlock and Morris (1967: p.38) who

indicated that “sponsorship can create a sense of obligation to live up to the expectations of the sponsor”. The expectation from others (i.e. future employer or colleagues) is probably another aspect that might add to this perception. Moreover, in the Participant's (***fy5***) home country, those who have been doing QS-related work are not qualified QSs; they are engineers that have been transferred from other departments. Thus, the student would be one of the first QSs to be appointed, thus adding to the burden of expectation and responsibility.

4.2.2.2.3 Identifying through Industry Placement or Internship

Students usually went for an internship or placement during the summer holidays in their first and second years. During this time, they had not yet learnt much about their programme-specific area, as previously discussed (Section 4.2.2.2.1). Thus, the knowledge and skills that they had were the general concepts and principles of construction. This situation is affirmed by a comment from Participant ***fy5*** as follows:

> *The thing that I’ve found the hardest was what I learn and when I actually went to some internship about actually working future as a quantity surveyor is totally different.* (***fy5***)

Therefore, when any such students were offered an internship in a QS-related company, working with QS professionals and doing QS-related tasks, they did not have sufficient QS knowledge and skills yet to assist them. The lack of these two aspects would probably be the reason why a number of them considered that what they learnt in their first and second year of the degree programme were not as relevant to their future career. However, several students saw the placement or internship as an opportunity to optimise their time to gain extensive experience or knowledge as they could about the QS-related works and learn from the QS professionals themselves. Therefore, how they perceived the relatedness of their learning to practice depends on how they manage their work exposure and experience.

Despite this, a number of FYSs, on the other hand, mentioned the importance of work placement or internship as it helped them to be more engaged not just with their learning but also with the profession and practitioners or professionals as quoted by these students:

> *I think work experience really help because when you are QS you doing a QS job then you feel like but obviously you will feel more when you achieved something like you manage to finish a task and then you learn something through the process then like then you feel that yeah you are a QS.* (***fy4***)

> *…when I was actually in my internship I actually take the initiative to ask the people actually working there I think that for me the quickest way to get the insight about learning how to do it…* (***fy5***)

> *I've done a summer placement in second year and also this year […] so I learnt a lot in office and learnt what it feels like to be like in a work environment [...] quantity surveyor actually does out on foot.* (***fy7***)

These quoted showed that work experience provided them with a more precise view of their future direction and consequently fostered their PI development. By doing a QS-related job or tasks, the students felt more connected and could picture himself or herself as soon-to-be a QS. As postulated by Trede (2012), it is quite common for students to seek certainty or assurance in real working practice. The exposure will make them feel the connectedness with their future roles. The findings revealed that students started to develop knowledge and skills related to the profession and become more motivated when they could exercise the abilities that they gained in the real work context (practice) and gained from the knowledge and skills learnt in their educational programme. Work exposure made them realise the kind of skills needed for the profession and the roles or skills that may not be taught at the university. As one student explained:

The skills that you need to have. Yeah, so I think great personality skills, people skill is really keys from what I've got from speaking to people I've worked in the industry [...] you should be independent being able to go away and do things on your own and independently so crucial in higher education and in works [...] also being confidence enough to go and ask for things as well. (***fy3***)

This response indicated that knowing what the professional field is like enable students to consider their learning holistically. Participant ***fy3*** acquired the insights from interaction with the practitioners or professionals during a work placement. This engagement was aligned with Weidman et al.'s (2001) view that the interaction provided students with an opportunity to learn and be mindful of the appropriate attitudes of a professional. Another student (***fy2***) stated something similar:

I've seen the hard work and the knowledge that you need to be a QS and I know a few people who is QS and they are well-established and they really like their job and passionate about it and that makes me want to be passionate about QS as well […] encourages me. (***fy2***)

The quotation above was a clear indication that by observing working practitioners, Participant ***fy2*** had begun to understand how they behaved and how they felt about their work, i.e., insights into their ideology, motives and attitudes. On the other hand, the following statement by Participant ***fy3*** shows that observing academics can also play a significant role in students' PI formation:

I must say I got blown a bit by Professor R. I mean seeing what he achieved I don't know if he really done it anything he's done everything like you can possibly do so certainly him. Listen to his story […] what he's achieved you certainly want to achieve that as a quantity surveyor. Well he is initially an engineer or something like that then he went into QS [...] he definitely is a role

model that sort of inspires me to want to become a QS. Fully pledge QS and progressive even further than that. (***fy3***)

From their observation, these two students (Participants ***fy2*** and ***fy3***) identified with being mentored by experienced members of the profession. The academics and practitioners that they mentioned became the students' role models who motivated and inspired them and thus promoted the sense of identification with and commitment to the profession. Moreover, interaction with the role incumbents as described by Weidman et al. (2001), provided an opportunity for the students to be aware of the attributes of the members of the profession which might inspire them to adopt similar characteristics. Based on the observations and interactions with the role incumbents, the students could develop images of what they think, and feel will be expected of them. They then might try and start preparing themselves for what they presume would be their future role.

Involvement with work and participation with practising professionals and academics, as previously mentioned, provided opportunities for the students to become aware of the relevant professional attributes which consequently motivated them to be part of that community (Weidman et al., 2001). Once the students start learning, they began to understand more about their chosen profession, made aware of their capabilities and ability to assume and perform the role and be part of the profession. They would personally assess their knowledge and skill throughout their educational programme, a process that might influence the outcome of their educational training.

4.2.2.2.4 Impacts of Formal Professional Education

The overall findings illustrated that, during formal professional education, the students' understanding of the profession and professional roles started to evolve. These insights were echoed in their responses when asked whether their education helped them prepare for work:

> *...uni gives you some idea as in what do you expect at work...* (***fy4***)
>
> *...a clue of what's going on...* (***fy3***)
>
> *...it helps me with the skills to prepare for the work...* (***fy5***)
>
> *...we do projects and stuff so there's some guidance of like how you be working in a team, what sort of QS role you need to do and apply...* (***fy2***)

Therefore, by gaining knowledge, skills and understanding, the participants (particularly ***fy3*** who "fell in love" with the profession) will enjoy the discipline even more. Not only that, as the students learnt more about QS-specific areas, the knowledge and skills that they gained made them feel that they were capable of and more involved with the role of being a QS, mainly when they can practise and use those skills in the projects module and work placements or internships. What they learnt in their third year (QS-specific modules) and the experience that they gained during work placements made them realise that the knowledge and skills that they acquired are relevant and could be used in their future career. Therefore, the growing understanding and ability, combined with the work experience, made them feel more connected to the profession and more confident in their abilities to become a QS.

Image shifting might not have a sufficient impact yet as there were five FYSs who described the profession in general instead of relating it to their identity in relation to the profession, as illustrated in Table 4.3. Table 4.3 is based on the participants' descriptions of the characteristics of a QS.

Table 4.3 illustrates that even though the majority of FYS participants still think that they do not have PI yet (from their responses during the interview), what they described closely depicted the QS profession. The data were an indication that these students were already identifying themselves with the profession.

Table 4.3 FYSs' descriptions of their PI

	PI description	Characteristics
fy6	*...we are like **construction accountant** almost so like we're more towards money side and try to manage the costs of building projects so that's how I put it. Construction accountant almost.*	**Profession traits or future roles.**
fy7	*...**cost management in construction projects** and basically managing projects and over the costing side of it.*	
fy8	*...the **cost management** and **dealing with the contract** for the construction project...*	
fy9	*...someone, **controlling the cost**...*	
fy10	*An **accountant for building** [...] they work in law involve in dispute resolution definitely not only in construction industry [...] you can work for subcontractor doing calculating rates and all [...] you are professional in the industry...*	
fy2	*...the **knowledge** that you need to be a QS...*	**Personal abilities.**
fy3	*Yeah, I'll say so yeah. I've also got **a bit more experience** then I'll say I am yeah.*	
fy4	*Not yet for me as student [...] but **QS student** yeah.*	**Identity as a student.**
fy5	*Not yet as in **I'm still a student** but identity as in what I found is [...] me and my classmates doing the same course [...] our conversation tend to line more towards the construction [...] discuss about it but I wouldn't know, I'm not sure if that an identity.*	
fy1	*Just after finishing the course? **Definitely not**. What we've done so far, it doesn't give that much confidence to be honest with you.*	**Not yet.**

The data also indicated that having a prior PI or lacking such identity before they started their formal professional education did not have any impact on the students' commitment to their

study and the formation of their PI. This outcome is due to the ability of the individual students to understand the gained knowledge about the profession and how that may or may not match with their personality and interest, and their future direction as echoed by this student:

> *I've always enjoyed numbers and I like this financial side of things knowing what things costs, being able to manage that yourself and combining that with construction itself which is so interesting and the opportunity it actually brings…* (***fy3***)

Therefore, after considerable contemplation, they would then carry on with their learning based on the evaluation made (the compatibility of their future profession with their personality and capability). For instance, Participant ***fy9***, who had initially enrolled in the construction management programme decided to switch to the QS programme for the final year after working in the industry for a year. This scenario illustrated that exposure to learning and practice could make a student re-evaluate their initial choice. If it does not fit who they are, and their ability or they did not see it as their future direction and whom they want to become, then they might consider other options and eventually decided to do something else (Jebril, 2008).

4.2.3 Summary

The development of PI during formal professional education in this research is not very apparent despite the findings by Jebril (2008). The author identified that the construction of PI is at the highest level during the learning stage. However, the participants' responses during the interview indicated that they had a relatively clear picture of what the profession is and the roles of QS professionals. The formal professional education did help them identify with the profession, and work experience defined it more for them as they can relate what they have learnt, with their future career. The analysis also showed that the students were constructing

their PI in relation to work traits and qualities like knowledge and skills, thus suggesting that it is a process of individual development.

It is also worth noting that the emergence of professionalism and PI is indeed an individual journey as the FYSs had differing opinions on their learning experiences and what they learnt and gained during this period and the impact of learning on them individually. As argued by Hunter et al. (2007), PI development will be up to the individual students themselves as they are the ones who need to take ownership of the process in developing their professional selves. This factor was also evident in their sense of preparedness as their responses showed that identification and commitment to the professional role were not fully achieved during the professional preparation stage. This supported Cornelissen and Van Wyk's (2007) findings who claimed that the process would continue to evolve when the students embark on their professional role, i.e. socialisation by work. This socialisation stage is discussed next.

4.3 Socialisation by Work

This second dimension represented one's self-integration into work that includes making a transition from the learning stage into the professional stage and gaining professional experiences. Learning does not stop at university or HE as the practice is also a very valuable context for learning as it includes acquiring and sharing technical knowledge (Jackson, 2016). The first part of the discussion will focus on the transition and how socialisation for work helps during the process. The later part presents how the experience impacted practitioners or professionals.

4.3.1 The Transition and Professional Experiences

The stage that occurs when graduates embark on their careers and build upon everything that they have acquired about the profession during their learning stage is called organisational socialisation stage (Tierney and Rhoads, 1993). As previously discussed in Section 4.2.2.1, all ten FYSs had work experience either before or during their professional education. This experience included work placements or internships that most of them did during the summer holidays. This finding is also similar to the NPs as all ten of them had prior work experience. During the transition stage, two of the NPs said that:

> *I think because of the placement, it's being a lot easier and I think uni made it a lot easier to push you to do placement because it gives you a lot of opportunities…* (***np2***)

> *I worked for the university, so it's not been a completely new experience to me to be a full-time employment.* (***np3***)

These statements showed that previous work experience helped the graduates in their integration into practice. What they gained during those periods is an understanding of what it means to work in the industry or to be a member of an organisation (Sweitzer, 2008) or be part of the team. During work experiences, they may be able to practise their understanding and the skills acquired, thus making them feel more confident to assume the role.

4.3.1.1 Perceptions of Formal Professional Education

This professional stage may also reaffirm what graduates learnt during their undergraduate study on how beneficial it was to them now. One participant recalled:

> *I think at uni [...] even after three years, you don't think you know very much, but actually taking the theory that I learnt at university and bring it into the job that how much you actually know and how beneficial the course actually was [...] quite a lot of people when they leave uni, they are sceptical of how they didn't learn very much, and I just did the work because I had to, but actually, in hindsight, it was a lot more beneficial than I thought. A lot of my friends said the same. I think you appreciate what you have learnt when you have a chance to use it which is really good.* (***np1***)

This statement indicated similarity with what was previously discussed where each student (including graduates when they were students) had different opinions about their learning acquisition and experience. Consider Participant ***np5***'s view:

> *I think that my educational programme showed that I can learn well but I don't think it was necessarily that well suited in the industry […] not much of it is necessarily applicable. That sounds a bit harsh […] I think it was useful in kind of give me some drive, self-determination but I think the issue with it is every single job is different so there's probably some jobs out there where the degree was tailored perfectly for it…* (***np5***)

Even though Participant ***np5*** thought that the understanding and skills gained from education were not particularly relevant to practise, the statement revealed that there were other values to be obtained. Those values included the ability to learn as well as the motivation and self-determination which are very relevant in the world of work. Participant ***np3*** said:

> *...the things we do right when we start out, the basic skills of QS that you didn't do much of. That is how I felt anyway, but those are the things that you'll learn when you start the job anyway and also the things the real actually from industry [...] so when you do start, everything is set out to teach you from scratch.* (***np3***)

The question remains whether the industry perceives that they have to teach the new graduates basic knowledge when they join the workplace. One of the interview questions posed to the CQS was the challenges that the participants had to face so far in their professional role. Two of the participants (***p3*** and ***p8***) mentioned the quality of graduates that they received had been decreasing over the years. Therefore, they had to prepare an intensive training programme as commented by Participant p3:

> *I am not prepared to let some of them lose in the world who's gonna be a problem. So that is the biggest challenge we have...* (***p3***)

However, not all companies or organisations are ready to provide intensive training. Thus, the feeling of being prepared for future professional work varies between students or graduates, and this might be due to where they work as well. If their workplace provides them with additional training, then they would not have felt much pressure to utilise the knowledge and skills that they acquired during their formal professional education. If this is not the case then as a newcomer, they would undoubtedly feel inadequate, which would affect their confidence and self-esteem. These quotes (***np1***, ***np3***, and ***np5***) also showed that individuals bring to work different levels of experience and expectation that may influence how they make sense of their socialisation experiences (Trice, 1993) and how they will proceed.

4.3.1.2 Engagement with Work

Once the NPs had been involved in QS-related work on a daily basis, their fundamental understanding and skills started to develop even more as illustrated by this NP who has been working for three years:

> *Getting on site experience is a key because when I join the rail sector, university did not cover anything on network rail. So it was new to me so when I was on site learning about the rail as an industry, what work involved, to be able to deliver [...] to achieve the company's goal. Able to maintain the profitability and the commercial aspects of a project. It is key to have the onsite experience [...] be able to monitor cost properly [...] to have a bit of the view of the value side which is what you need to get for the client...* (***np9***)

The statement showed that, in the workplace, newcomers would start to identify and understand the norms and expectations of their new environment and future profession (Austin and McDaniels, 2006). They would pay attention to learning new work-related tasks in the first four years of practice in the establishment stage of their career. As they learn more and develop their knowledge and skills, they would have the confidence and be trusted by their organisation to manage a project on their own as affirmed by this participant:

> *I've been given two sets of projects [...] they're my projects and my name on them, my responsibility. So if things get behind, it's me who's gonna get a flak for it and yeah that's almost not stress but the fact that it might if I don't do my job. Things aren't gonna get done, and it's nice to have that responsibility and be trusted with it essentially. Yeah, I think trust is a big one that trusts to do my own work inspires me to become better at what I'm doing, so that is good. Yeah, being given my own work is a big one.* (***np5***)

This response showed how engagement with work would eventually lead to better identification with the work and the professional role. Based on the previous answers during the interview,

this Participant ***np5*** commented on the current lack of technical understanding. However, from the quotation above, it is evident that, despite their perceived inadequacy, the company still entrusted the participant with the responsibility to manage various projects. The excerpt indicated that the company trusted Participant ***np5***'s capabilities in assuming the role. These two quotations (***np9*** and ***np5***) illustrated that the process of identification and commitment to professional role continued to evolve when graduates start work and immerse themselves in their new position. New graduates continue to learn new skills and learn how to be expert in their work area, and, with practice become better at their job, as Participant ***np10*** explained:

> *I've improved mostly by actually doing just the day-to-day QS. Know how much that cost in a nutshell [...] I'm better at pricing work, but my construction tech knowledge has also improved as a result to that. I understand far more about buildings and construction […] my health and safety knowledge is improved...* (***np10***)

Thus, their daily experiences in their role intensified their passion towards their career as shown by the following quotes:

> *…honestly I love my new job. I actually love it. I find it very interesting. I find it easy in a way to learn something this way. So when I was learning at uni, it's becoming real and it actually cement in my mind now that I know certain thing.* (***np3***)

> *I enjoyed working with numbers now more than before...* (***np6***)

Their fulltime involvement with their roles and the experiences that they gained enhanced their PI.

4.3.1.3 Preparation for Chartership Status

During this early stage of their career, they started to develop their ability and at the same time prepare themselves to become an official member of the profession (professional qualification or chartership). When asked about what the status means to them, here are some of their responses:

> *I mean it's everything. I think as soon as I started university I knew that that was sort of the next big hurdle after graduating. That's the way it's been the focus [...] there are very little QSs who are practicing who aren't chartered. It just is so important for career progression [...] involve with more important projects. It just having those 4 letters after your name and people know that you spent two years developing yourself as a QS just its critically important.* (***np1***)

> *...my whole goal was to eventually become chartered once I started working [...] be recognise the fact that you reach a certain level and you also can go and work on your own if you want to […] also open up the avenue of work if want to go elsewhere they will know you have a certain standard on what to expect from you.* (***np10***)

These responses illustrated that becoming a member is part of their goal, and this further motivated them to increase their engagement with learning and affected the level of commitment to their work and role. PI is viewed as an on-going process of interpretation and reinterpretation of experiences (Beijaard et al. 2004). It does not answer the question of "who am I at the moment?" but who I want to become (Beijaard et al. 2004). Therefore, when graduates knew what they wanted to be, they strived to be included in a new professional community and subsequently become a full member.

For the assessment of professional competence (APC), level one is about knowledge and understanding. Level two is being able to put that knowledge into practice, and level three is

focused on reasoned advice and depth of technical knowledge (RICS, 2015). Therefore, if the novices were engaged with their learning, they may have covered some of the areas in level one which will be very beneficial as they can focus more on level two and three once they have started working in full-time employment.

4.3.1.4 Awareness of QSs' Moral and Ethical Responsibilities

Preparing for professional qualification made them aware of the moral and ethical responsibilities of accredited professionals. Thus, approaching them would allow the NPs to be identified with members of the professional body, i.e. the members of the RICS. Table 4.4 illustrates the response from NPs in relation to RICS professional and ethical standards. It must be noted that during the interview session, the NPs were not introduced to these RICS standards.

Table 4.4 illustrates that, since they are preparing for their APC, the NPs were able to describe and associate the QS moral and ethical responsibilities with the RICS professional and ethical standards. Three NPs specifically mentioned RICS when they responded to the question posed to them as illustrated below:

> *I think obviously there are moral ethical responsibilities because obviously the RICS has quite hard on that...* (***np6***)

> *It depends the way you look at it because if you talk about the ethical if you look at the RICS organisation and what they refer to ethical mostly that's what we actually referring to the question...* (***np9***)

> *The RICS set out the ethical guide...* (***np10***)

As Participant ***np10*** had been practising for more than three years and probably had been preparing more for the APC, this participant's response was similar to those of the RICS ethical standards.

Table 4.4 NPs' perceptions of the moral and ethical responsibilities of professional QSs

RICS PROFESSIONAL & ETHICAL STANDARDS	Novice practitioners' descriptions
Integrity: honest, straightforward, trustworthy, open, transparent, unbiased, undue influence, public interest	***np2***– fair, not ripped people off, honest, modern slavery ***np4***– not given a job to a friend, avoid questionable position ***np5***– no bribery, transparent; not using people or taking advantage ***np6***– no bribery, public project; money is going to value ***np7***– making sure nothing outside the project influences our decision ***np9***– open, honest, integrity ***np10***– no bribery, be in questionable position
High standard of services: best possible advice, support or performance, within scope of competence	***np1***– look after the client, deliver project to the best of ability ***np6***– being the best to the client ***np7***– the best interest of the clients as employed by them ***np9***– always provided high quality of service ***np10***– high level of responsibility for service to the client
Promote trust - firm or organisation: professional and private life – highest standards globally, actions affect others & environment, fulfil obligation	***np1***– making sure that project is sustainable ***np3***– understand obligation ***np6***– uphold value to human act ***np9***– professional manner, to behave in order to promote yourself & your company; build a reputation to the client
Treat others with respect: courtesy, politeness, respect, considerate	***np1***– respect client & everyone ***np6***– acting in a way that doesn't hinder others, team environment ***np9***– treat people with respect
Take responsibility: accountable, act with skill, care & diligence, respond in appropriate & professional manner, suspecting – prepare to take action	***np3***– be up to date, taking serious what learnt & apply for decision making process

4.3.1.5 Identifying with the Profession

Considering the fact that the NPs have been involved with the work and the role of a QS on a daily basis while preparing for the APC as well, they had started to develop more awareness and knowledge of the profession. This awareness might also be the reason why Participant ***np9*** declared that having a chartered status would add value to his/her role as a professional and the profession in general. The comment made by Participant ***np9*** is as follows:

> *... it basically promotes professionalism and knowledge. So don't take me wrong, if you are not chartered, that doesn't mean that you are not good enough [...] it shows that you are willing to put the extra effort, extra time to go the extra miles and you become part of the professional recognised body that it basically is proud to have a high-quality members [...] know how to take responsibility. How to behave in front of client and just be able to basically an example to follow.* (***np9***)

This response showed that Participant ***np9*** was trying to distinguish between having a chartered status compared with those who did not have it, thus highlighting an identification with the professional body.

On the other hand, Participant ***np7*** acknowledged the fact that the reputation of QSs, compared with other professions (architect or engineer) within the industry, is virtually non-existent hence the need to raise the reputation of this profession. This participant claimed that despite the amount of work that the QS does, the profession does not receive enough recognition from others, as quoted:

> *...my goal personally [...] I really want to put QS up there. I don't feel like we get enough acknowledgement; QS as a profession in general. That's my honest opinion [...] we put a whole lot of things together as well, it was surprise that QS understand more than architect because we have looked up around the whole life cycle approach I think.* (***np7***)

The statement inferred that Participant ***np7*** had developed an attachment to the profession, thus wanting to promote it and making people in the industry acknowledge the importance of the profession. This sense of attachment could develop through the socialisation process (Caza and Creary, 2016). Moreover, when questioned regarding the rumour that building information modelling (BIM) will take over the role of QS, even though the NPs were still new to the practice, they seem confident that it would not happen, as illustrated by these two participants:

...it is rubbish [...] you still need someone with knowledge [...] to know what numbers you're putting in. Because if you just sitting there with the things and numbers and they are wrong, and you just put in the computer you are not gonna know that what you're putting isn't right [...] that whole sort of making a cost plan process can't be built. You will need a human there at some capacity [...] giving input and give updates and go to site doing valuation you will always need QS… (***np1***)

I think BIM will change the QS role [...] reduce the scale of measure up [...] should be a lot smoother and should take less time and therefore cost less money but it does cause the client quite a lot of money to implement BIM at the start […] the tech is still being developed pretty much. I don't think it will take QS role away [...] you still need QS to check whether it's right or not you can't just rely on computer [...] I don't think it will take over the QS role because it just streamlining it to make it quicker and hopefully more efficient. (***np10***)

These responses by Participants ***np1*** and ***np10*** indicated that as they become more knowledgeable about their profession, they understand its importance as well as the role of a QS. All of these responses (including the ***np7*** and ***np9***) illustrated that these novices had developed a sense of belonging to the profession through socialisation into the profession, as suggested by Hotho (2008). This sense of belonging will lead to a commitment to the profession and professional roles.

4.3.1.6 Summary

All of the responses from the NPs indicated that engaging fulltime with their professional role compelled the graduates or NPs to feel more connected with their profession, thus encouraging them to become a member as soon as possible. During this workplace socialisation, they acquired and internalised the PI and also developed an interest in issues related to their profession. Apart from that, they also took pride in the values instilled by their profession and

the importance of this occupation. These experiences did refine not only their PI but also reinforced it. The accumulation of that experience led to a strengthening of their PI.

4.3.2 Identification with the Professional Body – the RICS

According to Cardoso et al. (2014), part of the PI was the identification with the professional body and how members of that profession see their relationship with their profession and their professional body. The professional body in this study refers to the RICS, the global professional body that accredits the QS degree programme and awards chartered qualification to its members. The status is recognised globally as the mark of a true professional in the valuation, management and development of land, real estate, construction and infrastructure industries. No specific questions were asked about the RICS apart from questions regarding the body's role in promoting PI and sustainability. The findings in this section were gained from what the participants said while answering other questions and how they relate their answers to the RICS as their professional body.

4.3.2.1 Engagement with the Body

For the FYSs, apart from browsing the RICS website for assignment and module-related purposes, and signing up as student members, they were not engaged with other RICS activities. Similar to the novices, their engagement with the professional body when they were students were limited. The APC process seemed to be the only engagement that most of the novices currently had with the body. Among the novices, only one (***np10***) seemed more engaged with the RICS than the others. Participant ***np10*** mentioned that the RICS had set out an ethical guide and rules of conduct that fundamentally set a certain standard for an individual practitioner. In addition, according to ***np10***, one of the initial reasons in pursuing a degree at the university was

because it was accredited by the RICS. Thus, the goal was to become chartered after graduating as stated below:

> *Yes, the whole aim is to become chartered.* (***np10***)

The goal to become chartered had increased their level of commitment to the work. Commitment to the educational programme and the job were also apparent from this quotation:

> *I've done 2 jobs (placements). I just wanted to start work as soon as my degree I suppose I did a degree to get the job so that I never wanted to study and not working in the industry […] I enjoyed it (working). I was quite surprised of how much the degree relates to the job [...] I was impressed by the scale of some the job that I'm working on.* (***np10***)

Based on Participant ***np10***'s responses, it was apparent that they had identified with the RICS (the professional body) and were aware of their future direction and how to achieve it. Therefore, Participant ***np10*** had already established hi/her PI. PIs are achieved "in so far as the individuals project their identity in identification with a professional group, using their ability to choose 'what' they want to be in the future (anticipatory socialisation), and 'how' they want to be" (Cardoso et al., 2014: p.84). Based on this statement, Participant ***np10*** could be considered to have already established his/her PI but might not have realised it yet, as reflected in his/her description of PI:

> *That's a tough question. I would say I'm professional I've attended the RICS event I attended the code of conduct that they held every year pretty much list out what's changed and what's new how to follow it where to find it the reason behind it.* (***np10***)

From the description above, Participant ***np10*** linked PI to the current knowledge gained and to the RICS.

4.3.2.2 Engagement through CPD

Among the CQSs, who are already members of the RICS, one participant said that to stay qualified, the RICS do put some boundaries that its members need to comply with as part of the membership requirements. For example, CPD is a way of ensuring that members stay up-to-date in their knowledge and awareness. Most of the participants agreed that the annual CPDs are useful and the right way of keeping up to date with what is happening and progressing in the profession and the industry. With 56 years of experience and having gained chartership in 1973, Participant ***p4*** said CPDs always brought new knowledge. CPD is part of the membership requirements, but sometimes it was difficult to fulfil the requirements. However, he/she still believed that continuous or lifelong learning has its own benefits, as illustrated below:

> *The RICS has been quite hard on pushing people to keep doing their CPD, which I think is a good idea personally.* (***p1***)

While explaining the key experiences in shaping PI, Participant ***p1*** also mentioned that the institution requires them (the chartered professionals) to get specific mandatory areas of expertise. According to Participant ***p1,*** that requirement somehow "forces" them to learn as well. In addition, one participant mentioned that the institution also forces the members to become skilled in BIM and suggested that they should become project managers in order to achieve such skill. The CPD was one way of making sure that its members remain engaged with their profession and the RICS.

4.3.2.3 Guidance to Professional Practice

RIC members are provided with guidance notes, like the New Rules of Measurement, and standards like rules of conduct and professional and ethical standards. These are not a set of procedures but a guide to the chartered surveyors so that they behave professionally, ensure that their practice and business meet with the RICS's standards and help them whenever they are at a crossroads. According to Participant ***p4***, it is part of the membership that everyone must abide by the rules and regulations of the institution. To be regarded as a professional, the institute has a fairly rigorous review process concerning the performance of its members. Thus, individual members' and practices' action will be reflected in its performance as well. If one of its members faces disciplinary action, this guidance will be part of the document referred to, to determine whether or not that person followed the procedures and reasons for such contravention would be examined. The RICS has established complaint procedures related to improper work ethics which can be lodged when required. In support of this, Participant ***p6*** said:

> *...by complying with the expectation of the RICS, I'm protecting myself and my business […] that would provide clarity around what is included and excluded given the advice.* (***p6***)

Participant ***p6*** added that, by complying with the RICS standards and regulations, if any of the clients questioned a CQS's judgement, the institution would be expected to protect the CQS as a member of the RICS. This benefit distinguished members from non-members. Participant ***p6*** added that if a QS is not a regulated member of the RICS, that person can still call himself or herself a QS. However, there are risks because even with the same moral and ethical obligations, that person can offer advice although he/she may not have the same credential as a chartered member. For instance, if RICS members offer bad advice, action can be taken by the institution:

...possibly be disciplined or even thrown out, and that would have a reputation-damaging effect... (***p7***)

Therefore, it is essential that the profession has a good standing, and it needs to be maintained so that other professions and the member of the public will acknowledge its reputation. This is due to the fact that part of the reasons for the establishment of professions is to safeguard the public (Cartlidge, 2013). Moreover, as members of a professional body, these certified professionals are subjected to the highest standard of care in their practices (Mayer, 1988). Hence, it is crucial that the institution provides an excellent example of society.

4.3.2.4 Improvement to the Body

Some of the CQSs commented that the body needs to undergo some changes. According to Participant ***p5***, the body is:

...too involved in too many things it doesn't need to be [...] the vast majority of its member wouldn't see a difference of what it's trying to do... (***p5***)

Participant ***p6*** said that the body needed to improve its relationship with individual surveyors as some members could not see much of a direct link between an individual and the body. Participant ***p7*** claimed that small practices sometimes fail to feel the connection with the RICS. Participant ***p7*** mentioned that the body only listens to the representative from more prominent practices, and they are not interested in the opinion of smaller practices. These two participants (***p8*** and ***p9***) claimed that the body is centred on the "big guys" and that they think the small-medium companies are not represented and are not looked after. Their responses have shown that there are feelings of disconnection with the RICS. Most of them mentioned the cost of the membership or annual subscription fee as being the disadvantage of the chartered status that they have. They wanted more value for their annual membership, which they regard as higher

than the membership of other professions. Some of them thought that the RICS seemed more intent on making money out of its members. Most of its events are considerably expensive, including the CPD. Compared to the RIBA, one participant said:

> *...if you go to the RIBA CPD list, you will find a list that includes free CPD provider...* (***p8***)

This participant suggested that the RICS should make an effort to help its members, and, at the very least, guide them towards obtaining free CPD. Another participant commented on an issue with the body stating that:

> *They are not always the best organisation to work with [...] because it is so big if you got a problem, it's not always dealt with in the most timely manner.* (***p10***)

A third participant who currently sits on the RICS UK council said that the body could be a bit frustrating sometimes, especially with the bureaucracy within the institution. Another said that, since it is a big organisation, covering all categories of surveyors, perhaps it does not focus on the QSing profession enough.

4.3.2.5 Summary

In summary, FYSs were not very engaged with the RICS. The NPs' were more reliant on the body as they are all preparing for their APC process. The CQSs, on the other hand, were mostly engaged through CPD, which is part of the membership requirement. The study thus suggested that the body is viewed differently by different participants. It was found that the association with the professional body was not particularly strong and a number of the CQSs also indicated that they felt neglected by the institute. These findings are crucial to this study as they would establish the link (if there is any) between the RICS and participants' PI. This connection is discussed next.

4.4 Changes in Professional Identity Descriptions

This section discusses how the participants perceived their PI. Kogan (2000) asserted that the concept of PI is both individual and social. According to the author, an individual (i.e. a professional) will become stronger due to his or her acquired expertise, having their own moral and conceptual framework, and performing a range of significant roles. These attributes, however, are also strongly determined by the communities and professional institutions of which that individual is a member (Kogan 2000). Therefore, an individual's PI evolves when that person adopts attributes from within their profession through a process of socialisation (Beijaard et al., 2004). As discussed in Section 4.1, the construction of PI involves two forms of socialisation which are socialisation for work and socialisation by work. This professional socialisation process will impact on an individual's professional development as he or she progresses from being a student to a novice and progressing to a committed professional in the field (Cornelissen & Van Wyk, 2007). The outcome of such socialisation would ideally be identification with the profession that will consequently form the PI (Cohen, 1981).

Participants in this study were explicitly asked how they would describe their PI. When asked, the students and novices found it difficult to align themselves with the profession as they were not entirely sure of their PI. To help formulate the question, the researcher asked them to describe themselves as a QS practitioner, or a soon-to-be QS practitioner, or a professional. Since there have are many definitions of PI in the literature and as previously discussed in Section 3.3.2, the participants were not able to provide, with explanation, the definition of the PI concept. This was essential to inform the research and to allow them to give their descriptions of PI based on their notion of the concept. Table 4.5 illustrates the contents of the participants' descriptions of their PI that have been categorised based on the characteristics identified.

Table 4.5 Professional identity descriptions by the participants

Characteristics	*fy*	*np*	*p*
Profession related roles	***fy6***– construction accountant; towards money side & manage costs ***fy7***– cost management ***fy8***– cost management & dealing with contract ***fy9***– someone controlling the cost ***fy10***– accountant for building, can work in law, involve in dispute resolution	***np2***– look after client's interest; budget, measuring, costing, get latest rates ***np3***– assistant cost manager; assisting whatever I can ***np4***– client's professional QS; their representative, a person between project & business ***np5***– graduate surveyor; could do the job but not as well as other surveyors yet ***np7***– deal with numbers & a lot of people, we understand building in a whole (more) compared to designers ***np8***– research behind all the cost that's given, network with other people to ensure that getting correct figures ***np9***– despite commercial team I speak after profitability of the company & project, contract administration, main priority to minimise risk & cost of project ***np10***– helping out with cost plan, estimates, site valuations, procurement & tendering	***p1***– offer independent views, help with dispute ***p2***– provides both financial & contractual advice, ranges from financial planners, financial managers & contractual contract services advisor ***p3***– professional man provided professional service, to tell client the truth ***p4***– professional CQS with qualification & making reliable contribution to the work that I do ***p5***– what would you define the difference between my role & my identity? To deliver financial certainty & control ***p6***– split between traditional QSing & other roles ***p7***– a QS ***p8***– role in procurement is probably the most important in what we do ***p9***– benchmark of cost data &provide information for the whole project ***p10***– a trained QS & do the pure QS role, contract administrator
Attributes	***fy2***– having QS knowledge ***fy3***– with bit more experience ***fy4***– QS student ***fy5***– still a student ***fy6***– QS knowledge that have picked up over the years	***np1***– keen to learn & involve to get experience & build up more knowledge, preparing for APC ***np3***– trust, vigil, done module on professional ethics; client stuff ***np5***– work hard, lack technical understanding, funny ***np6***– no specialised area yet, human characteristics; details, enjoy working with numbers, ability to talk to people, problem solver in terms of money ***np8***– qualities; hardworking, determine ***np10***– I may offer a high level of service that will bring value to the project	***p1***– outstanding member of the community, a listener, independent ***p3***– user friendly, honest ***p9***– behave in a collaborative way that respects other members of the team, trustworthy, honest, fair, reasonable, can relate to people, respect others, accurate ***p10***– jack of all trades
CQS or RICS members		***np10***– I've attended the RICS event, code of conduct	***p4***– a CQS ***p6***– a CQS ***p7***– a member of the RICS
'our' or 'we' (collective identity)		***np6***– we all quite good people, we are problem solvers in terms of money ***np7***– we deal with numbers, we understand more than	***p1***– we listen to people's concern & offer value judgement ***p2***– our PI is QS should be perceived as professional who provides... ***p8***– we do awful lot more

		designers, QSs do not get enough acknowledgement	***p9***– we can provide information for the whole project
Other roles			***p3***– a businessman ***p6***– delivering project management, programme management as employer's agent, managing business ***p9***– sometimes act as a project manager ***p10***– a project manager, jack of all trades
Other name or term			***p2***– being term in the past as technical accountant, boring profession & that has been a bit of an issue ***p8***– being called beam or brick or counter, title not accurately representing – re-title ***p9***– perceived as brick counter, see us as count building materials, not aware of what we do

From Table 4.5, it is observed how the descriptions evolve from just profession-related roles and personal or professional attributes to various definitions. These are discussed further in the next subsections.

4.4.1 The Final Year Students

Half of the FYSs (five FYSs) associated PI with their future profession, even though they find it difficult to describe their PIs and were not even sure what PI was supposed to encompass (discussed in Section 4.2.2.2). Whereas, the other four FYSs were able to describe their PI attributes; two FYSs said that they were still students, one associates it with having knowledge and awareness about QSing, and the other associated it with having a bit of experience of practising as a QS. Among the FYSs, only one specifically said he/she did not have an associated identity yet. However, they could already see themselves as soon-to-be QS professionals in the future, and most of them said that they were going to start preparing for the APC as soon as they started working. The students might not have realised it yet but preparing for the APC can be considered as one of the indications that they have associated themselves to their profession, thus developing an emerging identity as a QS. They are more focused on

their learning and were only exposed to work experience through the placement that only lasted for just a few months (see Table 4.3 of Section 4.2.2.2.4). Since they were still doubtful whether they have optimal preparation for professional work, they were uncertain about having a PI as soon-to-be QS professionals.

4.4.2 The Novice Practitioners

The NPs also found it hard to describe their PI, so the researcher asked them to describe themselves as a QS practitioner instead. Eight of them could relate their current role and work to their identity, and the other two (***np1*** and ***np6***) described their attributes, as shown in Table 4.5 above. Participant ***np1*** said that when you are still new, the primary focus would be preparing for the APC. Thus, one is very keen to be as involved as possible with the work to gain more experience and knowledge. Participant ***np6***, in particular, described PI as:

> *I would say as human characteristic, I think I have a detail […] I like find pleasure in finding something that might have been missed or almost getting missed by someone else [...] I enjoyed working with numbers now more than before […] we all quite good people. People, people because obviously a lot of clients especially what we do here and design team interactions you always talking to people […] the abilities to talk to people, be friendly enough and I don't think someone who's not good at that would do so well […] the role really encourages that […] I'd say everyone in this office QS obviously a good problem solvers you have to think outside the box sometimes to answer question the client might ask with situation...* (***np6***)

How this participant described P1 is aligned with what Edwards (2014) saw as the definition of PI. The author said that PI is defined "through individual' descriptions of relevant professional attributes and characteristics" Edwards (2014: p.40). Those attributes and features are essential in QSing profession as stated by this CQS:

…our profession is two things, having a personality and having a technical understanding… (***p3***)

The other CQS also said something similar to participant ***p3***'s view, which is, P1 is associated with having personal skills as well as technical skills. It is also apparent from the description that Participant ***np6*** acquired the attributes and characteristic through interactions with his/her colleagues. The term 'our' and 'we' that were used in the description (including participant ***np7*** and four CQSs shown in Table 4.5) affirmed that the identity is both individual and social (Kogan, 2000).

4.4.3 The Chartered Quantity Surveyors

The CQSs, even though they were more confident when describing their own PI, responded:

Gosh. That's a difficult question. (***p4***)

It is quite hard isn't it? How to describe it? (***p1***)

I did think to myself, I thought well, you got different question… (***p9***)

Schein (1978) described PI as encompassing attributes, beliefs, values, motives, and experiences that help individuals define themselves in a professional role. In this study, 'role' was a strong concept used by all of the CQSs and eight NPs who linked it with their role when describing their PI, as quoted:

How do you describe that differently from my role? What would you define the difference between my role and my identity? I'm very clear on that (my role). In a nutshell, it is to deliver financial certainty and financial control within the construction. (***p5***)

Our professional identity is QSs should be perceived of what it always is should perceive by the rest of the industry and is professional who provides both financial and contractual advice throughout the whole construction process both pre-contract, installation process and the life-cycle estate management phase. (***p2***)

The word 'our' that Participant ***p2*** used can be perceived as referring to the collective professional QSs, as mentioned earlier. However, there were not many CQSs linking their PI with their professional body, i.e. the RICS and the chartered status that they have. Among the ten CQSs, only three did, as illustrated below:

Well, I set myself as a professional chartered QS, with the qualification. (***p4***)

I'm a chartered QS by background but I spent some of my time split between traditional QSing, project management… (***p6***)

I'm pretty clear that I am a quantity surveyor and I am a member of the RICS. (***p7***)

It was also evident from Table 4.5 that attributes and values were also used as part of the participant's PI as illustrated below:

I like to think I'm user friendly, but I will be honest. My job is to tell the truth. I'm not here to disseminate information for a client or to a client because it suits that client. My job is very clear that I need to tell the truth because if I don't he can get suffered and I can get sued. (***p3***)

I behave in a collaborative way that respects other members of the teams' roles and duties […] Trustworthy, honest, fair, reasonable, can relate to people, can respect other people's roles and give them their autonomy… (***p9***)

With the value aspect as well, Participant ***p1*** differentiated him/herself as not just being a person but also being part of the organisation that people could place greater reliance on:

> *I think it is sort of, an outstanding member of the community. Somebody you could discuss your issues with if you have concern about a project or something. A listener, we listen to what people's concerns are and would offer a value judgement. Independents; I think that's a very strong thing; independent, as in private practice particularly, offer independent view on things, help if somebody got, maybe, dispute going on, to find an ear to turn to. So, that independent, I think for private practice particularly is very important.* (***p1***)

Participant ***p10*** distinguished his/herself with the other QSs by stating that:

> *I think I'm quite different to other QSs. Although I'm a trained QS and could do the pure QS role but I'm also project manager, contract administrator and I do all those sorts of roles as well. So I'm not someone that just at the desk all day being a QS […] I'm a jack of all trades I would say is my role […] But I could step into a job as a pure QS, but I think I'll get bored if I just did that. I like the variety.* (***p10***)

This description (***p10***) was aligned with Edward's assertion that PI is also determined by how one differentiates one's own identity from that of others (Edwards, 2014). The description identified a transformation of self as it arises through engagement and negotiation with their work. Billett and Pavlova (2005) see this transformation as an intertwined relationship where the individuals' perception of their work and how they identify with it, is dependent on the extent to which their work permits them to 'be themselves' and to exercise their sense of self (as illustrated by Participant ***p10*** description above). The other three participants (***p3***, ***p6*** and ***p9***) noticed the transformation of self as they took on different roles from just being QS. One of them mentioned:

I'm a chartered QS by a background and I think that is what I would say and I've moved into delivering project management and I've also in that specific of time delivering programme management as employer's agent role so project management obviously is not QSing there are elements that overlap clearly within the kind of services, skill set and the responsibilities but it's been slightly more vary from that [...] and also which is linked but slightly separate managing the business itself. (***p6***)

These four CQSs (***p3***, ***p6***, ***p9*** and ***p10***) illustrated that apart from an identity as a QS, they also have other identities that they undertook as well apart from their core QS role. In addition, according to CQSs ***p2***, ***p8*** and ***p9***, their identities contained elements of perception about the roles of others as illustrated in Table 4.5. It was essentially how others misunderstood or have inaccurate assumptions about the role of a QS.

4.4.4 Summary

As PI is how an individual defines oneself in relation to a profession (individually and socially), both NPs and CQSs are consistently linking their role and profession's traits and characteristics, as well as their personality and personal attributes with their professional self. There seemed to be other identities that exist in most of the CQSs as they described their other positions and roles as part of who they are. However, a professional body is not quite part of individual identity. With reference to Table 4.5, it appears that only four practitioners (one novice and three CQSs) associate their PI with the RICS. This finding aligned with the result from Section 4.3.2 where there was a weak connection with the body and this is probably why the institution was not stated in most of the participants' PI description. The research also identified a lack of essential elements of professionalism, particularly in the belief in public service. This aligned with the findings of Chan et al. (2007). How would this outcome reflect their conception of sustainability? This question is addressed in the next chapter. In summary, PI core values,

developed before formal professional education (discussed in Section 4.2), appeared to intensify during the educational process and continue to develop when engaged in professional work.

4.5 The Factors that Influenced the Formation and Development of Professional Identity

In the previous discussion, it was apparent that the emergence of PI had started even before an individual pursues his or her formal professional education. The concept continued to develop during the educational stage and progressed when the individual started working and developing his or her career. Along this journey, some factors influenced the formation and development of PI (as illustrated in Appendix F). Discussions on these factors would be divided into two sections, one is concerned with formal professional education, and the other one is during the working stage.

4.5.1 Formal Professional Education

Many factors contributed to the formation and development of PI during socialisation for work, i.e. the formal professional education stage. Some of these factors have already been extensively discussed in Section 4.2.2. Thus, the current discussion would be relatively brief.

4.5.1.1 Placement or Internship

This period is the time where the students felt increasingly connected to the profession. The experience provided them with ideas of what to expect at work, i.e. the workplace culture and environment, the knowledge needed and that they can also learn different tasks that might not be covered in their education. The students were able to practice knowledge and skills that they gained during their study, hence confirming that what they learnt is relevant to their work and

their future career. During this time, they also learnt directly from the QS professionals, making allowing them to have the experience of what being a QS entails. To Participant ***fy2***, these professionals were encouraging when they showed how passionate they were about their role and work. For Participant ***fy5***, work experience was believed to be the quickest way to learn. Based on the FYSs' responses, placement or internship is one of the factors that could reinforce their views about the profession and their future career direction.

4.5.1.2 Quantity Surveying Specific Modules

In relation to the FYSs and NPs responses, QS-specific modules provided them with a sense of connection to the profession as illustrated by some of their statements:

> *…quantification and costing that made me realise I'm capable and good at…* (***fy2***)

> *…quantification module […] I feel like it's complicated […] once I achieved it […] it's actually not that hard and it's part of my work in the future and also construction contract law module […] I feel really good when I studied that […] this is what I will be dealing in the future […] I feel like this is what I am, a QS…* (***fy4***)

> *…when I learning about contract management or some statutory law I feel like I'm more involved with the role of being a QS…* (***fy8***)

> *…QSing relevant modules are more I enjoyed over, and that was kind of tipping point made me consider (switching to QS programme)…* (***np6***)

> *…procurement and tendering […] an inspiration I did that in second year and I chose the same thing as well in final year construction module as well and yeah that was basically the turning point for me because it was something I actually enjoyed […] having to look why would this be more efficient […] understanding those efficiency…* (***np7***)

Quantification and costing are one of the QS core modules where students learn how to quantify building materials that are going to be used in a construction project and afterwards calculating the cost of those materials complete with their relevant or associated works. It is one of the primary and traditional roles of QS. Construction contract law, and construction procurement, on the other hand, are also part of the primary role of QS even though these two are optional courses. Therefore, it is critical that these modules are designed in such a way so that the students can fully comprehend the subject matter to enable them to understand and make direct connections with their future roles. They can then apply what they have learnt in these modules to fulfil their future role as QS as illustrated below:

> *I'm capable and good at...* (***fy2***)
>
> *I feel like this is what I am, a QS...* (***fy4***)
>
> *I'm more involved with the role of being a QS...* (***fy8***)

These three statements show how these modules made the participants feel strongly connected to the profession. Hence, they are able to relate to the profession.

To several participants, the QS-related module allows them to discover their potential, interests, and which traits fit better with their future QSing profession. This might differ from their initial intention, causing them to switch to the QS programme. An opposite scenario might happen as well, where students enrolled in the QS programme later decide that their interest is drawn more towards another direction. This choice made by the participants based on the discovery of their interests showed that education provides awareness to students that may shape their thinking about their future endeavours.

4.5.1.3 Projects Modules

As described by Participant ***fy4***, by going through a project module, even though they did not have a defined QS role, what differentiates the QS students from those studying other programmes is that they are always cost-conscious:

> *I think we are more cost-conscious...* (***fy4***)

> *...what I found is that when we are in a project, the QS tends to line more towards the cost part. That's what I did realise. I think it's the way we think our priority in the project.* (***fy5***)

These two statements indicated that the project reinforced the QS values or qualities that they may already have in them. Whether these students realised it or not, the characteristics of a good Qs was already ingrained in them. The module had been one of the selling points during job interviews for three of the FYSs (***fy3***, ***fy4***, and ***fy5***). It taught them how to work in a group environment (***fy2*** and ***fy5***), leadership skills (***fy4*** and ***fy5***) as well as overcoming diversity (***fy3***), skills that are fundamental in the working world.

4.5.1.4 Motivation

<u>The profession</u>

Two participants (***fy6*** and ***np1***) had work experiences in a QS firm before they pursued their professional education. Both of them enjoyed the experience such that it contributed to their decision to become a QS and enrol in the QS degree programme. Participant ***fy1***, on the other hand, said that:

> *QS is a good way of making a living...* (***fy1***)

Two others also stated something similar (***fy3*** and ***np2***) and noted that QS is a job that pays well. Apart from that, Student ***fy8*** was attracted by the reputation of the profession.

Qualification

Participant ***fy10*** had been working as a QS in a QS firm for three years and has a diploma-level education. In order to apply for a chartership status, Participant ***fy10*** needs to have at least a degree qualification, motivating him/her to enrol in a QS degree programme. For the two other participants, they claimed that:

> *It's always been a goal when I start at university…* (***np9***)

> *…the whole reason I went to Reading was because it accredited by the RICS so my whole goal was to eventually become chartered once I started working…* (***np10***)

Based on these quotations, getting a chartership status is a big motivator for them to learn about and to work in this profession. All the NPs' participants have been preparing for their APC the moment they started working. Having a professional qualifying status would be the first stepping stone in developing their career, and this is discussed extensively in Section 4.5.2.2.

4.5.2 Working Stage

This stage is where individuals gain experience and at the same time, continue with his or her learning process in relation to work. As for the graduates, this is where they may fill the gap between theory and practice.

4.5.2.1 Peers and Colleagues

The graduates or NPs, when they are still new and probably lack experience, they tended to rely more on their colleagues or a person in charge of them (e.g. line manager, supervisor) for help when they initially start their career. P6 claimed that:

> *When you are new to the industry, you are shaped by your peers…* (***p6***)

The people around them will eventually shape the newcomers' work ethics, values and practices as specified by this participant saying that:

> *...the first 19 years of work closely with a fellow of the RICS and he drilled into me the accuracy side and professionalism...* (***p9***)

During the transitional time from theory to practice, the NPs will observe people around them and try to learn as much as possible to enhance their social processes. Their development is linked to their access to both professional and social networks. During their day-to-day practices, they would realise that what they had learnt in university helps with the job, and it is the quickest way to learn and to get the pictures and insights about the profession and the professionals. Two of them (***np1*** and ***np5***) said that when working, they are directly involved and have an essential role in a construction project, making them feel that they are making valuable contributions to the project as well as to the company. Individuals' developmental relationships and involvement with essential works enhanced the clarity of their PI.

4.5.2.2 Preparing for Professional Qualification

The current engagement of novices with the professional body (the RICS) is through their APC preparation, as discussed in Section 4.3. They have to make sure that they fulfil all the requirements needed to be eligible and obtain the qualification. The RICS will provide information and guidelines that applicants need in order to apply. Some companies provide novices with a mentor or facilitator to help them with this preparation. To meet this goal, they have to engage in their role and work extensively so they can develop their competencies. This stage is where they should focus on their career because obtaining the professional qualification would significantly increase their stand and open up more avenues for them in the future, as shown in Table 4.6. With reference to Table 4.6, it is evident that the advantages of having a professional qualification will provide the novices with the recognition for their achievement and such recognition will subsequently lead to career progression. Four NPs specifically stated that a chartership status is part of their goal, as illustrated in Table 4.6 below.

With reference to Table 4.6, five NPs perceived that the chartership status would mean that they would become more competent and knowledgeable in this field, thus providing greater credibility for their work. The status also infers that they are professionals (***np4***) and at the same time, it promotes professionalism (***np9***) as illustrated below:

> *...know how to take responsibility, how to behave in front of client and just be able to basically an example to follow.* (***np9***)

Four of the CQSs feel that they were progressing towards becoming professionals, especially towards the end, as they forge ahead through the qualification process. One CQS noted that for chartered surveyors:

...by the time they passed the APC […] they should have a very good perception of what their status ship... (***p2***)

This statement illustrated that the APC process would heighten knowledge and skills that will consequently strengthen the participants' identification with the profession, and also their PI.

Table 4.6 NPs' perceptions on the chartered status

ADVANTAGES	PARTICIPANTS' PERCEPTIONS	
Recognition	***np1-***	Having those four letters after your name; hard work developing yourself as a QS.
	np2-	More flexibility in moving around companies.
	np3-	Specialise worldwide, internationally recognised.
	np4-	Recognition; really hard work, being a woman; as good as everyone else, we sell our services on being chartered.
	np5-	Respected by quite a lot of people, a lot more demands, like to work internationally.
	np7-	Recognition: shows that I actually know what I'm doing.
	np8-	Everyone will know that I'm competent, professional, can handle my own project, have good knowledge, can handle any situation, the name.
	np9-	Become part of the professional recognised body.
	np10-	To be recognise that you have reach certain level.
Career progression and achievement	***np1-***	Career progression, involve with more important projects.
	np2-	Opens the door internationally, promotion within work, opportunity to start own business.
	np3-	Ready & legally go to act on your own, leading to promotion & progress in career.
	np4-	Can ask for more money, progression to senior position.
	np5-	A pay bumps instantly, rise to the top.
	np6-	You can go higher.
	np10-	Can go work on your own, opens up avenue of work, network advantage.
Competence	***np1-***	Makes people more confident in your ability.
	np3-	Understanding that I know exactly what I'm doing, feel confident in my role.
	np6-	More knowledgeable, confidence milestones that I can handle myself.
	np9-	High quality members.
	np10-	You reached a certain standard.
Credibility or reliability or trustworthy or integrity	***np1-***	You work hard & know what you're talking about; gives you more credibility.
	np3-	Professional code of ethics; in making decision, hold accountable in a different way, should getting better in my job, learning more knowledge & becoming more competent.

	np6- ***np7-***	Moral stuff: can confidently say I know what I'm talking about, can be trusted. Credibility: shows that you are good & know what you are doing & not basing numbers on thin air or anything.
A goal	***np1-*** ***np2-*** ***np9-*** ***np10-***	Next big hurdle after grad. A massive tick in the box. A goal when I start university. A goal once started working.
Professional or ism	***np4-*** ***np9-***	Being really professional. Promotes professionalism & knowledge, shows that you are willing to put extra effort, time & miles, how to take responsibility, to behave, an example to follow.

4.5.2.3 After Qualification

After the QSs gained their chartership status, one CQS stated that after qualifying,

> *...you gradually inducing to the fact that there are people around you who would expect you to act in a professional way.* (***p3***)

Those people who expect them to act professional include superiors, colleagues and even clients. Having a professional qualification might mean that there would be less monitoring of the CQSs' work. Even though they might be monitored less, it does not mean that they are already competent, knowledge wise and skill wise. Therefore, they still need to keep up to date with the latest knowledge as it evolves, and one way of doing that is through CPD. This continuous learning is one of the direct links between the professional body and its members. It is the way the RICS make sure that the members are competent to practice.

4.6 Conclusion

This study revealed that PI starts to take form even before the students begin their formal professional education. One factor that contributes to this is the exposure to the profession, and its professionals is through work experience and a close connection with QS professionals. Another type of exposure that has a similar impact is through industrial placement or internship, especially to those who have not had any work experience before.

The following are additional conclusions summarised below:

- Learning provides students with better insight into the profession. As learning enhances their knowledge, professional education also makes them identify with the profession and their future career. Similarly, identification and commitment to a professional role are not fully achieved during this stage (Cornelissen and van Wyk, 2007). This was also reflected in the students' interpretation of the PI. This finding does not align with Jebril (2008), where the author identified that the construction of PI is at its highest during the learning stage.
- Being at work and practising on a daily basis strengthens the NPs' knowledge and skills. To them, every day is a learning process, and what could be a better way than learning from the professionals themselves? This engagement advances them to become more identical to those professionals, i.e. their mode of practice, behaviour and ethical dimension. Experience is vital in strengthening the PI.
- Even though the CQSs do not have a close relationship with their professional body, they have a definite conception towards their profession and their PI. However, the perception lacks the essential elements of a profession; in particular, the belief in public service.

PI is a continuous and evolving process and varies across individuals depending on circumstances (influenced by many factors) and contexts (education and practice or work experience), highlighting the dynamic nature of the concept. In addition, PI is not a familiar concept within the BE sector.

Chapter 5: The Emergence of Attitudes towards Sustainability

5.1 Introduction

This chapter is the second chapter that discusses the findings of this research. The section focuses on the collective experiences of all of the participants and explores and examines the emergence of attitudes towards sustainability from their experience. The research questions addressed in this chapter are:

i. *How can educational and practice experience play a part in the development of attitudes towards sustainability?*
ii. *How do current and future professionals perceive sustainability?*
iii. *What are the influencing factors in forming and developing attitudes towards sustainability?*

The analysis in this section is informed by the conceptual framework discussed in Section 3.3.3. As postulated in the framework, the emergence of attitudes towards sustainability is parallel to the exposure to the concept of sustainability during childhood, at school, university and the working world. The exposure can be in many forms with differing impacts.

The discussion of the findings is distributed into four parts, the first and second discuss the emergence of attitudes towards sustainability through the lens of learning (professional education) and practice. The third section examines changes in the perceptions about the role and responsibility of quantity surveying (QSing) professionals from the final year students (FYSs), novice practitioners (NPs) to the chartered quantity surveyors (CQSs). The fourth section explores the influencing factors that contribute to or strengthen the formation and development of attitudes towards sustainability among the participants.

5.2 Sustainability in Formal Professional Education

The purpose of this section is to provide an insight into the forms and outcomes (perceptions) of sustainability exposure before and during formal professional education.

5.2.1 Sustainability in Formal Professional Education

When the new students were asked if they had learnt anything about sustainability during their pre-university school time, most of them said that they were introduced to the concept and terminology (in other words they essentially learnt very little). Most of those questions alluded to the fact that sustainability is being incorporated into subjects like geography, biology, and physics, to name a few. From the new students' responses, it can be assumed that the incorporation and exposure were minimal. Three of them mentioned recycling bins that they have around the school, linking them to sustainability and the importance of raising awareness about recycled materials and foods. One of them, however, can barely remember what sustainability was about or what had been learnt by admitting that:

> *I knew that they should do things like that in school but nothing to stick in my mind obviously.* (***ns3***)

Nevertheless, among the ten participants, one seemed to be enthusiastic about it by stating that:

> *...I always been really interested in sustainability in geography that I've done. It is one of my favourite topics, so I was hoping to go and perform all this.* (***ns1***)

Participant ***ns1*** did not go down the geography route as there was an impression that it could be difficult to practise sustainability. Therefore, while looking for other options, a family member recommended the QS profession. The participant did some research into the profession as well as talking to some QS graduates and practitioners and came to this conclusion:

I looked into, and I enjoyed the look of it, I enjoyed working with maths and figures and analysis and stuff so it might suit where I wanna go. (***ns1***)

Furthermore, apart from an interest in mathematics that is fundamental to the QS profession, Participant ***ns1*** was also drawn to the other benefits of the profession. Some of these are money motivated and a better opportunity to make a difference through the profession specifically in terms of sustainability by stating that "the main point is to try sustainability really" (***ns1***).

Responses from the new students indicated that they had an insufficient amount of knowledge and awareness about sustainability (for instance Participant ***ns3***) when they joined the degree programme, having had little exposure to the concept except for one student (Participant ***ns1***). Findings from this category of participants indicated that exposure to concepts and principles of sustainability had provided students with some awareness of the subject. However, the level of awareness and interest depended on the extent of engagement, personal preference and an individual's value system (Horlings, 2015).

With this understanding, Section 5.2.2 investigates if formal professional education's approach to sustainability can provide students with more knowledge and awareness of the subject.

5.2.2 Final year students and novice practitioners (when they were students)

As discussed in Section 3.5.3, new students, final year students (FYSs) and graduates or novice practitioners (NPs) were doing or completed their degrees at the University of Reading. The university has been noted to have been at the forefront of research into sustainability and the environment for many decades (University of Reading, 2017c). Part of the aspiration of the School of the Built Environment within the University of Reading is to produce graduates who "could have a key role in major building projects, make an important contribution to addressing the global environmental challenge, or improve the competitiveness of the industry"

(University of Reading, 2017b). This aligns with the strategy of the University as a whole. From the statement, it is clear that environmental aspects are part of the attributes that the School aims to provide to its graduates. Although the students and or graduates would have had a similar exposure from one university; it does not necessarily imply that they would have the same outcomes. Hence, the purpose is to explore if the students and graduates who were exposed to sustainability changed their perceptions about the concept after completing their professional educational programme.

Five FYSs and four graduates said that they had one compulsory sustainability module that they had to take in their final year. Five others (two FYSs and three graduates) said that they took a green innovation module, which is also a sustainability-specific module. However, one participant said this:

> *I haven't learnt about, because I didn't take the sustainability module, so I don't know much about it really. I don't think I've had and yeah actually I think in the first year probably, but I don't remember it as much.* (***fy2***)

Regardless of this comment, the details of modules in the School demonstrate that the theme of sustainability runs throughout the programme (see Appendix E) regardless of the choices made in the third year; it is clearly illustrated from the School's website (University of Reading, 2017b) that sustainability is one of the core modules from the QS degree programme. Therefore, this implies that Participant ***fy2*** may not be engaging with the programme or modules as would be expected.

The other reason was perhaps the students provided a different interpretation of the sustainability themes as illustrated below:

> *Some of the modules are dedicated to sustainability but it was more biology. I'm really ashamed of myself that I have to memorise some of those things…* (***fy1***)

The type of content is probably the reason some students were unable to relate sustainability to what they have been studying and their future profession. Apart from the core sustainability module, the concept is integrated into the other modules like projects (three students and two graduates), and information and communication (one student: using computer software for passive design). One FYS mentioned that, in the project module, what they did was not explicitly related to QS:

> *…for each project we had to sort of research some sustainability solution regarding that type of design that we did but not specifically for QS so if you ask me how these would be applies how about QS specifically, no.* (***fy1***)

However, the other two FYSs claimed otherwise, as illustrated below:

> *…project module as well, they always ask us to think about what else is the sustainable way that you can do to make your project better, save the cost…* (***fy4***)

> *For project QS we have to design building so even though you're a QS you have to consider the design, the cost but you also have to take into account of the sustainable consideration…* (***fy5***)

It was apparent that quotations from Participants ***fy4*** and ***fy5*** contradicted the claims made by Participant ***fy1***, yet they were attending the same class. These outcomes further reinforced the fact that different students have different interpretations and levels of engagement with their programme or modules. Referring back to the statements made by Participants ***fy4*** and ***fy5***

above, they mentioned the cost as part of the consideration regarding their project and that cost-related matters are apparently part of the QS role. The university website shows two project modules; one is called 'Projects' that has to be taken in the second year; the other is a third-year 'Project QS' module, which is obviously QS-specific. Thus, their responses would have covered both modules. The projects module in the second year is taken by students from the other programmes (building surveying, construction management and surveying, and construction management). Therefore, the project module suggests a multidisciplinary approach within higher education, similar to what Hartenberger et al. (2013) requested for the professions. In their research into a shared PI across a range of BE professions, they concluded that the professions are still struggling to integrate issues of sustainability. This finding suggests that the University played a role in incorporating those issues through shared learning among students from different programmes.

When asked about the involvement of Participant ***fy1*** with sustainability during their placement experience, the participant said there was no involvement. Thus, when asked about the importance of sustainability, the response was:

> *It makes it more expensive. It's good for the whole planet but not specifically for the construction…* (***fy1***)

Furthermore, during the interview, Participant ***fy1*** added this remark:

> *This industry is also full of people just looking for money. You think of sustainability, I think I'm thinking of people who pay for such building do they get really as equal as they paid I mean value for the money.* (***fy1***)

As cost is a primary QS role, it is understandable that the students' (six FYSs) placed more emphasis on it. This meant that these students had already associated themselves with their profession (as previously discussed in Chapter 4). However, in linking sustainability with the QS-related area, another student replicated what was mentioned by Participant ***fy1*** but with a different take on the individual aspects emphasising that the two were not incorporated. Even though Participant ***fy3*** did not explicitly mention about any specific module, this is what the quotation inferred:

> *…we talk about sustainability and costing in two separate things but I think they should be really be integrated so that you could understand how to make a cost saving while also introducing sustainable features and realise the cost aspect of it.* (***fy3***)

The programme clearly engages with sustainability (where the theme runs through the programme) but probably it is not obvious to the students how it is embedded. This approach can make students realise the importance of sustainability as the fundamental direction for the BE sector (Hartenberger et al., 2013). The outcomes that were identified from the findings might also be about the level of engagement either by the academics or by the individual students themselves. This was evident from the responses and discussions above (i.e. in this section) and the statement made by Participant 6:

> *When I was at uni, sustainability, I'm not saying it's a big thing, but sustainability was stress so much more at uni […] because of the exposure that I had when you came out of uni, you almost expected that every project would have, we gonna have [...] sustainable energy methods […] when really that's not as common as it made out in some of the sustainability module at uni. I don't know if that is the way that they are trying to teach you more about the options of sustainability so when you ever come across it, it makes sense. Yeah that was what surprise me […] it's not common place I thought it'd be.* (***np6***)

This statement inferred that the amount level of exposure can be considered to have a positive as well as a negative contribution. On the positive aspect, students are well prepared in terms of their knowledge and awareness of sustainability as Participant ***fy4*** said:

> *I was grateful that I learnt this (sustainability) in the uni so I can answer like I have this concept in the uni so I can answer those questions.* (***fy4***)

This statement explained that during a work interview, one of the questions that were asked was about sustainability. Participant ***fy7*** explained that sustainability is one of the key interview points and interviewees needed to have an awareness of sustainable construction. According to Murray and Cotgrave (2007), construction firms are placing high hopes on HE to provide sustainability-literate construction professionals. The statement from these two students must have shown that some firms do look for graduates with sustainability knowledge and awareness.

5.2.3 Summary

During professional education, the students engaged with sustainability as it is integrated across a number of modules throughout the programme rather than being a single module. As asserted earlier, the outcome of learning might be different between individual students; this is evident from their responses. It was clear that a couple of participants (***fy1*** and ***fy2***) did not engage enough with their learning, especially in relation to sustainability. This consequently impacted their understanding of the concept resulting in them having both limited knowledge as well as some understanding about it. In addition to this, Participant ***fy1*** did not have a good impression, not just about sustainability but also of the programme as a whole. Nonetheless, the majority of the participants (FYSs and graduates) said that they had one sustainability-specific module. Three participants (one student and two graduates) said that they learned a lot about sustainability from the university. The majority of them also associated sustainability with cost-

related matters indicating that they identified and were able to link what they are learning with their future career as a QS where cost plays a fundamental role.

However, are they better prepared with a sense of responsibility for the world they will inherit as a global citizen? Can they become the agents of change? The high hopes that they will be able to make a difference might get crushed by the industry (or the practice), which might modify their perception towards sustainability, e.g. from very important to a not so practical for the construction industry. The other thing is what will be the consequences when they embark into the world of practice with the perception that sustainability is expensive, for instance? From the QS practitioners' perspective, this might lead them to not consider the sustainability options at all. In summary, the programme's sustainability engagement had a positive but varying impacts on students. The next section explores the engagement of sustainability in practice and the workplace.

5.3 Work Engagement with Sustainability

This section explores the participants' (NPs and CQSs) sustainability exposure and experience during their work practice and how this might have shaped their perceptions towards sustainability. Even though the discussions of these two categories of participants are separated according to their respective sections, there are certain aspects that will be a combination of both categories.

5.3.1 Novice practitioners (NPs)

In the context of this research, in a known workplace, the question remains whether sustainability has been part of the NPs' work. Their responses are shown in Table 5.1:

Table 5.1 Novice practitioners' involvement with sustainability

Involvement with sustainability	Participants
Yes	***np4***, ***np5***, ***np6***, ***np7***, ***np8*** and ***np10***
No	***np1***, ***np2***, ***np3*** and ***np9***

From Table 5.1, six NPs said yes to the involvement with sustainability in the workplace, and the other four said no. However, among the six, only two were directly involved with elements of sustainability in the project: BEEAM implementation (***np6***) and sustainable construction methods (***np8***). The other four were involved through the company's sustainability programme or agenda. The summary of their detailed responses in terms of their work involvement with sustainability are illustrated in Table 5.2.

One of the NPs who had no involvement with sustainability in the workplace explained that it was mainly due to the company's business area as illustrated below:

> *The reason for that is because I work in a rail industry and we don't really look into this sustainability because what we do is, we replace cables. There's not a lot of design work involved. We replacing a signals […] introduce solar panel or something like that. It's just the nature of the industry. Sustainability is such a minor element […] what we are doing in terms of waste management is how we segregate the materials how we disposed them…* (***np9***)

Even though Participant ***np9*** mentioned the rail industry, it is more to do with the nature of the company's business. Even though there had been many studies that aim to achieve a better environmental position in transportation (Lee et al., 2008), most of those studies focused on rail

vehicles (Dewulf et al., 2004) rather than the overall infrastructure. This is because of the relatively high energy consumption of rail vehicles. The company that Participant ***np9*** was working with involved rail infrastructure, including the construction and maintenance of railway facilities. That is probably why sustainability measures within the company's business, according to the participant, are not that substantial.

Table 5.2 Summary of novice practitioners' work involvement with sustainability

Work Involvement	NPs' Responses
np1	▪ Have not had a chance to be involved yet. ▪ There are a lot of projects where there is a big focus on sustainability.
np2	▪ Not worked in anything specifically. ▪ The company is quite a big sustainability programme. ▪ Client always want sustainable buildings now so we'll always work to that.
np3	▪ Have not done any yet.
np4	▪ We try I think it is silver we aim for in all our buildings that we work on. ▪ We don't necessarily always get a certificate at the end because of the cost involves. ▪ I sometimes question the thinking behind it or why clients are asking for it, whether it just because they can say we're lead silver.
np5	▪ Part of sustainability committee; mostly office related. ▪ Economic sustainability; selection of suppliers who are good with regards to their sustainability. ▪ Social sustainability; modern slavery.
np6	▪ All projects I worked on quite hard on BREEAM; achieving excellent or aiming to. ▪ We got some green walls in some projects which is sustainable method. ▪ I haven't had too much exposure to it yet.
np7	▪ There's been a big push on sustainability; looking for different ways of how they could make building more sustainable and efficiency in general; most of it are public sector projects. ▪ In terms of big project we're working on very much push from the client.
np8	▪ We have used a sustainability method.
np9	▪ Not really. ▪ I work in rail industry where we don't really look into sustainability. ▪ It is the nature of the industry that sustainability is such a minor element. ▪ What we do is in terms of waste management; how we segregate and disposed the materials.
np10	▪ Sustainability is the higher spectrum; most of our jobs point to route to BREEAM rating. ▪ We try to be as environmentally standard as we can. ▪ Through whole life costing.

For the three other participants who said no to the involvement of sustainability, it is more to do with being relatively new to the company and therefore lack of opportunity. Even though they had not been exposed yet to sustainability issues, they explained that a lot of the company's projects involve sustainability, which is a key part of the company's policy. These participants had been working for less than a year. However, there was one newcomer (Participant ***np8***) who had been working for less than a year but had already been involved in a project that is using sustainable methods. However, ***np8*** was unable to elaborate further due to a nondisclosure agreement.

On the other hand, more senior participants (three participants) who have already been at work for more than a year, specifically mentioned sustainability assessment methods as being the most used in projects that relate to sustainability. Two of them illustrated that as follows:

> *All our projects I worked on quite hard on BREEAM so obviously there's sustainability […] BREEAM is key on all of my projects but other than that we got some green walls in some project which is sustainable methods. I haven't had too much exposure to it yet maybe over time, five to ten years be able to see a lot more sustainable stuff happen […] not too much exposure to it yet not saying that it's not there. The ideas are all there.* (**np6**)

> *Sustainability is the higher spectrum of the work. Most of our jobs point to route BREEAM rating […] low carbon rating but I also understand the fact that most materials are shipped from all over the world so it's kind of, I don't think you can never be, there's always, we try to be as environmentally standard as we can…* (***np10***)

From the two quotes, it is apparent that sustainability assessment methods (i.e. rating system or sustainability certification) is one of the factors that drive sustainability measures in a project. It is also apparent that, as the novices progressed in their career, they would have more exposure to and become more knowledgeable about sustainability. It is also worth noting in the content

from Participant ***np6***'s statement that highlighted the fact that sustainability will become a lot more important in five to ten years. From the statement, it can be inferred that the company's project-related sustainability involvement is still not as much as the participant expected it to be. This is probably due to the fact that since sustainability has been extensively explored their during degree programme, this participant, therefore, had high expectations in relation to the construction industry's sustainability adoption as quoted in Section 5.2.2.

Referring back to the two quotes on the rating systems, the participant's response seemed to imply something else as quoted below:

> *We try and I think its silver we aim for in all of our building that we work on and we aim for it. We don't necessarily, we always get a consultant in, we don't necessarily always get a certificate at the end because of the cost involved. It's more of a so we can say we've done it rather than that anyone really that interest in it I suppose but I think big corporate client will definitely heading towards that. I sometimes question the thinking behind it or why they are asking for it, whether it just because they can say we're lead silver so yeah.* (***np4***)

What does the statement mean? Are the projects adopting the sustainability assessment method (rating system) just to comply with the planning requirement? Or is it just to portray the right image of the company and the projects, or for the marketing purposes? Does this kind of exposure have any impact on the participant? In responding to another sustainability-related question, Participant ***np4*** said that:

> *...I don't feel like I get any say in it at the moment but when and if I did then I think that would be quite high on my agenda and I would like to work with client that which quite high on their agenda because I think some of the options out there are quite cool.* (***np4***)

From this statement, it seemed that the participant is quite keen to embrace and to get involved in sustainability. However, when one is new to a company and lack experience, one mostly just follow the instructions given.

Returning to the issues of building assessment methods, two CQSs said that those assessments are:

> *...a bit of pain in the neck really, but you have to build it in as the course of the job...* (***p1***)

> *...not all ideas works. I don't think BREEAM works particularly well actually...* (***p8***)

From the statements by ***np4***, ***p1*** and ***p8***, there is no issue with the assessment of buildings per se, but the experience of dealing with the assessment and fulfilling the requirements might affect motivation towards sustainability. Based on the quotation by Participant ***np4*** above, it suggested that people who are involved with the rating system was just anxious to be seen to be green. The issues surrounding BREEAM as highlighted by Schweber (2013) did not have an impact in shaping PI as none of the main actors t involved directly with the assessment process mentioned BREEAM performance in their presentation of self.

Generally, from this section, the responses from NPs demonstrated a grey boundary as to who has been exposed to measures relating to sustainability. Their responses mostly describe it in general terms rather than their specific and detailed involvement. Though there is some integration with responses from the CQSs in this section, this category of participant's responses would be discussed in detail and clearer in the next section.

5.3.2 Chartered quantity surveyors (CQSs)

The lack of clarity from the practices of the NPs prompted further investigation with the CQSs. Altogether, ten CQSs' were interviewed, and all but one were involved in the sustainability themes. A summary of their responses is shown in Table 5.3.

Table 5.3 Summary on work involvement with sustainability

Work Involvement	CQSs' Responses
p1	▪ Clients are asking for PV panels and air source heat pump. ▪ A lot of council are asking as part of planning commission. ▪ Sustainable homes and BREEAM: a pain in the neck but has to build it in as part of the job and for the right reason overall.
p2	▪ More department of the architect. ▪ Involvement in design process through value engineering. ▪ Keen to commit within mode of building passive house.
p3	▪ Driven by legislation. ▪ Driven by market. ▪ The job is to achieve the outcome in the most efficient.
p4	▪ Not directly. ▪ Demonstrate over a period of time to spend more that will last longer and less maintenance; that was part of sustainability.
p5	▪ Not specifically; we do work in terms of costing and helping designers for BREEAM and other codes. ▪ Spent a lot of time supporting them. ▪ Not something we would innovate. We rely on designers to be innovating. ▪ I don't think it's a lead profession in terms of sustainability.
p6	▪ Sometimes more or less with individual project. ▪ From individual professional, sustainability is part of our consideration. ▪ BREEAM rated project: driven by clients' brief and planning requirements. ▪ As an organisation: recycling, energy saving, cycle to work scheme. ▪ PV vs. CHP, thermal property, materials: costing against capital and operational cost.
p7	▪ Big ticket: ground source heat pumps, PV, solar water heating.
p8	▪ Part of every project I work on now and rightly so. ▪ One of the clients very keen on their buildings to be very green. Do a lot of research on different technologies. ▪ London code that need to comply certain standards. ▪ BREEAM do not work particularly well. Too complicated and too all-encompassing. It becomes a bit of a tick box exercise.
p9	▪ Whole costing: product, maintenance. ▪ Closely link to company called leisure energy: deal with efficiency and energy loses. ▪ Solar PV.

	▪ Taking consideration of the capital cost that is a big thing for client.
p10	▪ Sustainable home assessment. Certain codes were annoying. ▪ Putting it into building regulation is a good idea.

Surprisingly, one participant (***p4***) who had been practising for 56 years said that their work so far was not directly involved with sustainability. Participant ***p4*** added that the work involved was basically demonstrating to the client that it would be better to spend more on something that will last longer or does not require much maintenance now that costing them more later According to Participant ***p4,*** this type of work was part of sustainability as it included the cost imposed (operating cost or cost-in-used) over the years i.e. life cycle costs (LCC). The other three CQSs (***p5***, ***p6*** and ***p9***) also mentioned their involvement with the cost-related aspects of sustainability measures. Two of them (***p6*** and ***p9***) mentioned something similar to Participant ***p4*** where they did the whole costing of sustainable products including the cost of maintenance; costing against capital and as well as operational costs. In this regard, Participant ***p1*** asserted that sustainability and maintenance cost overlap with LCC. LCC is defined by Clift and Bourke (1998 in Bartlett and Howard, 2000: p.319) as "the systematic consideration of all relevant costs and revenues associated with the acquisition and ownership of an asset". Four CQSs (***p1***, ***p6***, ***p7*** and ***p9***) undertook LCC costing for some of the 'big ticket' items such as ground source heat pumps, photovoltaic (PV) panels, solar water heating, and air source heat pumps. Even though these systems can provide efficiency and energy saving, their capital cost can be quite high. Thus Participant ***p9*** insisted that:

> *Capital cost is a big thing for QS but I think that needs to be just remember that the capital cost is a big thing for clients as well.* (***p9***)

In this regard, QSs have to find ways of convincing their clients about the savings that they can make from the efficient running costs and, instead of wasting energy, they can conserve it in the first place. Therefore, according to Participant ***p6***, clients who are more sensible or financially able will consider the operational cost of those systems.

However, in considering the adoption of these sustainability measures, one participant said:

> *It has to make it work. As I said to you, it has to be credible. If you getting a return, look, if the client said "I want to do this" it's not my job to tell the client what he can't do. It's his money. He can spend his money how he wishes to but if you want to put PV on the north facing roof in the winter and expect the office to run on that, and it won't. It's my job to say "are you spending your money there the right way?* (***p3***)

This statement (***p3***) indicated that the implementation should fulfil two conditions; one is it has to work in the sense of function and objective (the return benefits). Second, if the client wants it. Technology has to work in order to be successfully, or fully, adopted (Allen et al. 2010). As the fundamental role of a QS is to provide the most cost-effective project for the client, they have to make sure that it is delivered. Therefore, if putting sustainability measures in a project might not meet that goal, then a QS might not even want to consider it. Other participants also believe that, if they have documents that prove the cost-benefit and other benefits of the sustainability measures within the project, it will help them to influence their client and other stakeholders. This participant also said:

> *I think what will be helpful for me is probably seeing more articles produce and is not so that they are not there at the moment, but that message to be clearly hit home by the RICS so that it makes it easier for me as an individual to influence my project team to say this is a good idea because […] I think that's the benefit from the RICS.* (***p6***)

By this statement, some scholars also argued the importance of having valuable information related to sustainability (Chong et al., 2009; Cushman et al., 2005). By providing this information, clients, buyers and the general economy at large would be able to understand and be aware of the benefits (enhances wellbeing, economic benefits, to name a few) of sustainability. Participant ***p6*** stressed the role of the professional body, the RICS in particular, in helping to provide and disseminate this type of information. This might also mean that the body has not done so or as much as expected. One other participant also stressed the difficulty of obtaining cost information from a certain industry stating:

> *…some industries, manufacturing industries where like lift and escalator specialist where you trying to get the cost information they also know you are QS you struggled to get. You try pretend to be a designer or a client and then you'll get they don't like to give it to QS somehow.* (***p8***)

The statement (***p8***) illustrated that, as QS deal with the cost of the project, how can they provide an approximation, or even accurate, estimation of the project's cost when they are unable to obtain some of the information? Cost and demand are interlinked as illustrated below:

> *…they saw it as a cost and clients weren't asking for it.* (***p1***)

> *I think historically, sustainable agenda cost money. If something was sustainable and cheaper than you would always, no client is going to say why wouldn't I do that.* (***p5***)

Many researchers have cited additional construction costs as the most widespread barrier to the implementation of sustainable construction (Hakkinen and Belloni, 2011; Williams and Dair, 2007). Therefore, since engaging with sustainability is equated to incurring extra money, most clients may opt for cheaper options. Thus, having a project with sustainability measures in it has not always been a good choice in terms of financial or investment aspects, despite the fact that it will be good to the natural environment. The demand for sustainable construction will

put pressure on cost consultancies because clients may demand not only historical data but also futuristic data (Matipa et al., 2009). As discussed earlier, having a particular document or cost information would help the QSs in giving advice and making suggestions regarding sustainability options.

One participant suggested what could be done to improve sustainability within the construction industry and what the RICS, as a professional governing institution, could do:

> *I could do it if I'm delivering a project that has a planning requirement because it is mandated into that project. I think that's something that the RICS could influence through other route for example, from the planning perspective[…] by demonstrating the financial benefit of projects by for example having PV on the roof and confirming payback period.* (***p6***)

From this statement (***p6***), it seemed crucial that the RICS should provide support to its members with regards to sustainability. It is quite difficult to convince other people when you do not have anything to support your advice and judgement as illustrated below:

> *…as a QS you shouldn't be necessarily specifying you suggest […] if you do suggest and it's wrong then you gonna get sued and you gonna be in trouble say that's why I think some QSs will probably just keep shut and just did their job really and not goes beyond what they are meant to be doing but I think there's definitely scope for suggestion when you are a QS and I think documents, certain documents produced by the RICS could incorporate sustainability a lot better.* (***p10***)

From the two quotes (***p6*** and ***p10***), it was apparent that the RICS, as a professional institution or body, who has authority over its distinct knowledge and expertise should provide its members proof and assurance or even guidance in promoting and encouraging sustainability in the construction industry. If the institution clearly projects the benefits of sustainability, then others (clients, stakeholders or members of the team or project) would have more confidence

in considering sustainability in their project. One participant said that the whole industry is so intertwined with different industries and companies who are all doing different things and driving towards different goals so:

> *…you never gonna have collective strategies on sustainability unless it is a government-led thing…* (***p10***)

As discussed in Section 2.2.4, the industry is so fragmented that the people involved in it only cooperate and work together in delivering a project. The fragmented nature of the industry has proven to be one of the barriers to sustainability implementation in the construction industry (Adetunji et al., 2003). When the project is completed, the team will often go their separate ways and what they have learned during the project might or might not stay with the project. Even if they bring the knowledge with them, it might be quite difficult to use it since they might work with someone else that may not want to adopt and consider the experience. Moreover, sustainability benefits can only be seen in the long run; therefore, who is responsible for monitoring the completed project after the completion? That would be another barrier to gaining a proven benefits of implementing sustainability measures in construction projects.

5.3.3 The RICS

When asked if the RICS is projecting and promoting sustainability, there were mixed responses from the NPs and the CQSs:

> *I'm not too sure really. They got resources that called the black book which list down all the competencies into the little sort of guide and theory, but I haven't really see too much from them as a body about sustainability…* (***np1***)

> *The RICS has play a part in helping change those rules and setting a new standard…* (***np10***)

I wouldn't say the RICS particularly goes out their way to promote it. I'm not aware of anything so yeah I think they could improve. I'm not aware of any specifically. (***p8***)

Have you read modus magazine? That, I think always promoting sustainability and BIM etc. (***p7***)

They advise the government certainly […] they'll be talking to the government about that type of stuff. (***p9***)

Apart from the quote from Participant ***p8***, there were four other CQSs who said that they were either not aware of or had not seen much coming from the RICS regarding sustainability. Participant ***p5*** specifically noted that, in terms of promoting sustainability in the industry, it is "invisible". The other two quotes from Participants ***p7*** and ***p9*** (including the others not mentioned in this section) mentioned that they had seen something about sustainability-related information coming from the RICS. Their responses, however, did not infer anything substantive. Thus, it can be deduced that the projection and promotion of sustainability by the RICS is not really apparent. This is further reinforced by comments from Participant ***np9*** below. As for the NPs, apart from the two mixed responses from Participants ***np1*** and ***np10*** above, the other four NPs (***np2***, ***np3***, ***np6*** and ***np9***) including two CQSs (***p6*** and ***p9***) mentioned about sustainability being part of the APC competencies. However, among these eight participants, two of them provided additional information where one (Participant ***np6***) said that the sustainability module was only optional; the other one said:

...you got like sustainability that you need to cover at competence but that is only like level one which is more understanding, so they don't ask you about what is your experience, how you've done on your project… (***np9***)

It can be inferred from these statements that the involvement of RICS is limited when it relates to promoting sustainability as well as lacking in emphasising sustainability as a key aspect during the APC.

5.3.4 Summary

In summary, work engagement with sustainability, either directly or indirectly, does have an impact on practitioners, especially their awareness of what is going on within the industry. Even though six NPs had not been direct involvement with any sustainability-specific work yet, their company had a significant sustainability programme, so they were aware of its importance on the company's agenda. However, when it comes to practising or embedding sustainability as part of their role, mainly as a CQS, that responsibility can easily be fulfilled if it is part of their contractual obligation. If that is the case, then they will do their best to achieve it. Their advisory role, on the other hand, can be reasonably tricky as there are not enough data or information out there to back up their suggestions. The question of cost is critical. Since they are part of the regulated body (the CQSs), they are obligated in making sure that they give the best service that they can. Their client should be well informed, and the information that they provided must be based on some relevant evidence. Otherwise, they might be facing a legal charge for incorrect information. From the CQSs' responses, their work involvement was concerned more with fulfilling their duty, i.e. fulfilling their contractual obligations. Nothing emanates from any personal initiative towards sustainability. In terms of sustainability, what can they, as a CQS, and as a cost consultant contribute to sustainability (Section 2.9.2)?

However, it can be noted that individual roles and responsibilities had sharpen the individuals' way of thinking and practices regarding the implementation of sustainability regardless of the RICS interventions, or lack of it. Therefore, in light of this, the next theme explores the

participants' perceptions of how they perceived their role and responsibility towards sustainability as current and future QS professionals.

5.4 Perceptions of the QS Role and Responsibility towards Sustainability

Most of the FYSs' believed that QSs have a role and responsibility in sustainability. Nine of them said that the responsibility is mainly to give advice, recommendations and assist in terms of materials choice, value engineering, and sustainable options. One of them mentioned the use of the LCC analysis to show the clients how savings can be made in the long run and suggests a more renewable source of materials and energy as much as possible. As an expert in cost management, Seah (2009) argued that QSs are in the best position to equip themselves with expertise in LCC. Utilising LCC can change the client's perception from prioritising cost to considering value from a long-term perspective (Al-Yami and Price, 2006). This is due to the fact that there many researchers had cited higher capital or initial cost as one of the primary barriers to the implementation of sustainable buildings (Hydes and Creech, 2000; Zhou and Lowe, 2003). Participant ***fy1*** felt that sustainability is not just about adding cost, it can reduce costs as well. The participant then added that:

> *...if it is a real claim and if there are concrete results that you can refer to at least; it increases a chance of people changing their mind...* (***fy1***)

Participant ***fy5*** claimed that even though QSs "don't directly have the power", they could initiate and advise the person who has the power. Participant ***fy9***, on the other hand, said that:

> *...everyone has a responsibility to be fair. It's not just one person sort of sole responsibility…* (***fy9***)

One other participant insisted that, during the procurement stage, the QS could recommend a contract that has more sustainable measures in it. However, two FYSs thought that the QS does not have a role in nor responsibility for encouraging sustainability practices as indicated by the statement below:

> *Actually I don't think QS can help because I feel like, like I just said, QS is the person the post in the middle of the project it's like QS can coordinate everyone but the role of QS doesn't really make a decision for example what method of construction you are going to use or what materials you are going to use so I feel like being a QS can't really help.* (***fy8***)

> *I don't think so, not that I'm aware of. I haven't see anything that has been done but with the role how QS is more on the consulting, advising, instead of the management that makes the decision, I don't think they can with their power […] I think they could advise the person who has the power but they don't directly has the power…* (***fy5***)

Participant ***fy5*** also added that:

> *...it has to be the client wants it or the client willing to pay for it not them (the QS) wanting to pull it in, I think they can initiate the kind of, this is what you can do but they don't necessarily have to, I think.* (***fy5***)

Participant ***fy8,*** on the other hand, argued that even though with the perception that QSs does not have any forceful impact to reinforce sustainability, he or she still believe in the importance of the concept. Participant ***fy8*** stated that, apart from being green, sustainability also relates to being innovative and this can be seen as impressive to those who are not involved in the construction industry. Highlighting how the industry can introduce sustainability to the society and community and, at the same time, make people feel good and be keen to adopt the concept. Even though Participant ***fy8*** was unable to connect sustainability with the role of the QS, this participant was the only FYS who made the link between sustainability and society at large.

This student was aware of the importance of sustainability at a meso (the construction industry) and macro level (the society at large). This outcome is probably due to the fact that the programme and sustainability elements ingrained in some of the programme's modules are not substantively link the concept with the QS profession as discussed in Section 5.2.2. The other reason was probably that these students do not have a clear understanding of the roles of the QS and are thus unable to see how it relates to the QS profession and how professionals can contribute towards sustainability.

Moreover, from the discussion on the previous themes such as PI in formal professional education (Section 4.2.2) and sustainability in professional education (Section 5.2), it has been identified that the level of involvement and engagement is different between students. Some of them, even from the responses of the graduates (NPs), they indicated that there were differing perceptions about those two themes. As previously highlighted, they engaged with QS- and sustainability-specific modules when they were in their final year. With that short duration of engagement and a few months' experiences in the industry, their conception of the two areas seemed to be very limited.

Most of the NPs also believe that the role and responsibility of QS professional in sustainability are in assisting and giving advice. Therefore, the QS has to make sure that clients are aware and to suggest sustainable options, thus attempting to interest and assist them in terms of design and help decide the cost. Two of them believed that with the knowledge that the QSs have, they are in a better position to assist and advice about sustainability:

> *...because we have such a good knowledge of building materials in general [...] we interact with lots of different groups in the construction industry I think we had such a good knowledge base [...] we have so much knowledge than people would take for granted [...] we have that advisory role we can sit with the architect and actually said this need to be more sustainable*

energy but I think just because we fundamentally we do cost construction we know what is more sustainable what isn't. (***np1***)

…one of the job of QSs are also critic what has been proposed why don't we do this […] just open suggestion because as QS work at several projects as well they will be with different client, structural engineers, architects and propose we did this on this job why don't we try here as well […] architect might be working on one project. QS, we could be working on five-six projects. We're very much involve with a higher spectrum of project and with that comes more knowledge in terms of what the buildings are doing in terms of sustainability what they are doing here and I feel like they do have a role in pushing sustainability agenda. (***np7***)

With their knowledge and experiences from various projects, specifically, those that adopted sustainability measures, the QS can use this knowledge and experiences in their next and future projects. One CQS believed so as well, he insisted that:

... you've got experience with all these different types of materials, and you should be feeding that back and to improve sustainability... (***p10***)

The rest of the CQS participants stated that their roles and responsibilities towards sustainability are mainly linked to their primary advisory role as a QS; giving advice and as well as assistance. Apart from offering their views and providing options and information, the QS might also include the rationale behind the achievement of cost-effectiveness. As their main function is in managing and controlling the financial aspects of the project, the cost is their main priority. The cost was also the main concern regarding sustainability as one CQS stated that:

…one of the challenges for a QS is that if a project is going over budget for any reason, and cost pressure is accounted in the project… (***p6***)

In addition, Participant ***p6*** added that:

> *...as a QS, we can heavily influence that by saying what we think to go in what we think the good value...* (***p6***)

That is why the QSs focus more on value engineering and in recent times, specialise more in LCC as quoted below:

> *…we won't design the building, we have views on good systems and options for sustainability measures […] we do look at lifecycle costing on project as well so as QS we do, we're not the main influencer, for me I think that is still for an architect to lead consultants as the main consultant…* (***p6***)

With regards to LCC, Participant ***p1*** stated that many decisions have been made through LCC where cost considerations were not solely made based on capital or initial cost but also the long-term running costs. Othman (2007) echoed this and added that, during appraisal preparation, LCC is often used to determine the feasibility of a project. Therefore, as suggested by Participant ***p7***, QSs need to be aware of existing technologies that not only able to help in the building of a project and to meet the sustainability criteria but it can also be used to comply with the regulation and cost aspects as well. Participant ***p10*** agreed by adding that, through LCC, clients can see an improvement in the cost and sustainability of the building. However, Participant ***p10*** argued that,

> *...if you do the life cycle costing exercise for a client and extra cost and they don't always want that extra cost...* (***p10***)

Cost issues are one of the primary challenges faced by a QS, especially (as stated by Participant ***p6***) if a project is going over budget, and there are cost pressures on the project.

Participant ***p8*** added that:

> *...the best option and also the best one for the environment may be not the best one for the client...* (***p8***)

As discussed in Section 2.2.4.6, high building costs are a major barrier in sustainability implementation in a construction project (Eichholtz et al., 2010; Neal et al., 2000; Revel and Blackburn, 2007). Bartlett and Howard (2000) stated that there had been a proven benefit of 'green' building to business and environment. The authors thus suggested that a comprehensive consideration of LCC together with sustainability can deliver long-term value for sustainability to the client. Therefore, as a cost consultant, Participant ***p1*** stated that even though QS is brilliant at LCC, they need to be better at it (the importance of LCC in the decision-making process). If they do not have the skills in LCC, the best thing that they can do is to offer views and information on good systems, values and options for sustainable measures to their clients. Afterwards, it is up to the client to decide, as Participant ***p3*** emphasised:

> *It's not my job to tell the client what he can't do. It's his money. He can spend his money how he wishes to ...* (***p3***)

Apart from providing cost advice, the QS is also responsible for providing options that may not only be cost effective but also fulfil the requirements of sustainability criteria to their clients. This is due to the fact that most clients are not aware of the available options and solutions that can help make their project better in terms of cost, quality and sustainability.

The quotation by ***p6*** above also indicated that an architect is the leading influencer of sustainability in a project. The other six CQSs shared this view:

> *…sustainability is more of a department of the architect…* (***p2***)

As a QS, that's difficult it's more in the hands of a designer who would be able to design using sustainable materials. A QS is not normally involved in the selection of materials so that's the designer's more... (***p4***)

We rely on the designers to be innovating in that area, and we support them… (***p5***)

To some extent, we respond to the specification, and that's driven by the designers and their respond to the regulations. (***p7***)

…you wouldn't be designing something would you? You would be proposing something. You would be the second in the chain of shall we have it or not have it. (***p9***)

...if you had experience with costing a different type of materials then you should speak to the architect and say that's actually gonna be cost saving... (***p10***)

From these responses, it can be seen that sustainability measures are more in the hands of an architect and designers. Three NPs (***np5***, ***np6*** and ***np10***) who have been practising for more than a year shared similar opinions. Participant ***np6***, for example, said that:

…we don't design the sustainability elements. We don't do too much of criteria that meet BREEAM standards… (***np6***)

BREEAM, as discussed in Section 5.3.1, is stated by three NPs as the certification that was the most applicable in their company's projects that are related to sustainability. In this regard, five CQSs (***p1***, ***p5***, ***p6***, ***p8*** and ***p9***) mentioned BREEAM as part of their involvement with sustainability. The adoption of this certification was either requested by clients or part of the planning requirements. Three of them (***p1***, ***p8*** and ***p9***) gave a slightly negative opinion towards BREEAM where two said that it was not working, by saying that:

In energy performance certificate, they were all tick the box but not really worked... (***p9***)

The other participant said that:

> *Things like working with the sustainable homes, BREEAM, a bit of the pain in the neck really but you have to build it in as the course of the job, but it's for the right reason overall.* (***p1***)

Apart from BREEAM, eight of the CQSs stated that being involved with sustainability is part of their job requirements as one said:

> *...where contracts and the employer require sustainability to be a key consideration; which usually a public contract. It is an obligation of a QS to seek to make sure that all elements of the project do their best to design the best to lip service to sustainable.* (***p2***)

It is apparent that it is the responsibility of the whole team in terms of what is needed to be delivered for sustainability. It is their obligation to make it work as best as they possibly can. As members of the RICS, they are bound by their professional and ethical standards to always provide a high standard of service by giving the best advice, support or performance (RICS, 2007b) as described by the two CQSs below:

> *…a responsibility to ensure that particularly where contracts and the employer require sustainability to be a key consideration which usually a public contracts, it's an obligation of a QS to seek to make sure that all elements of the project do their best to design the best to lip service to sustainable.* (***p2***)

> *…if you got a specific requirement particularly through the planning condition, which need to be discharge, I think that means that the responsibility on the whole team is very clear in terms of what is need to be delivered for sustainability…* (***p6***)

The two quotes indicated that public contracts, planning requirements as well as policies are all integral part of sustainability and they are directly influenced by government regulations. Government, as an institutional enabler, is one of the key drivers of sustainability (Liyin et al.,

2006; Ozorhon, 2012). According to Akadiri and Fadiya (2013) government regulations are classified as an important determinant factor that drives sustainability practices in the construction industry. Regulations, legislations and policies can provide a clear direction for sustainability (what is required and how it can be achieved) to be implemented and all the construction industry's stakeholders and actors do not have another choice but to try and find ways to conform to them.

The summary of all the responses from the FYSs', NPs' and the CQSs in relation to their perceptions on the roles and responsibilities of QS towards sustainability are illustrated in Table 5.4. Table 5.4 illustrates that, as one of the professional advisors (financial aspects) in a construction project, most of them maintained that their primary role and responsibility for sustainability was to advise the client and the other members of the design team. According to Seah (2009), the strength of the QS in green costing is the ability to adjust high-level cost models to fit the budget and yet inform the design consultants about the parameters of efficiencies, design factors, concepts and controlled quantities factors and rates. The table also exhibits how the awareness regarding their roles and responsibilities towards sustainability grows from the times they were students and novices to the position of CQSs that they now held. Even though the findings from Section 5.3 indicated that education did provide students with the awareness about sustainability, this is only influenced by the fact that, when they (graduates) embark on their career, they have yet to receive a high level of exposure, especially through a project.

However, their APC preparation had made them more aware of the QS's roles and responsibilities towards sustainability compared to FYSs. As noted by Kopnina and Meijers (2014), there might be a gap between the assumption that knowledge and awareness gained

during professional education can lead to motivation, and the actual behaviour towards sustainability issues.

Table 5.4 Summary of QS role and responsibility for sustainability

ROLE & RESPON.	*fy*	*np*	*p*
Advisory role	***fy1-*** Considering sustainable materials. ***fy2-*** Advice or decide on materials. ***fy3-*** Advice or recommending, through financial aspect like LCC. ***fy4-*** Advice on materials & products; LCC analysis. ***fy5-*** Consulting & advising, but no direct power, initiate through options. ***fy6-*** Through value engineering & better choice of materials. ***fy7-*** Procurement stage; opting for contract with sustainable measures. ***fy9-*** Try & price sustainable alternatives, options. ***fy10-*** Provide ideas through whole LCC.	***np1-*** Advising client & architect on cost & materials as QSs have good knowledge on these aspects. ***np4-*** To make client aware of options & cost effects of those options. ***np5-*** Building process; hire good subcontractor. ***np6-*** Morally suggestions options. ***np7-*** Critic & suggest with their knowledge. ***np8-*** Assisting with the design & help decide on cost efficiency. ***np10-*** Advice clients; cost plan, options, spark up their interest.	***p1-*** Offer view through LCC. ***p3-*** Provide information to client to make positive decisions. ***p4-*** Reasoning on cost effect. ***p5-*** Costing; cost impact. ***p6-*** Views on good system, options & values, LCC. ***p7-*** Through value engineering, lateral thinking, asking questions & making suggestions. ***p8-*** Options and cost impact to the client. ***p9-*** Proposing something, asking questions. ***p10-*** LCC, giving options through their knowledge & experience.
Job's obligation		***np3-*** Company's CSR. ***np6-*** Help meeting BREEAM standards. ***np9-*** Contract obligation. ***np10-*** Help client achieve BREEAM rating.	***p2-*** Through contract & employer; usually public contract. ***p6-*** Planning conditions. ***p7-*** Respond to specification.
Others' role	***fy8-*** Don't think QS can help; don't make decision on construction methods & materials.	***np5-*** Not involve in technical side like materials used. ***np6-*** Not in the design; not us who put it in. ***np8-*** No direct involvement. ***np10-*** Not our ultimate role. Architects & engineers' role.	***p4-*** No direct effect, in the hands of designers to use sustainable materials. ***p5-*** Rely on designers to be innovating. ***p6-*** Architect to lead. ***p9-*** You wouldn't be designing, second in the chain of decisions.
Client's want	***fy5-*** It has to be client want or willing to pay.	***np10-*** Depends on what the client wants.	***p4-*** Often driven by client's need.
Barriers		***np2-*** Sustainable solutions can be more expensive; QS say no	***p3-*** It has to be credible. ***p6-*** Budget and cost pressure.

		to it more than they should.	***p8-*** ***p10-*** Hard to find cost data. LCC can leads to extra cost & client don't always want it.

From the NPs' experiences within the industry, they had insights into what is actually happening in practice and within the industry. However, since they do not have the opportunity as yet, the research was unable to determine their sustainability behaviour and motivation in relation to practice. If they personally place a value on sustainability, that might or can be the driving factor for them to practice and be the agent of sustainability as CQS ***p6*** proposed:

> *I think as chartered professionals, so I think we all have a moral responsibility to consider sustainability and I do think that we do that.* (***p6***)

Therefore, when it comes to promoting and ensuring sustainability within the BE in the long-term, it is a matter of combining an individual's expertise with a particular approach, mind-set, and attitude in exercising one's profession, i.e. through individual professionalism. Even though it is unreasonable to assume that changes can be obtained at an individual level, it is an important prerequisite when it comes to sustainability. Individual motivation is critical for the construction industry to change, suggesting that there are right and wrong reasons for taking environmental action (Pooley, 2016). Individual purpose can turn into a collective goal through teamwork or within an organisation of which the individual is a part. Professionalism in this context could be referred to as the work ethic of a professional. According to Aho (2013: p.113) professionalism, within the context of sustainability, could be referred to as sustainable professionalism that means a "consistency and integrity in applying one's skills and competencies for the benefit of the community".

In relation to the collective goal, as previously mentioned, it is not an easy task to achieve. This is because, within a team, for instance, there are several different professionals with a variety of specialisation. Each of them is regulated under different professional bodies and will have to

abide by their own set of values and standards. These professionals also may have different opinions based on their background knowledge and experiences. Therefore, to come to a consensus, especially in terms of the abstract concept of sustainability, might not be easy. The other obstacle would be due to constraints from within an organisation where the professionals are not just being regulated by their professional body, but at the same time, their work is also being controlled by their employer. In addition, an organisation has its own goal and objectives. Hence, as part of this organisation, the professionals should also comply with the parameters set by the organisations. Consequently, individuals' professionalism in sustainability might be hindered by these constraints and conflicts. These aspects will be discussed further in Chapter 6 when the findings on the interplay (if there is any) between PI and attitudes towards sustainability is presented.

The research also found that, when describing the QS roles and responsibilities for sustainability, none of the participants relates it to the broader public or community. Most of their responses were about their clients and their obligations to the work that they had signed up for (contractual obligation). Meaning that the sustainability measures embedded within the project were initiated by the clients and the architects or they are part of the regulations and not directly derived from the QSs as part of their aspiration and motivation for the greater good. What does this mean? Do they have any influence when it comes to sustainability? Should serving the public at large be part of their professional moral and ethical responsibility? These issues are related to the concept of professionalism. How should professionals enact their role? Are they being restricted by their organisation as opposed to exercising their professional judgements? These questions will be addressed in Chapter 6. The next2 discusses the influencing factors that contribute to the emergence of sustainability among students as well as the practitioners in this research.

5.5 The Influencing Factors on the Formation and Development of Attitudes towards Sustainability

Based on the previous discussion in Section 5.2, it is apparent that learning does create awareness about sustainability regardless of the level of education. Therefore, if students learnt about sustainability, then their awareness of sustainability had already taken form even before an individual student started his or her formal professional education. The concepts continued to develop during the educational stage and all the way when he or she enters the workplace and develop his or her career. Along this journey, there would be factors that influence the development and even strengthen the individual's attitudes towards sustainability (see illustration in Appendix F). Discussion about these factors is divided into two contexts: one is during the formal professional education, and the other one is during the working stage.

5.5.1 Formal professional education

Based on the discussions in Section 5.2.2, when students and graduates were explaining their engagement with sustainability during their studies, they mentioned their involvement in particular modules (sustainability-specific module, projects modules, Project QS module, Information and Communication on design software). One FYS said that they learnt sustainability and it can be inferred that the sustainability aspects have been incorporated into some of the programme's modules. A desk study of University's QS programme showed similar findings. Two graduates or NPs said that they learnt a considerable amount of information about sustainability and it had been a big push during their studies. However, they did not mention anything specific. Concerning the interview responses by the participants from the two categories, the research concluded that sustainability-specific modules and projects modules (including Project QS module) are key influences in the materialisation of sustainability awareness during the professional education stage. For instance, the sustainability

module (as an independent module) adopts a deeper approach that can be easily applied in various disciplines. This can help students develop understanding and awareness of the issues regarding sustainability (Hayles and de la Harpe, 2007). A study by Iyer-Raniga et al. (2010) provides empirical evidence of this approach where, through a pre- and post-survey, the study found a marginal improvement in the students' understanding of some aspects and concepts. According to the authors, this outcome was because the module only formed a small component of the whole programme. A study by Celik et al. (2014) found a strong relationship between students' environmental responsibility and their sustainability-integrated curriculum. Their results suggested that students who took the sustainability course were more environmentally responsible than their peers who did not do so. The incorporation of a reasonable amount of sustainability into an existing programme structure increases students' understanding (Lim et al., 2015). The students stated that it was useful for their future career, and they mentioned that they had been asked about sustainability during their job interviews. The findings from Lim et al. (2015) were aligned with this research where the implementation of sustainability concepts in a programme structure did provide the students with a certain degree of understanding and awareness as well as develop their perceptions about the importance of sustainability.

5.5.2 Working stage

Based on the discussion in Section 5.3, it was apparent that most of the novices were not directly involved with sustainability. However, they explained that the company they are working with had a strong sustainability agenda. Being aware of their company's sustainability approach had made them mindful of sustainability as well. Since they were new in the industry, their exposure is still lacking. According to Augsburger (2009), exposure to sustainability practices will increase awareness of issues and concerns about sustainability. The CQS participants, on the other hand, have been practising for more than five years and have been directly involved with

sustainability on the projects that they worked with. Thus, experience played a significant part in influencing sustainability, especially in terms of awareness and how and where they, as a QS, can contribute. Learning through doing and being exposed to, or be directly involved with sustainability has a significant impact on individual practitioners as they can directly observe the benefits gained from a consideration of sustainability (Cruickshank and Fenner, 2007). Koigi (2017) claimed that exposure to sustainability is crucial for QSs to effectively contribute to the efforts to adopt sustainability in a project.

5.6 Conclusion

It can be concluded that although the responses were varied, the University did expose students to sustainability. Their formal professional education provided students with an understanding of sustainability. Are they able to put into practice what they have learned? Responses from the novices indicated that they have yet to have the opportunity as they are still in the early stages of their career, and there is still a significant amount to learn. Do they show or have any personal commitment to sustainability? A small number of them seemed to have it, but the research is unable to determine the level of commitment as they did not have a chance to execute it yet. How about the CQSs? If valuing sustainability is part of who they are, then it was not apparent from their responses. Their responses did not indicate any agency for sustainability. Even though commitment would be difficult to internalise and explore, it did begin to reveal a space where experience and learning can inform value and behaviour (Evans et al., 2013; Schultz et al., 2005).

Chapter 6: Interplay between the Emergence of Professional Identity and Attitudes towards Sustainability

6.1 Introduction

This chapter is the third and final chapter of the findings of this research. The previous two chapters (Chapters 4 and 5) discussed findings on the formation and development of professional identity (PI) and attitudes towards sustainability. Therefore, the discussion here would be based on the two chapters and will address the last research question: *what interplay, if any, exists between the two concepts and how could this help contribute towards more sustainability practices*?

As part of the client's main advisory team, QS professionals, with their knowledge and skills (primarily in the financial and contractual aspects of a construction project, are well positioned to champion sustainability performance in a project. QSs have the potential to act as a moral agent of change. However, as discussed in Section 2.9, although QSs have a considerable potential to move sustainability forward, there is a lack of evidence of this happening in terms of QS practices and contributions. This issue brings into sharp focus the tensions between acting in the short-term interest of the client (client's satisfaction) and acting in the interest of broader society.

Therefore, the question explored in this chapter is the interplay of the tensions that exist between the view of the greater good, i.e. sustainability versus the short-term need to win works, to satisfy the client, and to do the job. Doing the job without placing any judgement of whether it is bad if they do not do it. This interplay is what this research is trying to do; to use

the framework to interrogate any tensions that exist between the two and how this play out across various snapshots in the journey from formal professional education to becoming chartered professionals.

Figure 6.1 is a summary of the research framework as mapped out in Section 3.3.3.

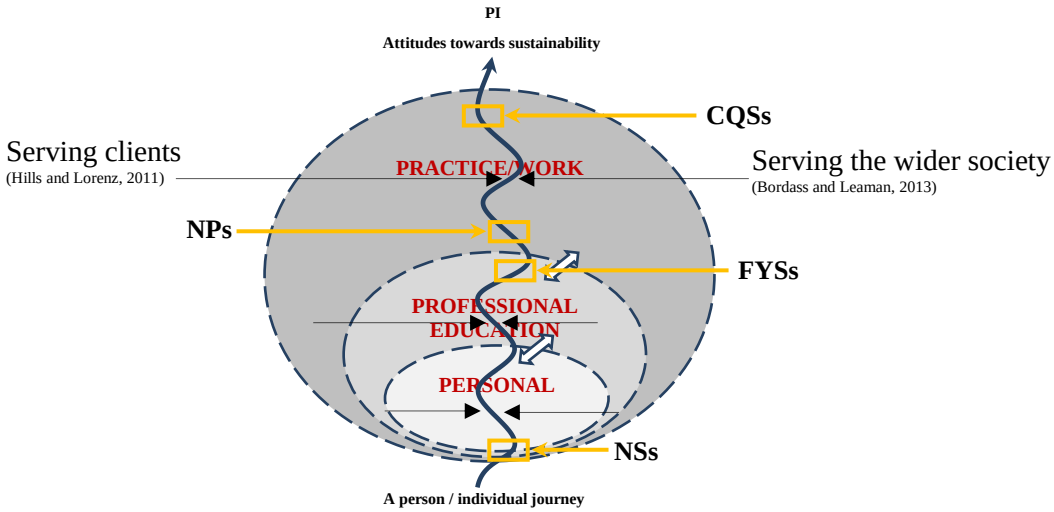

Figure 6.1 Research Framework: four different snapshots of the journey

The figure illustrates an individual's journey (the wavy line) in the formation and development of PI and attitudes towards sustainability. The wavy line shows it is not a straightforward journey as there will be factors (internal or external - the black arrows on each side of the wavy line) that may influence the emergence of the two concepts. The journey begins with future professionals enrolled in formal professional education until to the point where they are chartered and in a position that enables them to influence their work. The data is captured from four different snapshots along the journey; (i) new students (NSs), (ii) final year students (FYSs), (iii) novice practitioners (NPs), and (iv) chartered quantity surveyors (CQSs) in order to identify the tensions that may exist along the way.

The findings and discussion in this chapter are presented based on the four snapshots.

6.2 New Students

Most of the NSs have been exposed to sustainability prior to their formal professional education. As discussed in Section 5.2.1, the exposure was either through the incorporation of sustainability in specific subjects in school or through a school's food and waste recycling schemes. The exposure (regardless of its level) made the students aware of the importance of sustainability as quoted below:

> *...every step we take now is affecting the next to the next to the next generations and to survive and take care, not be selfish. Yeah it's really important to start now then.* (***ns4***)

> *...every human are responsible for it [...] either being professional or not you have responsibility to care the world sustainable...* (***ns8***)

> *I like to think that I can going to do that to make sure that buildings in the future on my project that I work for in the future I can sort of try and make sure that they are as sustainable as possible...* (***ns1***)

> *If I do become surveyor, I just make sure all my buildings are sustainable as possible because it is important to make sure that they are.* (***ns2***)

From the four quotations above, Participant ***ns4****'s* belief was that it is important to start to care for sustainability now while Participant ***ns8*** believed that every human being is responsible for it and not just certain people like the professionals. Participants ***ns1*** and ***ns2***, on the other hand, stated that when they started working; they would like to contribute towards sustainability through their work and role in the company. Among these students, Participant ***ns1*** seemed more enthusiastic about it than the others. Sustainability is one of their favourite topics in

school and from the information gained about the QS profession; Participant ***ns1*** thought that a difference could be made through the profession with regards to sustainability and added that:

> *...hopefully I might even consider going to that side of it if there's an option for it.* (***ns1***)

It would be insightful to interview this student again towards the end of the programme to explore changes (if any) in that perception. However, it will not be viable for this research to do so as the cross-sectional design has been adopted.

Nevertheless, it can be inferred that these students have shown signs of changing times with greater awareness of sustainability. The differences in the level of awareness may be due to the internalisation of sustainability as part of their sense of self. Alternatively, is this a sign of latent potential in the students becoming QSs to be a moral agent for change where they become the champion of sustainability rather than depending on others (e.g., client or legislation; see Section 2.2.4)? The next section discusses the tensions that played out during formal professional education.

6.3 Final Year Students (FYSs)

Similar to the findings from the NSs, some of the FYSs also had a general idea and awareness of the QSing profession and sustainability before they started their degree programme. As they started their formal learning, they learnt more about the two concepts.

6.3.1 Inclination towards sustainability

In order to gauge whether FYSs would mention anything about sustainability before any questions related to sustainability were asked, one of the questions asked was what kind of changes that they would like to see in the construction industry in the future. Among the changes that they would like to see, three of the FYSs specifically said that:

> *I hope that it'd be more sustainable but sustainable is quite a big word [...] more like smart building [...] because the climate change [...] too many pollution is coming from human so if we don't start on making buildings that reduce the polluting effects or like the CO2 [...] I think definitely like it won't be habitant for human anymore if we don't start to be aware...* (***fy4***)

> *Just personally for me [...] sustainable construction and I still didn't feel there are changes in a lot of areas in sustainable construction...* (***fy7***)

> *I hope that there will be more sustainable building which is good for the society.* (***fy8***)

These quotations indicated that these three students were aware of the importance of sustainability and thus wanted the construction industry to be more sustainable in the future. Furthermore, Participant ***fy8*** believed that it is not just crucial for the industry to be sustainable and green but also stated that:

> *I think it is also being innovative and impressive to the people which is not in the construction industry. I mean the other people they may feel good and feel like it is something new to the society to the community...* (***fy8***)

This student believed that the industry could make changes not only within the sector but also it could reach people far beyond and thus contribute to a broader area. However, none of the NPs and CQSs mentioned sustainability as changes that they would like to see in the

construction industry in the future. What does this mean? Would it be safe to infer that sustainability is not something that had entered their thoughts and that they would consider?

Nevertheless, seven FYSs believed that the QSs have roles and responsibilities to contribute to sustainability. Participant ***fy6,*** in particular**,** is already thinking about making changes if given an opportunity:

> *...hopefully in the future when I do have position of more authority and I'd like to think I still keeping my views of sustainable I am quite pro sustainable I don't believe in weak sustainability it's all about strong sustainability so hopefully [...] in the future I will then be able to work towards helping whatever organisational work for to become more sustainable.* (***fy6***)

From the quotation above (***fy6***), it can be inferred that this student was already developing attitudes towards sustainability and planning on making changes through the role and position that the student will attain in the future. Are these four students unexperienced or do they represent the potential moral agent for change for sustainability?

6.3.2 Authoritative position

Participant ***fy6****'s* belief was that only people in authority can make changes happen. A similar statement echoed this idea:

> *I think anyone in sort of like in senior position can influence by offering advice or recommending things yes I definitely say QS in this.* (***fy3***)

Therefore, with this perception, these students might not be tempted to do anything when venturing into the workplace but would do something once they are in an authoritative position as seen in this remark:

I don't feel like I get any say in it at the moment but when and if I did then I think that would be quite high on my agenda [...] I think they definitely got a massive responsibility in certain QS role that might not be mined just yet. (***np4***)

This quotation demonstrated that the novice is keen to practising sustainability and was aware of the QS's role. However, since the participant was still new to the field and had only been practising as a QS for just over two years, his/her experience and the exposure had not provided the participant with sufficient voice and responsibility. Even the rest of the NPs' responses during the interview did not indicate anything (even apart from sustainability) regarding their initiatives of trying to do something on their own accord to contribute to their role. It was more about how they would deliver what they have been asked to do. In other words, follow orders. Therefore, even if they have the potential to become an agent of change, do they still believe that their voice would only be heard if they were in a particular position and thus their current position stopped them from trying until they attain that position? Participant ***np4****'s* quotation suggests that this might be the case.

6.3.3 Contrasting opinions

The four FYSs (***fy4***, ***fy6***, ***fy7***, and ***fy8***) discussed in Section 6.3.1 showed that they would like the construction industry to be more sustainable with one is being slightly more enthusiastic about to trying making changes towards achieving that. Apart from ***fy8***, the other three (including the other four FYSs) also believed that QSs can help in achieving sustainability in the construction industry. The other three including ***fy8*** had slightly different opinions:

It makes it more expensive. It's good for the whole planet but not specifically for the construction [...] this industry pays more than what it's earned really. (***fy1***)

I don't think they can with their power [...]even though they are chartered [...] it has to be the client wants it or the client willing to pay for it not them wanting to pull it in, I think they can initiate the kind of, this is what you can do but they don't necessarily have to, I think. (***fy5***)

Actually I don't think QS can help because I feel like, like I just said QS is the person the post in the middle of the project it's like QS can coordinate everyone but the role of QS doesn't really make a decision for example what method of construction you are going to use or what materials you are going to use so I feel like being a QS can't really help. (***fy8***)

From the above three quotations, three main points can be extracted, and they are discussed below:

i. Cost issues

From the quotation, Participant ***fy1*** seemed particularly concerned about the financial aspect and thus might have this view that if putting sustainable measures will incur more cost, then it might not be considered in a project. This student's statement was similar to one given by one of the CQSs as illustrated below:

...you can only consider options if you know the cost of it [...] there's so many options now [...] the best one for the environment maybe not the best one for the client... (***p8***)

ii. Based on client's willingness

Participant ***fy5*** has this understanding that the adoption of sustainability will depend on the client; whether or not the client wants to adopt sustainability and is willing to pay the extra cost (as discussed in point (i) above) if he/she adopts sustainability in a project.

iii. Not the roles of QSs

Participants ***fy5*** and ***fy8*** believed that QSs could not offer any help in relation to sustainability. Unfortunately, this understanding was similar to one of the CQSs:

> *A QS is not normally involved in the selection of materials [...] although the QS might be in reasoning of the cost effect on that but to answer your question probably, directly, we wouldn't. I don't think we're having a direct effect on sustainability.* (***p4***)

iv. Image, identity and reputation purposes

It is also worth noting that Participant ***fy5*** said that QSs could initiate sustainability but "they don't necessarily have to, I think". How has this student reached this perception? From the student's other responses, it is evident that he/she did not have a favourable opinion about sustainability as illustrated below:

> *For project QS [...] you also have to take into account of the sustainable consideration because that's what people have to care about or attempt to care about compared to the past few years because of more concern about the environment.* (***fy5***)

> *I think it's because people know that in the construction industry so you construct, you demolish, you displacing a lot of impacts on the environment so somehow through sustainable consideration you have to pay back or offset the impacts they are making to the environment.* (***fy5***)

These two quotations might have to do with the next statement made by the student where he/she stated that sustainability adoption is more to do with image, identity and reputation rather than caring for the environment.

> *From what I learnt, for example, people who built a house they put in sustainability measures [...] for their company image, reputation and from what I learnt in green innovation so identity to be, what I learnt is rational, I can't remember but one time they will be doing this measure to save money but one is their identity to sell themselves to be different to sell their image of caring about the environment. For example staff using hybrid car instead of branded cars, so it's definitely identity.* (***fy5***)

Therefore, with this kind of perception, the students might not see sustainability as necessary and consequently, it will not become something of value either personally or professionally.

One other point illustrated by the above three quotations was the connection that students made between sustainability and their future profession. Through learning about their future profession and sustainability, students could associate the two concepts, and it was found that some of them had similar opinions to the CQSs. This outcome illustrated the emergence of PI.

However, this PI might be developed without sustainability as one of the key barriers to sustainability adoption because it is associated with higher capital cost and clients' demands (see Chapter 2.3.2.3). Therefore, with this view about sustainability being expensive and also possible client's rejection or whether it was mere for image purposes, these students/future professionals might not have internalised sustainability as part of their professional self or something that they value. The reasons for this are first, as their future role will focus on cost management and there may be higher capital costs, they were convinced that this might not be attractive to their clients, and so they would not want to adopt it. Secondly, if sustainability was being used to cultivate the 'green' image or for marketing purposes, it might not be worth placing too much emphasis on it in a project (i.e. emphasis on the benefits of sustainability towards the environment, social and economy).

Nevertheless, through the programme, a number of students can internalise the value of sustainability, having a positive attitude towards it and were also able to identify the QS profession's roles and responsibilities with sustainability (i.e. able to link sustainability with their future professional role). Therefore, do these students represent a potential moral agent for change? Would they be able to move sustainability forward within their project and place of work? The next section discusses these questions through the lens of NPs. Even though this research adopted a cross-sectional design, the NPs and FYSs were from the same university and the same generation with only a maximum of three years apart. Therefore, their sustainability exposure might be similar as opposed to the CQSs. One could assume that when the CQSs were in university; sustainability might not have been given considerable emphasis.

6.4 Novice practitioners (NPs)

Similar to the FYSs, the NPs said that they learnt about sustainability during their undergraduate degree programme. Their responses were quite similar to the FYSs'. Two of them (***np6*** and ***np7***) said that the programme caused them considerable stress.

6.4.1 Misalignment between learning and practice

Participant ***np6*** added that since it has been emphasised so much during the degree programme, he/she expected that when they started work, every project would adopt sustainable measures. However, it did not happen as anticipated:

> *...it's not common place I thought it'd be [...] out here it is down to client want it but it's not the main focus of the project [...] it's like a side project within a project [...] maybe over time five to ten years be able to see a lot more sustainable stuff happen [...] I hope you get to the point where that's more common than we are now because obviously now a lot of the basis is*

around targets or missions stuff or public image of oh this is BREEAM excellent building. I think that is what drives the client. (***np6***)

There could be many interpretations that can be extracted from this quote by Participant ***np6***, for example:

i. Not common in practice

Participant ***np6*** sounded almost disappointed when he/she discovered that in the industry or practice, sustainability is not as common or one of the main focuses of a project as the degree programme led them to believe. Is this a misalignment of what is taught and what is expected? If this is the case, then these NPs will think that what they learnt about sustainability during their degree programme is not relevant and so might not even try to practice it. How will this impact on those who enter the industry in terms of a tendency to become the moral agent of change? In addition, does this statement infer that sustainability education is too bounded by sustainability as a discipline and associated concepts? Does education need to be rethought in order to develop graduates who are more explicitly aware of the change needed and thus equipped with the knowledge, skills and competencies to enact that change?

ii. Not part of the main focus

Sustainability is still not part of the main focus of a construction project: "[it is] a side project within a project" (***np6***). Participant ***np5*** said something similar:

...sustainability is on your last thought if you produce certain amount of tonnes of carbon a year, people like what it doesn't really matter if you produce as much waste no really [...] biggest thing with sustainability at the moment that is no one really knows what it is. They think they do but they don't. (***np5***)

This statement illustrated that one of the reasons why sustainability was not the main focus is probably was due to the lack of knowledge in the area (see also Section 2.2.4.4).

iii. Image, identity and reputation purposes

Sustainability adoption is mainly enforced through a rating system that is being associated with the projection of the 'green' image as discussed in Section 6.3.3.iv. This approach was echoed by another NP as quoted below:

> *We try and I think it's silver we aim for in all of our building that we work on and we aim for it [...] we don't necessarily always get a certificate at the end because of the cost involves it's more of a so we can say we've done it rather than that anyone really that interest in it I suppose...* (***np4***)

> *...I can't remember what its call now, safe contractor? I can't remember what it call but the certificates that you had I think you have to have sustainability kind of forward or certificate or something you put out there that you said we have got a something to say that we gonna try and be sustainable but again I think that was just a tick box exercise and actually it always comes down back to price especially with the contractor especially the small one.* (***np4***)

The statements made by Participants ***fy5*** (see Section 6.3.3) and ***np4*** above seemed to relate to the concept of 'greenwashing' (see Section 2.2.4) as illustrated in the quotation below:

> *...we have seen a few clients to get involve to what I call greenwash which is spending money on sustainable things just because it looks good not because of any real value. For marketing purposes, which is to me as a waste of time really they put on the green roof or something and two, three years later dead, it doesn't water properly and looked after.* (***p1***)

Is this the short-term commercialism manifestation of sustainability as opposed to the long-term benefits for the greater good? If this is the first thing that they are exposed to in their early careers, how might this shape their values and perceptions? How are these novices going to promote sustainability to the client when they do not value sustainability and do not see it as worthwhile?

6.4.2 Learning from example

Furthermore, since the NPs are relatively new to the industry, most of them said that they were learning a lot from their superiors and colleagues, especially their line manager (responsible for their professional development). As one of the participants from CQSs explained:

> *When you are new to the industry, you are shaped by your peers […] more likely on who your line manager is and ultimately who you report into.* (***p6***)

This statement may mean that the early-career QSs will learn a lot from their senior colleagues and also that they might eventually develop similar traits and thoughts as their seniors as illustrated in some of the responses below when asked what have influenced who they are now:

> *...the biggest influence probably is your peers, people above you and how they behave and you learn from them, you learn experience, you learn how they behave in the past and you then hand that down to more junior staff.* (***p1***)

> *...my business partner here taught me everything really, and some of the other colleagues here taught me everything about what it means to be in private practice, which is different. It's not about self-interest per se. We do a job for a client, and obviously, we get paid for it, but we need to properly.* (***p7***)

Probably my two bosses. One, he is my boss now [...] he is very client focus and professional. My last boss [...] mentored me from my RICS were more practical and professional with it [...] but you have to work out his ways, and he is quite old, traditional old QS but he still wants everything right and so that do influence that. (***p9***)

The three quotations above can be interpreted positively and also negatively in a sense that they might learn considerably from their peers and superiors:

i. Their behaviour

Opting for short-term financial gain and refusing to consider sustainability in a project is not unlawful action or behaviour unless legislation mandates it. Therefore, there might be a tendency that the early-career QSs to follow these kinds of behaviours. In addition, some of their senior colleagues might have a certain way of working (as quoted by ***p9*** above) with which they are already comfortable and might find it hard to change. They may want their junior associates to follow their way of working. Participant ***p1*** also stated something similar to ***p9*** as quoted below:

Very, very hard to change the older views. I've struggled. I've got older one in the office. Very, very difficult to change their opinions once their form in setting concrete for a long time almost impossible to change them. Not entirely impossible but quite difficult. You've got to wait for that generation to leave the industry and then new generations to come in to change that thinking […] The older ones a bit more resistance (towards sustainability) possibly they've seen it as a bit more sort of trendy thing that they don't want to be interested in... (***p1***)

Since ***p1*** is the Managing Director of the company, therefore, that kind of behaviour might not influence ***p1's*** own behaviour as much. On the other hand, for the early-career QSs, it is a different story since they were still finding their feet in the job and they might want to impress

or to be on the right side of their superiors to avoid conflicts. In this instance, they will follow whatever their superiors were asking them to do and doing them especially when it is concerned with their line manager who was responsible for their professional development. The portrayal of attributes from senior colleagues, including attitudes towards sustainability that these early-career QSs were following might eventually become part of their professional self and who they are, either positively or negatively.

ii. Their priority

Moreover, conforming to the same characteristics as their peers or superiors might also be similar to focusing solely on the client - as stated by ***p9*** where the participant's current employer is the very client focused. When the newcomers see this attitude from their senior colleagues and moreover from their employer, they might think that it should be their primary focus as well. It is not wrong to put the client first, but there needs to be a balance between serving the client and the broader public as this is part of their responsibilities as part of a regulated profession. Discussion of the regulated profession will be discussed further in Section 6.5.

As suggested by Hegarty (2008), professionals' initial subjectivity or selfhood is formed through engagements during their earliest career. Therefore, if their mentor or role model did not portray any interest towards the greater good, for instance, then the newcomers might conform to the same attitude.

6.4.3 Roles and responsibilities of QSs towards sustainability

In addition, engagement with work on a daily basis and preparing for the APC has increased the NPs skills and knowledge of their profession and professional roles. Preparing for the APC also makes them aware of the profession's moral and ethical responsibilities as a number of

them had explained; based on the RICS's professional and ethical standards as shown in Table 6.1.

Table 6.1 Novice practitioners' perceptions on their PI, QS moral and ethical responsibilities, and QS roles and responsibilities for sustainability

	PI descriptions	QS moral and ethical responsibilities	QS sustainability roles and responsibilities
np1	*I'm still quite new [...] very keen to get as involve as possible [...] to get experience and build up more knowledge [...] work on my APC do some background reading [...] make sure that I'm engage as possible [...] work hard because APC is my main focus so at free time I spent on that really.*	*...respecting the client [...] everyone else [...] really important to look after the client to listen to what they want [...] they don't have the same level of knowledge of anyone else that they working with [...] being sensitive to them and helping them feel more involve in the process [...] delivering the project to the best of your ability and making sure that it's sustainable...*	*Responsibility to give advice [...] the architect, the client [...] people think QS is just do cost and that's it [...] we can sit with the architect [...] said this need to be more sustainable energy [...] fundamentally we do cost construction we know what is more sustainable what isn't [...] knowledge we got [...] we could push that more [...] especially to the client [...] it would be more expensive but it's much more sustainable...*
np2	*...look after the interest of the client try to keep the project as close to the client's budget as possible [...] getting the best contractor possible for the job [...] measuring, costing, get the latest rates, most update figures...*	*...not ripped people off [...] pricing being fair [...] fair competition. Just being honest [...] good fair business [...] modern slavery [...] company has a moral responsibility to make sure that that doesn't happen.*	*I think so because we're the part that says, often would say that sustainable solutions can be sometimes more expensive solutions and therefore, QS is probably say no to it more than they should.*
np3	*I'm an assistant cost manager [...] assisting whatever where I can [...] been working with them (clients) for two months it's an element of trust [...] of being vigil. I've done module on professional ethics all that client stuff. I wouldn't put my hand to do something forbidden that had serious implication...*	*...up to date, to understand the obligations at the end of the day the QS has got a number of decision making to make [...] if something goes wrong [...] it's very, very, very important that as professional we take it seriously on what we're learning and apply it.*	*I believe they do [...] in my firm the real push is from corporate social responsibility [...] in the office [...] in the construction site as well you wanna be the kind of company that is doing good as well in all kind of things including in the project that we're doing.*
np8	*Probably just the qualities [...] hardworking [...] research behind all the cost that's given to me. I network with other people to ensure that I am getting the correct figures as determine.*	-	*Not directly but indirectly yes [...] assisting with the design [...] help decide on cost so if the sustainable method is more cost efficient then we will be able to help with that [...] we don't really have any direct involvement...*
np5	*Graduate surveyor spread across a few different phases at the moment [...] works hard and lack certain technical understanding at the moment which I think will just come [...]*	*...not taking bribe [...] accept gift that could be construed as bribes [...] at the moment I'm placing a brickwork package and we've always decided who we're using already but we need*	*To an extent. There are certain aspects that we can't get involve with like the technical side of things we can't ask them to change the materials been used [...] we can hire good*

	someone you could do the job but not as well as the other surveyors at the moment because they're well in their careers...	*two other quoted price to compare to [...] choosing two other firms just for pricing exercise with no actual chance of they gonna get the job [...] that feels a bit morally not on.*	*subcontractor […] that's one of the things that we can get involve making sure that the building process while it's happening is good...*
np6	*Only done it for a year so not got like specialist area yet. Human characteristic [...] enjoyed working with numbers now more than before [...] enjoyed knowing how much money is worth [...] QS obviously a good problem solver[...] think outside the box to answer question the client might ask [...] we are problem solvers in terms of specifically money.*	*...the RICS has quite hard on that […] don't take bribe […] if a QS who works on public project I think the moral duty is to make sure that money is going to value [...] that money might be drawn from national fund or tax payers [...] being more human like being the best to the client [...] acting in a way that doesn't hinder others […] working in a team environment [...] just uphold any value to human act...*	*We don't design the sustainability elements, we don't really do too much of criteria that meet BREEAM standards etc. […] that a lot like design. Morally within the team, you encourage [...] we can say we know green wall can be built with this price and well within your budget [...] that will help meet your sustainability target […] but also if it's not in the design, it's not us who then put it in [...] kind of rely on it being in there in the first place.*
np7	*...deal with the numbers [...] to have knowledge about everything [...] understand the whole building in a whole and I don't think a lot of other professions actually do, do that [...] my goal personally [...] to put QS up there I don't feel like we get enough acknowledgment [...] QS understand more than architect because we have looked up around the whole life cycle approach.*	*I think the best interest of the client but also being ethical around really so I was employed by the client and just act on what we think to be the best for them and also making sure nothing outside the project influences our decision in summary.*	*I feel one of the job of QSs are also critic what has been proposed why don't we do this [...] propose we did this on this job why don't we try here […] we're very much involve with a higher spectrum of project and with that comes more knowledge in terms of what the buildings are doing in terms of sustainability [...] I feel like they do have a role in pushing sustainability agenda.*
np4	*A lot of the time I'd say I'm on the client's side PQS […] I'm a QS work on behalf of a client [...] their representative going into meeting and I'm the face of it I suppose when dealing with project managers and engineers and architects and people like that […] I'm the person between the project and the business because both sides come to me.*	*...not just given a job to a friend or things like [...] have to be really strict to yourself [...] tough discipline and just not put yourself in any position where you could be seen to be doing something that might be not necessarily correct.*	*…QS's opinion would probably think that the client just want the cheapest thing but I think to give the options is definitely our responsibility [...] you can explain it we might not be the lowest cost but look what you gain back [...] I think they (QSs) definitely got a massive responsibility [...] might not be mine just yet.*
np10	*I'm professional […] attended the RICS event, the code of conduct that they held every year […] what's changed and what's new how to follow it where to find it the reason behind it...*	*The RICS set out the ethical guide my company also have their own ethics that we have to go over every year [...] Essentially we have responsibility to the client which is high level of responsibility for their service to the client […] we have system in place to prevent bribing...*	*To advice the clients [...] if the client can't afford […] almost spark up the interest of the client [...] sustainability is important but very tightly link to the work of the architects and the engineers [...] We can offer only through cost plan [...] give them a list of items that at the end of it quoted on how they can save money [...] not our ultimate role, at least the lead consultant [...] if the client wants to be achieve*

			that BREEAM rating then we would obviously do more to help but it will depends on what the client wants.
np9	*Commercial team [...] profitability of the company; A lot of contract administration [...] my day to day works [...] contract law and practice. Main priority is to minimise risk and cost of the project and be able to achieve the target margin and maintain you got to get maintain the profitability of the project.*	*...the RICS organisation [...] open and honest, integrity and professional manner, treat people with respect always provided high quality of service [...] that is definitely a profession [...] you need to behave in order to promote yourself and your company and been able to build a reputation that would be appreciated by the client then they will be more willing and open to give you more work.*	*It depends [...] tenders for example ... to implement like sustainability 10% [...] as a QS you got a responsibility [...] part of your deliverable[...] what happens is for example the waste management [...] usually looked after by the operational staff / the site manager and it's their responsibility [...] that's where it diminish the sustainability element for myself working in rail [...] completely different to if you work on a housing estate [...] I haven't got that experience.*

i. Inclination towards sustainability

Table 6.1 illustrated that although these NPs were still finding their feet and identity in the profession, and their role as QS, most of them believed that QSs have roles and responsibilities towards sustainability. Those responsibilities are mostly associated with the profession, especially in terms of giving advice, options and recommendations specifically in relation to cost-related factors as illustrated in Table 6.1 and several quotes below:

> *...fundamentally we do cost construction we know what is more sustainable what isn't [...] it would be more expensive but it's much more sustainable...* (***np1***)

> *I think to give the options is definitely our responsibility [...] you can explain it might not be the lowest cost but look what you gain back...* (***np4***)

> *Morally within the team, you encourage [...] we can say we know green wall can be built with this price and well within your budget...* (***np6***)

> *...help decide on cost so if the sustainable method is more cost efficient then we will be able to help with that...* (***np8***)

If the client can't afford [...] almost spark up the interest of the client [...] we can offer only through cost plan [...] give them a list of items that at the end of it quoted on how they can save money... (***np10***)

ii. Contrasting opinions

Even though Participants ***np6***, ***np8*** and ***np10*** in point (i) above stated that a QS could help with sustainability by offering advice, options and recommendation from cost-related aspects, these three had contrasting opinions in terms of the QS's role and responsibilities in relation to sustainability:

We don't design the sustainability elements [...] if it's not in the design, it's not us who then put it in [...] kind of rely on it being in there in the first place. (***np6***)

Not directly but indirectly yes [...] assisting with the design [...] we don't really have any direct involvement... (***np8***)

...sustainability is important but very tightly link to the work of the architects and the engineers [...] not our ultimate role [...] it will depends on what the client wants. (***np10***)

Why do they have differing opinions on the same matter? In addition, the majority of CQSs also have similar differing opinions on this same matter (see Table 6.2) but with less enthusiasm. From the three quotations above, it seemed that the QSs could offer help with sustainability (by giving advice, options and recommendations) if it was part of their job's requirements as discussed in Section 5.4 as opposed to motivated by their own values and initiative.

iii. Cost issues

Apart from these three NPs, another NP had a fascinating opinion with regards to a QS's role and responsibility towards sustainability by saying:

> *...because we're the part that says, often would say that sustainable solutions can be sometimes more expensive solutions and therefore, QS is probably say no to it more than they should.* (***np2***)

What does this mean? How did he/she come to that conclusion? Since the participant mentioned it, then it means that it has happened. It is not because the client rejected sustainability, but it was the QSs themselves who dismissed the adoption of sustainability due to higher costs. A study by Oladotun and Edosa (2016) discovered that QSs agreed with client service delivery as the first ethical standard that construction professionals should consider when performing their professional obligations in order to avoid project failure and cost overruns. Is this what happened? Is this an example of short-term consideration on the part of QS as a client's cost consultant?

6.5 Chartered Quantity Surveyors (CQSs)

The discussion in Section 4.5 showed that the CQSs had a definite conception of themselves as QS and linked it to their profession, professional roles, and their values and attributes. On the other hand, Section 5.3.2 discussed the CQS's work involvement with sustainability and, from the discussion, it was apparent that most of them did get involved with sustainability elements in their work. Table 6.2 shows the CQSs' descriptions of their PI and their perceptions of the QS moral and ethical responsibilities and as well as the roles and responsibilities in relation to sustainability.

Table 6.2 CQSs' perceptions on their PI, QS moral and ethical responsibilities, and QSs roles and responsibilities for sustainability

	PI descriptions	QS moral and ethical responsibilities	QS sustainability roles and responsibilities
p10	*I think I'm quite different to other QSs. Although I'm a trained QS and could do the pure QS role but I'm also project manager, contract administrator and I do all those sorts of roles as well. I'm a jack of all trades I would say is my role.*	*It's keeping a client informed and making them aware of everything in a project.* Looking after client's interest.	*If you do life cycle costing exercise for a client [...] extra cost [...] they don't always want that [...] all about giving options as a QS [...] have separate line items and says if you went for this it's gonna be a certain uplift, improve the sustainability and the same with material choices [...] if you had experience then you should speak to the architect and say that's actually gonna be a cost saving and environmental friendly product [...] feeding that back and to improve sustainability. It easier said than done anyway.*
p6	*I'm a chartered QS by a background [...] I've moved into delivering project management and I've also in that specific of time delivering programme management as employer's agent role [...] I spent some of my time split between traditional QSing, project management and also which is linked but slightly separate managing the business itself.*	*...acting impartially and openly and honestly [...] obviously generally speaking we're talking about money and so lots of it refers back to money and I think for me is about just, I have no self-interest. Obviously I want to get paid my fees for delivering a service. I want to deliver as best of value project as possible for a client [...] to provide fairness to everyone from financial perspective...*	*...challenges for a QS is that if a project is going over budget [...] cost pressure is accounted in the project [...]If you got a specific requirement [...] planning condition [...] the responsibility on the whole team is very clear [...] As a QS, we won't design the building, we have views on good systems and options for sustainability measures, and whether or not the cost are significant or less significant [...] the benefits of those measures are in terms of operational cost [...] life-cycle costing on project [...] We're not the main influencer, for me I think that is still for an architect to lead consultants as the main consultant [...] it's more likely to find its way in a project.*
p9	*Trustworthy, honest, fair, reasonable, can relate to people, can respect other people's roles and give them their autonomy because they are also project management company [...] I sometimes act as a project manager [...] benchmark of cost data that we can provide information for the whole project [...] see as important member of the team that people like to work*	*Being part of the RICS [...] basis for that sort of rules of conduct and code of conduct and ethics, and I think that's important [...] underpins the accuracy, and the belief that the client will have on that consistent advice so without that, you might be accurate, but you wouldn't have that underpinning you [...] being honest, fair, reliable, trustworthy; all of the things that I think it goes together.*	*Yes, I do but you wouldn't be designing something would you? You would be proposing something [...] the second in the chain of shall we have it or not have it [...] not just kicking out because it's more expensive capital cost [...] responsibility to accept and embrace sustainable solutions [...] if you are happen to be the lead consultant [...] ask those questions of a client.*

	with. Important that the client respect what you are doing.		
p8	*...I don't think the title actually describe what we really do very accurately [...] our role in procurement is probably the most important in what we do [...] I don't think people aware really of the kind of what goes into making things, making sure things are procured fairly.*	*To be fair and reasonable and that's from all sides[...] the contractor [...] the client [...] designers […] I think we have got to have a highest level of moral and ethics. It is key for us because I think we are […] policemen, to be fair and reasonable to all.*	*Yes […] clients aren't always aware of the options [...] quite hard to find cost data and to get quotes [...] you can only consider options if you know the cost of it […] there's so many options now [...] the best one for the environment maybe not the best one for the client [...] giving them options at least.*
p7	*...I am a quantity surveyor and I am a member of the RICS [...] I'm a QS, that's it. I don't feel I need to be call the cost manager or given some other strange title or reinvent myself in any way.*	*...as part of the member of the Institute of Chartered Surveyors, we have an important role to uphold things like fairness and honesty [...] the code of conduct [...] treating people as we want to be treated ourselves and respecting everybody [...] we could possibly be discipline or even thrown out, and that would have a reputation-damaging effect.*	*Yes and no [...] we respond to the specification […] that's driven by the designers and their respond to the regulations [...] we do a lot of value engineering [...] aware of technologies and how can we help to meet the regulations at the cost [...] predominantly the designers' role but we need to be in there with a bit of lateral thinking, asking questions and making suggestions.*
p1	*I think it sort of outstanding member of the community, somebody you could discuss your issues with [...] about a project or something, a listener [...] offer a value judgement. Independents [...] very strong thing [...] private practice particularly, offer independent view [...] help, an ear to turn to.*	*...a moral side of it in terms of looking after your client's interests [...] his financial matters with the best interest at heart [...] making it clear where you stand. Avoiding corruption is a big issue [...] making sure that you don't fall foul of any regulations of the RICS, legal responsibilities...*	*All professionals do [...] offer client views on things [...] not just about the cost of buying them, it's the cost of running them and the durability [...] life cycle costing […] I don't think clients are asking for at the moment [...] because the QS is not been ask to do it and they don't do it they got paid to do it.*
p5	*How do you describe that differently from my role? What would you define the difference between my role and my identity? I'm very clear on that (my role). In a nutshell, it is to deliver financial certainty and financial control within the construction.*	*...act for the contract, who is paying your fees. So pre-contract [...] before you enter into a contract with the contractor [...] to tell the truth and not be bullied by client [...] the role is to effectively mediate fairly between the client on the one hand and the contractor on the other. But you're bound by a set of guidelines and rules which are set out for the contract so your job is to fairly administer those rules engagement.*	*...we obviously, we will input to say, we did this over here on this project why don't we do that instead of this. But on us, I don't think it's a lead profession in terms of sustainability. I think we can enable it but I don't think it is, our training isn't designed I think, maybe should be but we're not trained to say why we're using that brick rather than that brick. We rely on the designers to be innovating in that area and we support them in terms of saying "okay, if we did that, and this is the cost impact".*
p3	*I'm a professional man, I'm a businessman, I provided professional service. I like to think I'm user friendly, honest. My job is to tell the truth ... not to disseminate information for a client or to a client because it*	*Brutal honesty. I will say the unsayable and we have to, because that is what we've been paid to do. Look them straight in the eyes and tell the bad news. They don't like it. You can't do anything about it but you are*	*It has to make it work [...] credible [...] getting a return p...] not my job to tell the client what he can't do. It's his money [...] client to make a positive decision [...] my role is to giving the information.*

	suits that client. My job is very clear [...] tell the truth because if I don't he can get suffered and I can get sued.	*paid to be clear because if you are not clear, someone might make a decision to do something which is not to their advantage.*	
p2	*Professional who provides both financial and contractual advice throughout the whole construction process both pre-contract, installation process and the life-cycle estate management phase [...] It ranges from financial planners, financial managers and contractual contract services advisor.*	*...the RICS code of conduct [...] also dictated in by legislation [...] to ensure that the client is carefully informed as far as possible [...] the information provided is both accurate and seek to advise the employer in the most practical way [...] the QS has got the major role because it's the money and the money is the principal and guiding in terms of the overall process...*	*Responsibility [...] particularly where contracts and the employer require sustainability to be a key consideration [...] public contracts [...] obligation of a QS to seek to make sure that all elements of the project do their best to design the best to lip service.*
p4	*I set myself as a professional chartered QS with the qualification, and I belief that I'm making a reliable contribution to the work that I do.*	*Well presumably RICS, we have standards to work to ... the role of what we do is usually one of neutrality and try to be fair and that's an obligation that place upon us in some form of contract. If you are a contract administrator so often my advice to perspective client is I will tell you honestly what I belief even it's not necessarily what you want to hear. That's your responsibility.*	*I haven't thought that [...] we're often driven by the client's needs. As a QS [...] difficult [...] more in the hands of a designer [...] design using sustainable materials where QS is not normally involved [...] reasoning of the cost effect on that. Directly, I don't think we're having a direct effect.*

Based on Table 6.2, it is apparent on the similarity between CQSs' descriptions of their PI and their roles and responsibilities towards sustainability. The similarity is of their esoteric professional services which are as a financial and contract advisor (Oladotun and Edosa, 2016; Fong and Choi, 2009).

However, it is also noticeable from their descriptions that the QS roles and responsibilities towards sustainability are more to do with fulfilling obligations rather than coming from their own initiatives and motivations to protect the environment. None of the CQS participants mentioned sustainability when describing QS moral and ethical responsibilities. What does this mean? How is this reflected on those who are relatively optimistic like NSs, FYSs, and NPs (as illustrated in Section 6.2, 6.3.1, and 6.4.3)? Is this a tempering of youthful enthusiasm by realism? Whereby, by the time they graduate and get the job, realise what the job is, and finally

get into a position of influence; the responsibilities and burdens are such that they cannot seem to change. Alternatively, is it justified for them to pass the responsibility to others (client and designers) and maintaining a short-term, client-oriented focus as illustrated below:

> *I haven't thought that, haven't thought so (QSs roles and responsibilities towards sustainability) because we're often driven by the client's needs.* (***p4***)

In addition, eight of the CQSs stated that sustainability in a construction project is either requested by clients or requirement of legislation (e.g. regulations and planning conditions). Hence, sustainability becomes part of their responsibility to provide the best service that they can to both fulfil/satisfy the client and legislation requirements. As their sustainability commitment would be based on their obligation rather than coming from their personal or professional capacities, therefore, the commitment would seem more as a reason to promote or defend their interests, and less as a normative action. However, there are also advantages to this obligatory responsibility where the commitment makes the QS professionals consider something that is outside of their domain of expertise. Is change then enacted through legislation? Is this the best that QS professionals can offer? If this is the case, then what is the value of the profession to society?

i. Cost issues

A QS is an individual who operates in the best interests of his/her client or employer and which is often related to discourses of cost efficiency and profitability as illustrated by the quotation below:

> *...obviously, the QS has got the major role because it's the money, and the money is the principal and guiding in terms of the overall process.* (***p2***)

From this statement, the importance of the financial aspects of a construction project is apparent. As a cost advisor for a project, the QS has to make sure that their clients receive the best value for their money. Therefore, as incorporating sustainability measures into a project would mean an extra cost to the client, then they might not want to do it as illustrated below:

> *...one of the challenges for a QS is that if a project is going over budget for any reason, and cost pressure is accounted in the project...* (***p6***)

> *The reality is that most of the time, something that is sustainable caused money and therefore, it can going back to my analogy: the public sector is affordability, and the private sector is erosion of profit. So how often do you find people doing more than legislation demands them to do? The answer is not many [...] because there won't be competitive otherwise.* (***p5***)

Higher capital cost and a lack of awareness of market value are significant barriers to the implementation of, and demand for, sustainable construction (Zhou and Lowe, 2003). Therefore, due to investment issues, most clients and developers are encouraged to consider short-term financial returns rather than long-term consequences of their actions.

ii. Based on the client's willingness

This was a similar opinion to that of Participant ***p5*** from participants ***p3*** and ***p10***, who asserted that ultimately it is the client who will make a decision as illustrated by a quotation below:

> *...if you do the life cycle costing exercise for a client and extra cost and they don't always want that extra cost...* (***p10***)

The decision was usually based on the client's willingness to pay for the increased capital cost (Dewick and Miozzo, 2002) as they had to pay the full cost of the environmental effects of their buildings (Bon and Hutchinson, 2000). As advisors, all the QS can do is to try to provide

their client with as much information as possible to enable the client to make informed decisions. However, the CQSs' responses did not provide detailed descriptions as to the kind of information they provide to the client. It might be that "this is the minimum requirements that you have to do to comply". Moreover, as shown in Table 6.2, the majority of CQSs specifically mentioned that the client is part of a QS's moral and ethical responsibilities. In this instance, whatever the decision is going to be, it will ultimately be based on what their client's wants and needs.

ii. Designers' roles and responsibilities

Apart from the cost-related issue, five of CQSs believed that incorporating sustainability into a construction project is more in the hands of the designers (i.e. architects and engineers' roles and responsibilities) as illustrated below:

> *...it's more in the hands of a designer who would be able to design using sustainable materials. A QS is not normally involved in the selection of materials so that's the designer's more although the QS might be in reasoning of the cost effect...* (***p4***)

> *...our training isn't designed I think, maybe should be but we're not trained to say why we're using that brick rather than that brick. We rely on the designers to be innovating in that area and we support them in terms of saying "okay, if we did that and this is the cost impact".* (***p5***)

These two quotations aligned with a study by Hardie et al. (2005) which revealed that QSs generally believe that it is the design consultants who drive innovation in construction projects and thus perceive themselves to be supporters of innovation and contributors to a team but not usually leaders of that team.

iii. Business-related

Some of the CQSs were very business focused as they were also part of the management team in their firm or company. This means that, apart from their role as a QS, a number of them also played the role as a director and partner at the company as illustrated in Table 6.2 under PI descriptions' column. Thus, there is a need for them to balance sustainability against their client's interest and requirements with competing demands such as economic growth and business profitability (i.e. their interest). This condition was particularly the case as most of them (practitioners) work as consultants. In this instance, since there are issues of uncertainty and lack of information (e.g. cost data) regarding sustainability, these professionals' value judgement might be based on precautionary principles.

> *...you can only consider options if you know the cost of it... **(p8)***

In this respect, they will not provide advice on something of which they are not sure of the impact. They needed to maintain and promote their reputation as the best financial and contract advisor to current and potential clients as their delivery success depends on their ability to satisfy and meet their clients' needs and objectives (Chong et al., 2012; Mbachu and Nkado, 2006). Clients' satisfaction will add value to the firm or organisation including the development of a client's loyalty, the creation of positive word-of-mouth recommendations and as a measure of market performance (Mbachu and Nkado, 2006).

Therefore, cost issues, focusing on the client's interest, uncertainty and lack of information, and business focus might limit any sustainability values and attitudes that these professionals may have in them. However, from their interview responses, it was quite hard to determine if they have these attributes or not as they were not visible. Moreover, none of them mentioned sustainability as part of QS moral and ethical responsibilities and sustainability as part of the

changes that they would like to see happening in the construction industry in the future. Sustainability enactment by CQSs were mostly based on the job's requirement (i.e. the client want it, or it is mandatory). Is this the best QS professionals can offer? They seemed quite comfortable to admit that they are not the leading influencer in terms of sustainability. Moreover, they see it as the client's and the designers' responsibility. This assertion aligned with the findings made by Koigi (2017) where QSs believed that they generally have little influence towards green building specifications as the client and architect have the final say on what would be incorporated into a building.

They described their role as providing options and recommendations specifically in relation to cost effects. There are however, issues with this type of role as there are not enough cost data available. Therefore, it is quite difficult for the QSs to present options or to provide recommendations. Due to lack of information, it is difficult for QSs to analyse the LCC analysis that can show a likely return from the client's investment. Sustainability adoption has to work and be credible with substantive evidence in order for a QS to convince their client. As asserted by Koigi (2017) QSs with experience in sustainable building projects were more likely to contribute towards sustainability due to lessons learnt and knowledge from previous projects. Otherwise, it would be difficult for them to convince others (client, designers) and so they may consequently cease trying.

6.6 Summary of the Tensions Exist across the Different Snapshots of the Journey

Figure 6.2 represents a summary of the discussion regarding the associated tensions in the enactment of sustainability both in the context of education and as well as practice or work. More details illustration particularly on FYSs, NPs and CQSs are presented in Appendix G. The middle arrow represents the emergence of PI that is getting more defined as they progressed from the NSs to the CQSs (as discussed in Chapter 4). The smaller arrows on the right side indicate the QSs' sustainability involvement and perceived roles and responsibilities, i.e. views for the greater good; in relation to sustainability. The small arrows on the left side indicate the tensions (the short-term perspectives) or perceived barriers to the enactment of sustainability by the QSs.

The new students (from exposure to sustainability before formal professional education) were aware of the importance of sustainability, and three of them showed enthusiasm and optimism towards it. Is this a sign of changing times where this inexperienced ingredient in this educational process has the potential to develop into a version of QSs who refuse to agree with the statement that sustainability is the client and designers' responsibility?

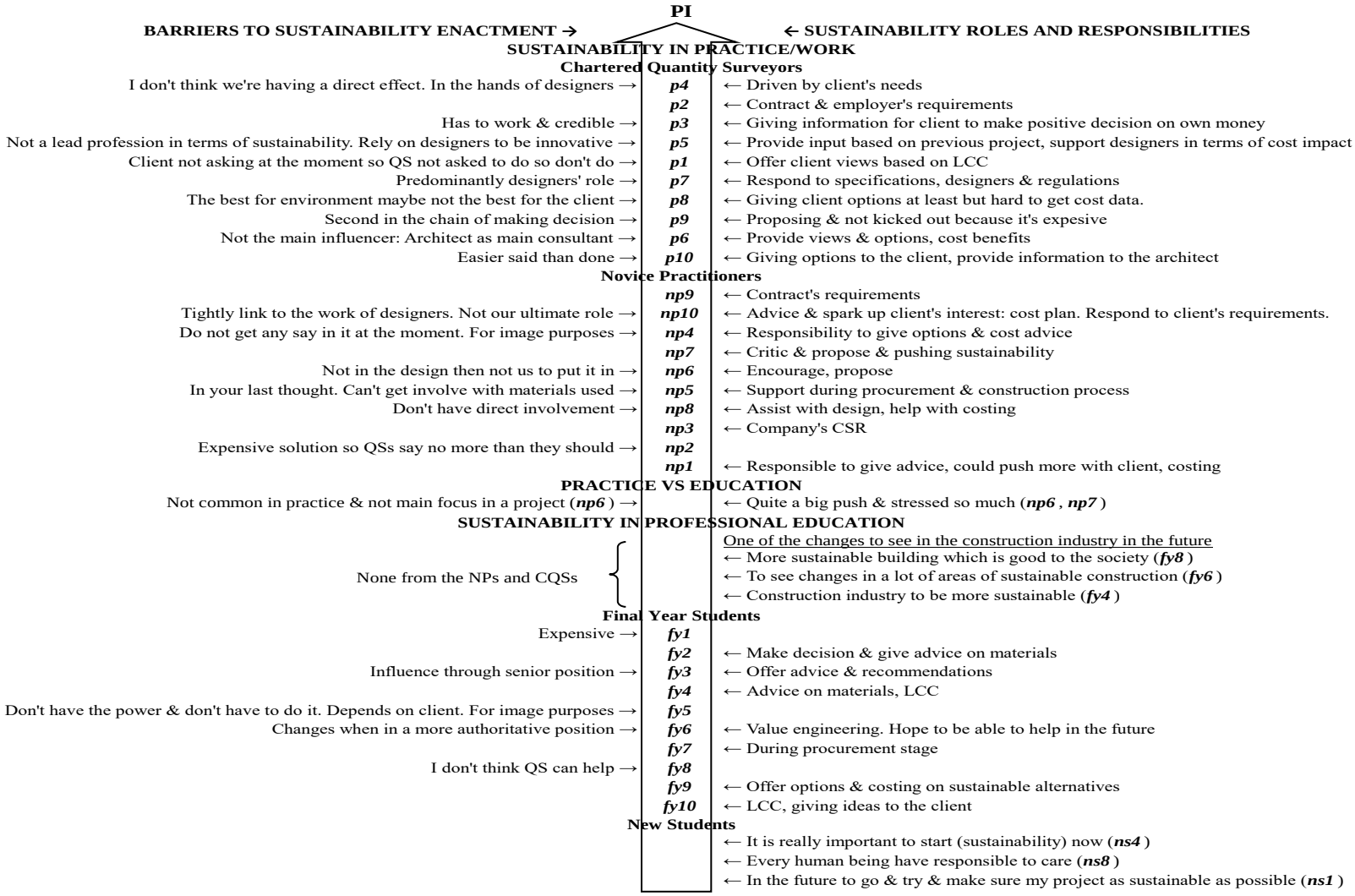

Figure 6.2 Summary of associated tensions from the four different snapshots of the journey

As for the final year students, as illustrated in Figure 6.2 and 6.3, their responses showed some differing opinions. Even though most of them believed that the QSs have roles and responsibilities towards sustainability (a sign of optimism), some of them, however, had contrasting opinions. In this regard, two showed a tendency towards client-focused, which can lead to the offer of short-term options, particularly in relation to cost-related aspects, and the implementation of sustainability that is purposefully for image and marketing.

When opting for sustainable solutions could impose an addition to the capital cost, a client with a rigid or limited budget may not want to consider them. Also, some client would only want to adopt sustainability for image or marketing purposes. In this case, sustainability implementation would also be minimal. Therefore, for QSs who are more client-oriented (e.g. to please or retain the client), they would follow their client's requests. In addition, three of the FYSs said that QSs could not help as they are not involved in the design, thus do not make decisions in relation to construction methods and materials. Another one stated that QSs do not have the power to influence and moreover, they do not have to do it. Is this a sign of the start of the erosion of sustainability?

One FYS and two NPs said that they learnt a considerable amount of information about sustainability in their degree programme. Due to the exposure, one NP sounded slightly disappointed when, on starting work, they found that sustainability is not a common practice in the industry. How does this reflect on education? Students might say that their degree was not worthy since they cannot use what they had learned. Nevertheless, as the NPs had been exposed to work on a daily basis, they understood more about how QSs can contribute towards sustainability. Their responses are illustrated in Figure 6.2 and 6.4 which suggest that the NPs are relatively optimistic.

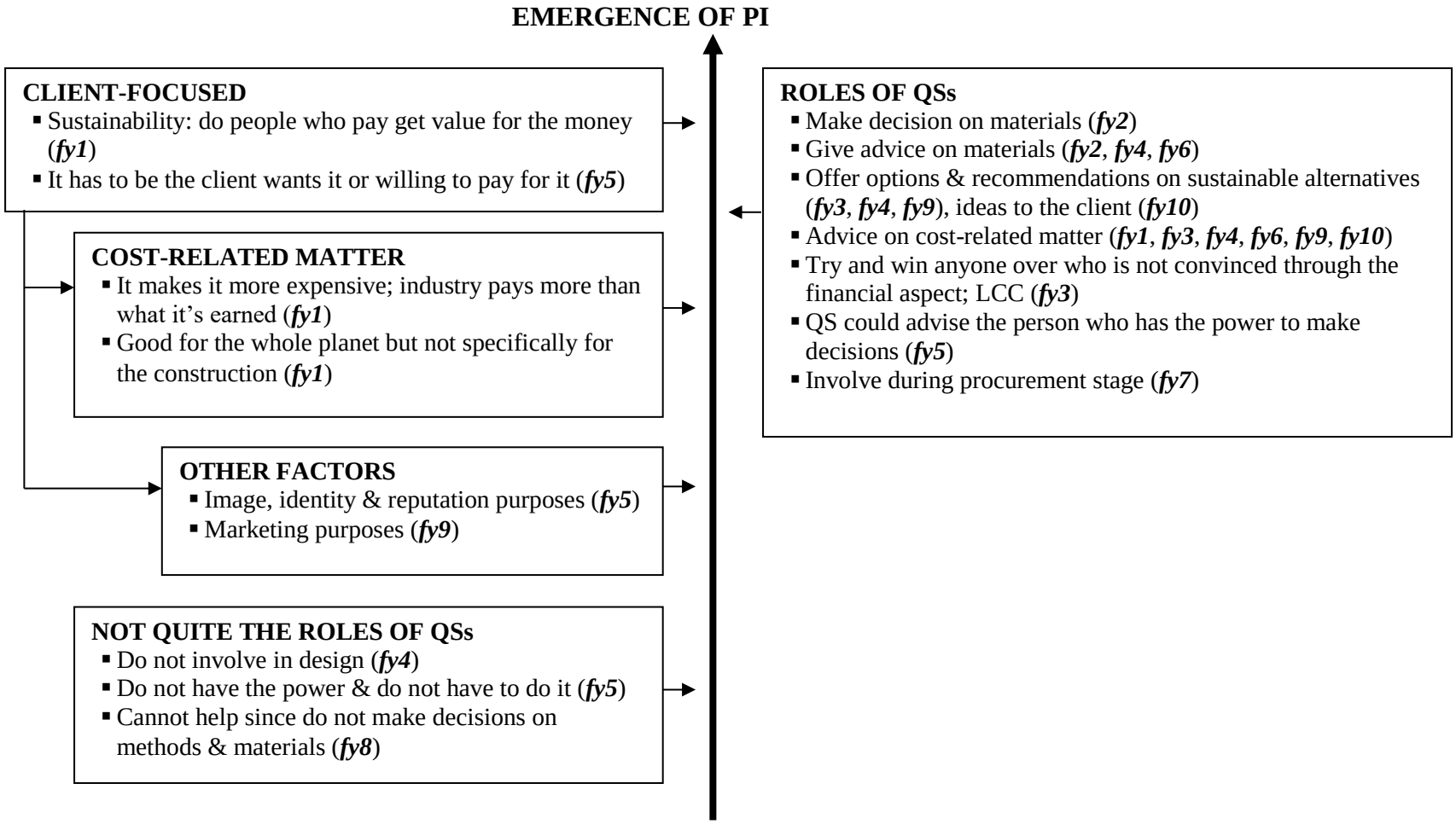

Figure 6.3 Associated tensions that exist from the FYSs

However, at the same time they realise the limitation of QSs' involvement and the level of influence on sustainability in a construction project. Due to these matters, QSs are relying on the client, designers and regulation to implement elements of sustainability in a project and their role, therefore, would be to fulfil the job's requirements. In this regard, one example of optimism from the NPs was as illustrated:

> *It's so relying on it being there for us to get involves which maybe there needs to be a way that I can change maybe that the way to move forward where it doesn't have to be so relying on the design for sustainability.* (***np6***)

As for the short-term perspective, the NPs' responses were similar to the FYSs, i.e. client-focused but more concerned with cost-related aspects. As a cost consultant, it would be obvious that they would be more concern about the project's cost and make sure that their clients will receive value-for-money. This is probably why two NPs said that the QSs would help decide on cost if the sustainable method is more cost efficient but the QSs appeared to reject expensive sustainable solutions more than they should. These two NPs must have gotten the impressions based on their observation or direct involvement through their work. There would be a risk that the early careers might conform to this practice that put the cost as a priority and consider sustainability as not that important. If these NPs are the potential agent of change for future adoption of sustainability, the act of conforming to the current practice might deter their move for change.

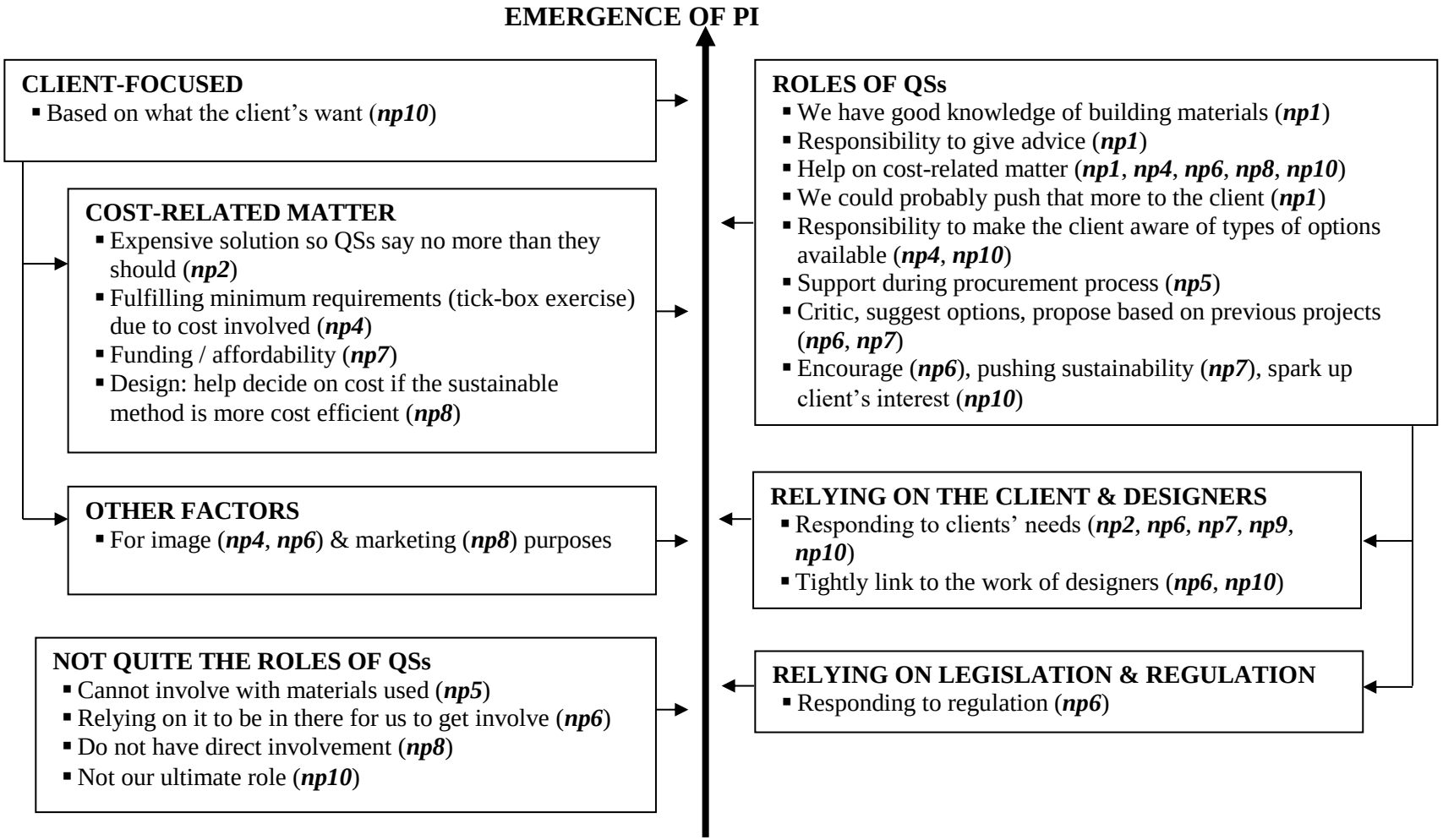

Figure 6.4 Associated tensions that exist from the NPs

As shown in Figure 6.2 and 6.5, the limitations and level of influence are more perceptible as practitioners gained more experience with their work and roles. The CQSs are in a position where they can exert influence in their work. As previously discussed, two FYSs and one NP have this notion that changes, and influence can only be made to happen if a person is in a senior or authoritative position. Now that these CQSs are in that position, they still depend on the client, designers and legislation to drive sustainability in a project. Why? They play a key role in a construction project and the project's design team (Section 2.9), yet they comfortably pass the responsibility for championing sustainability to others. They were also comfortable with not being the main influencer but acting as a support system to the designers by providing options and recommendations. Is this the best that they can offer? They may perceive sustainability as an area that is outside of their role; a perception that seems unproblematic for them. Whatever 'logic' that they were using (rationale, self-explanation) to justify what is, in fact, a short-term solution, satisfying the client over the longer-term and greater good to society comes through time and time again. They were comfortable to say that they are not the main influencer in terms of sustainability, even though they are part of the key members of the design team.

They describe one of their roles and responsibility towards sustainability was to provide options. What kind of options will they offer? Are they holding a passive role when it ends up being part of a project? This outline shows that they have a role and an influence on sustainability, yet this participant has a different perception:

> *I don't think we're having a direct effect.* (***p4***)

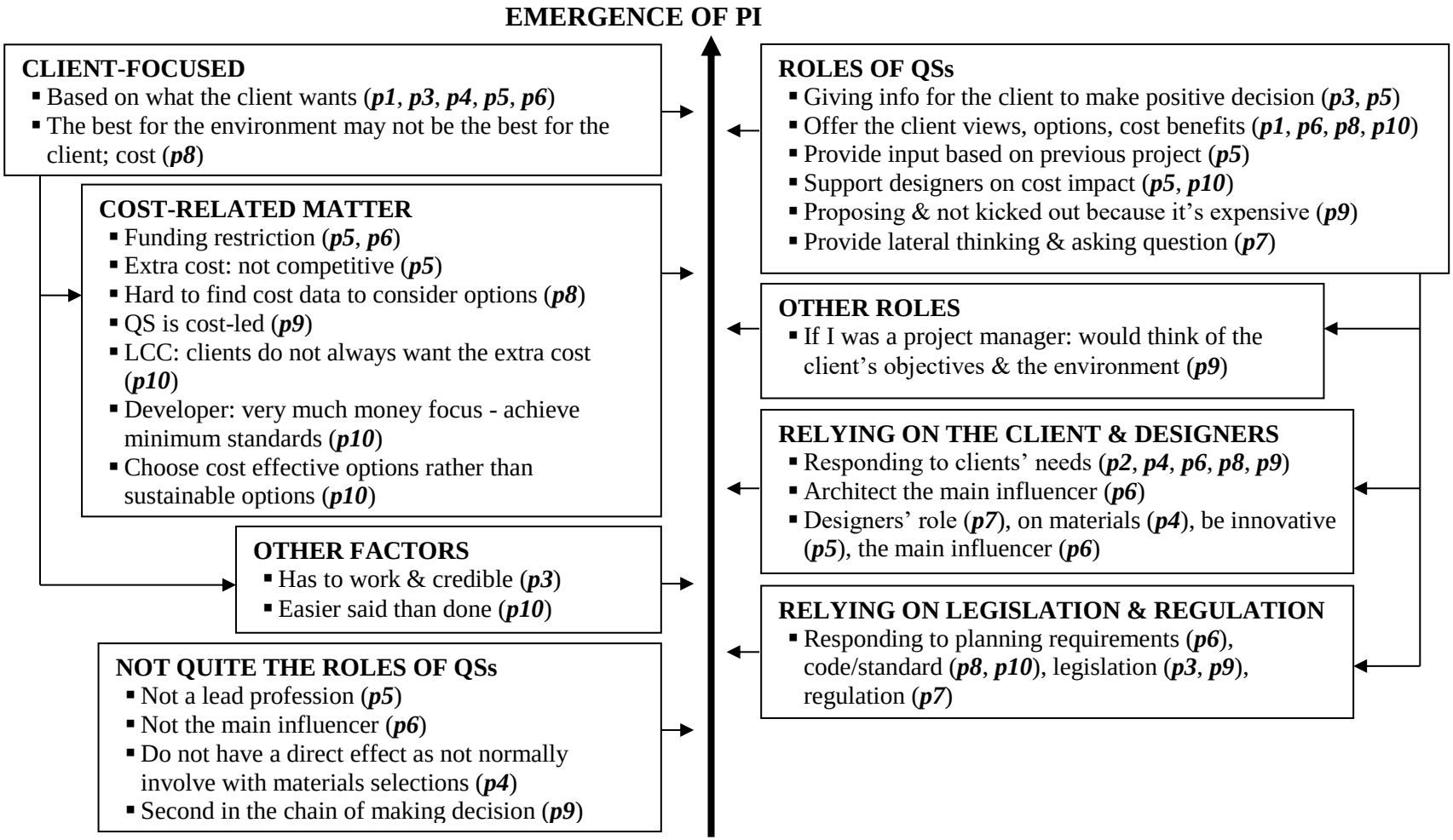

Figure 6.5 Associated tensions that exist from the CQSs

Why are they not being proactive? One reason would be the difficulty in obtaining cost data in order to consider the options as asserted by Participant ***p8***. This reason might be why they would instead rely on the designers or regulations to include sustainability as part of a project as it would be difficult to convince others when they do not have data to back it up. As quoted by this participant:

> *...as a QS [...] if you do suggest and it's wrong then you gonna get sued and you gonna be in trouble. That's why I think some QSs will probably just keep shut and just did their job really and not goes beyond what they are meant to be doing. But I think there's definitely scope for suggestion...* (***p10***)

What is stated in the quotation is probably why the QSs do not consider themselves as the main influencer of sustainability.

In this research, the QSs seemed to be disconnected from one of the values of the profession which is to act in the interest of the broader society. Due to this reason, they might consequently build their own 'professional culture' that is informed by their subjective personal experiences and interests. They would comfortably choose to serve only their clients (half of them are client oriented as illustrated in Table 6.5) as opposed to the broader society as they would consider it to be more convenient. Convenient in a sense that, as quoted by Participant ***p10*** above, just to do the job and not go beyond what is required by their client, i.e. to satisfy the client. This orientation perceived by the professionals as not bad if they do not do it (adopting sustainable solutions) as quoted below:

> *I don't think clients are asking for at the moment [...] because the QS is not been ask to do it and they don't do it. They got paid to do it.* (***p1***)

This statement is another indicator of their inactive involvement with regards to sustainability. They may perceive their job is limited to doing what they were asked to do and nothing more.

The CQSs were clear about their roles and responsibilities. However, what was lacking in their (and NPs') descriptions of PI and roles and responsibilities towards sustainability was the belief in public service. This attribute of a professional was also not apparent in their (and NPs') descriptions of QSs' moral and ethical responsibility. Is this the reason why they only consider sustainability as part of the job and not something that should come from their dedication and commitment to the essential values of their profession? If this is the case and if this is going to continue, then any enthusiasm and optimism regarding sustainability that the students and novice practitioners have might diminish once they started work and eventually conformed to this existing culture and tradition.

6.7 Conclusion

The chapter is highlighting that, despite the tensions and barriers to the enactment of sustainability, there is no indication of conflicts with the participants' values and beliefs. The participants believed that they had successfully delivered their obligations accordingly. Their responses illustrated that they have the personal dedication and lifelong commitment to their profession, particularly among the CQSs (a sense of calling; an attitudinal attribute of professions). In addition, they also showed pride in their profession, and this is also visible from a number of FYSs and NPs. However, what is lacking in terms of their PI and professionalism is a belief in public service as previously discussed. In this regard, the current and future QSs must understand the essential function of their profession and why it exists. If they are aware of the fact that they are in this situation with these tensions, this awareness might help lead to different decisions being made in the future. As some of the NSs, FYSs and NPs showed

optimism and enthusiasm towards sustainability; this can be further developed along with their PI. PI would make individuals identify with the values of their profession. Therefore, they may consequently develop strong positive attitudes towards sustainability and be the agents of change and champion of sustainability that would bring more benefits not just to the client but to the public at large.

Chapter 7: Conclusion

7.1 Introduction

This research has investigated the formation and development of professional identity (PI) and attitudes towards sustainability and also on issues or tensions in the perceptions and enactment of sustainability pertaining to current and future QS professionals. It draws on their experiences in four different snapshots throughout the journey from being new students to those practising as chartered professionals and what happened at the specific points in time. This chapter draws on the findings and discusses their implications. The chapter begins with a review of the research aims and methods used to investigate the seven research questions. The summary of the major of the findings is then presented based on the seven research questions. It also presents the contributions of the current research to knowledge, alongside the implications of the experiences of the participants regarding the emergence of their PI. Similarly, their attitudes towards sustainability and how these findings may be more broadly applied are also explained. Limitations of the study and recommendations for further research opportunities generated from the findings of this thesis are then presented in areas where this present study hopes to offer useful insights that could contribute towards the establishment of more sustainability practices within the built environment (BE) sector.

7.2 Review of Research Aim and Method for Achieving Research Objectives

This research aims to examine the interplay between the emergence of PI and attitudes towards sustainability among the selected BE current and future professionals based on their educational, and their practice or work experiences. Three primary objectives were identified as follows: (1) to explore the formation and development of PI during formal professional

education and practice or work, perceptions of PI and influencing factors, (2) to explore the formation and development of attitudes towards sustainability during formal professional education and practice or work, perceptions about sustainability and influencing factors, and (3) to investigate the interplay, if any, between emerging PI and attitudes towards sustainability.

In order to achieve the research aim and address the research objectives, nine questions were ascertained for this research:

i. How can educational experience play a part in the formation and development of PI?
ii. How can practice or work experience play a part in the formation and development of PI?
iii. How do current and future professionals perceive their PI?
iv. What are the influencing factors in forming and developing PI?
v. How can educational experience play a part in the formation and development of attitudes towards sustainability?
vi. How can practice or work experience play a part in the formation and development of attitudes towards sustainability?
vii. How do current and future professionals perceive sustainability?
viii. What are the influencing factors in forming and developing attitudes towards sustainability?
ix. What interplay, if any, exists between the two concepts, and how could this help contribute towards more sustainability practices?

All the research questions were investigated using semi-structured interviews from four different snapshots of the journey; new students (NSs), final year students (FYSs), novice practitioners (NPs), and chartered quantity surveyors (CQSs). The next section presents a summary of the major findings and discussion based on the nine research questions.

7.3 Major Findings and Discussions

7.3.1 How can educational experience play a part in the formation and development of PI?

Identification with the profession for some of the students had already begun before they embark on formal professional education. This identification is especially seen in those with some work experience, or with a connection to the profession through family members or friends of the family members. The formal professional education was considered to provide students with a relatively clear picture of the QSing profession and the roles of QS professionals. The educational experience, therefore, helps in the formation and development of the students' PI. The PI construction is enhanced through exposure to practice or work (during industry placement or internship). The students' PI, however, is not as apparent and constructed at the highest level at this stage of learning, as highlighted by Jebril (2008). Jebril (2008) asserted that during this stage, awareness of one's professional self-evokes. Some FYSs did discover their traits that fit the profession, for example, interest in law and skills in mathematics (as these relate to the financial and contracting aspects of the QS profession). However, the majority of them were not very confident in describing their PI as they think that there is still a considerable amount to learn and skills to develop in order to become a competent QS.

Nonetheless, a number of graduates (the NPs) commented that their degree programme provided them with the fundamental understanding and relevant skills for work. This is especially for those who can practice their understanding and skills gained during the learning stage. Also, this is dependent on the course that should accurately reflect the practice in the industry as some participants disagreed (i.e. not much is applicable) and, on students' engagement with their learning. These are probably why they (FYSs and NPs) have differing opinions about their degree programme.

7.3.2 How can practice or work experience play a part in the formation and development of PI?

Work experiences (with improving knowledge and skills) combined with preparation for chartered membership is not just refining NPs' PI but also reinforcing it. Through exposure to QS-related works and QS professional on a daily basis, the NPs started to develop more interest in their career and profession and discover more characteristics within their professional self that fits their profession. In addition, they take pride in their role and as well as the values and importance of their profession within the BE sectors. They also started to pay attention to issues related to the profession (not enough acknowledgement and rumours that BIM will take over the QS roles). However, despite hearing rumours on the emergence of computer-aided software (e.g., BIM) that were also claims to reduce and take over the QSs' roles, these NPs are confident that the profession will continue to be relevant and important to the sector. This attitude and commitment towards one's profession are a reflection of the integration of professional self, profession and professional values, and it forms one's behaviour, i.e. one's PI (Jebril, 2008). The accumulation of experience thus strengthens the practitioners' PI, and this is evident from the interview with the CQSs as they attained specialisations in their work area. Some of them also grow up in the management hierarchy and become managing director, for instance.

7.3.3 How do current and future professionals perceive their PI?

The students found it hard to describe their PI, and some might not think that they have it. Half of them described it in relation to the roles of a QS in general, and some relate it with the understanding and experience that they have gained during their degree programme.

The majority of NPs described their PI in relation to their role as a QS, and they felt that they are compatible with their roles (e.g., ethical, enjoy working with numbers). The CQSs have more conviction when describing their PI, and all of them related it to their professional role. To a number of CQSs, they were also describing their other positions and responsibilities (i.e. project manager, employer's agent) as part of who they are as well. However, only four practitioners (one NP and three CQSs) associated their professional body (the RICS) with their PI. The research established that most of the practitioners' PI identifications are lacking the essential elements of professionalism, particularly the belief in public service in their commitment to social good.

7.3.4 What are the influencing factors in forming and developing PI?

The factors that contributed to the formation and development of PI during formal professional education are specific modules (e.g., the programme-specific and projects), work-related experiences (placement or internship), as well as the status and reputation of the QS profession. These factors make the students feel more connected to the profession as they got to learn and understand more about it, which consequently made the students conscious of their ability, potential and interests towards the profession. Also, these factors made them feel more like a QS, drawing them more towards the profession and imagining themselves as a future QS.

During the working stage, peers and colleagues and preparation for the accredited status (chartership) played a huge role in shaping the early careers' PI. This stage is crucial as it will determine the kind of practice direction that the early career will take, especially when their peers and colleagues have a significant impact on the choices they make (i.e. learning through example). In addition, daily engagement and involvement with work strengthen the practitioners' identification with the profession and as well as their PI.

7.3.5 How can educational experience play a part in the formation and development of attitudes towards sustainability?

With differing opinions (from the FYSs and NPs) on the level of involvement, these participants agreed that their degree programme engages elements of sustainability. The programme's sustainability engagement had positive and varying impacts on the students. It is positive in a way that made them aware of the issues related to sustainability. However, some of them thought that what they learnt about sustainability was not related to their future profession. Nevertheless, it is also worth noting that a number of students showed a slight interest in sustainability practices. However, there were grey areas whether they develop such enthusiasm from their programme or directly from their values. For instance, three FYSs would like to see the construction industry, in particular, to be more sustainable in the future. It is an interesting finding as they mentioned this before questions regarding sustainability were asked. Moreover, none of the NPs and CQSs mentioned anything about sustainability as part of the changes that they would like to see in the future.

7.3.6 How can practice or work experience play a part in the formation and development of attitudes towards sustainability?

Even though most of the NPs have yet to be involved in sustainability practices in their work, their company's engagement with sustainability did have an impact, particularly on their awareness of it. The CQSs asserted that their involvements with sustainability were mostly through fulfilling their contractual obligations. Therefore, sustainability adoptions in their projects resulted from either their client's requirements or regulation.

7.3.7 How do current and future professionals perceive sustainability?

All of the participants in this research were aware of the issues and the importance of sustainability. Most of the practitioners, including FYSs, asserted that the QSs roles and responsibility towards sustainability were established through their advisory role, particularly in relation to the cost or financial aspect of it. As mentioned in the findings from the previous question, the CQSs stated that most of their work involvements with sustainability are either from their clients or to comply with regulations. In this regard, they would do their best to fulfil these obligations. However, none of their responses implied that the sustainability efforts emerged from their motivation and aspiration for the greater good.

7.3.8 What are the influencing factors in forming and developing attitudes towards sustainability?

Sustainability-specific and projects modules are the key influences in the emergence of attitudes towards sustainability during the formal professional education stage. These modules did not just provide awareness and understanding to the students but also, through these modules, the students can connect sustainability to their future role as a QS. As for the NPs, since most of

them were still not directly involved with the sustainability aspects of their industry during the practice or working stage, most of their awareness of sustainability was established through their company's sustainability programme. In addition, the concept is also part of the APC competencies, and all of the NPs were at that stage preparing for the assessment. The CQSs, on the other hand, were directly involved in such projects. Therefore, experiences do play an essential role in forming and developing attitudes toward sustainability.

7.3.9 What interplay, if any, exists between the two concepts, and how could this help contribute towards more sustainability practices?

A number of participants from the NSs, FYSs and NPs showed optimism and enthusiasm towards sustainability. The more senior practitioners became more aware of their roles and responsibilities (including towards sustainability) as they gained more knowledge, skills and experience of their profession. The tensions that existed in the enactment of sustainability was when the project went over budget due to sustainability measures, the lack of cost data to consider sustainable options and finally, to find and make sure that the adoption of sustainability was going to work as claimed. However, the enactment of their professionalism lacked the essential values of a profession, particularly, in relation to a belief in public service (also apparent within the NPs as well). This is evident when they described their PI, QSs' moral and ethical responsibilities, as well as their roles and responsibilities in adopting sustainability.

In this regard, their focus was primarily their clients and not the broader society. Therefore, since they are not considering the public at large, sustainability to them was only part of their job's requirement. Hence, they would do their best to fulfil that obligation. However, if sustainability was not part of the job, then they would not consider it and would rely on others (designers or regulations) to be innovative and to put it in a project. This lack of enthusiasm

towards sustainability seems unproblematic to them. The optimism and enthusiasm towards sustainability can be seen in some of the NSs, FYSs and NPs. However, they are not apparent among the CQSs.

7.4 Contribution to Knowledge and its Implications

One way in which this research has extended understanding about the lack of sustainability practices within the BE professionals in the UK is to explore and understand the tensions that exist between the enactment of professional role and serving the greater good. Much of the literature does not extensively address issues pertaining specifically to QSing professionals. Most literature had paid attention to the economic, political and technological changes that underlie humanity's response to sustainability without recognising the importance of professionals in meeting the normative expectations of their profession, i.e. to serve their client and the public.

By exploring the experiences of current and future professionals, this research revealed how their experiences were not homogenous. While some will be universal (the notion of the profession), others will be contextually specific (level of exposure, involvement or engagement). In addition, the findings of this research indicate that many of the tensions that the participants face have led and may lead to a significant impact on their professional practice either currently or in the future. Some of the tensions were more to do with their justification in passing the sustainability responsibility to their clients and designers. The short-term approach, according to them, was to satisfy the clients as opposed to balancing responsibility, although they insisted that satisfying the clients would also lead to serving the greater good.

This kind of practices poses two threats. One is that professionals may never consider the consequences of their practices to the broader society. Does this attitude question the profession's usefulness or the value of the profession to the public? It is essential for the profession through its professional bodies to find ways (e.g., through APC and CPD) to instil the need to prioritise sustainability in every member. The success will be evident in their practices and their attempt to be more relevant. Second, this kind of practices may consequently be exemplified in the early stages of their careers (i.e., the novice practitioners) as they will observe and learn significantly from their superiors and senior colleagues.

As for the educational institutions, this research establishes an area that needs improvement as the research findings identified a potential agent of change towards a more sustainable approach, starting with the student participants. As the research findings revealed some contrasting opinions regarding sustainability among the final year students and graduates (novice practitioners), educational institutions thus need to find ways to instil students with strong and positive attitudes towards sustainability. In addition, professional education also needs to think of how to foster graduates who are more explicitly aware of the changes that needed to be addressed within their future profession or area of practice. In this regard, graduates need to be equipped with the knowledge, skills and competencies to face the challenges and subsequently enact and be the catalyst of change as it is no longer effective to rely on clients, legislation and regulations to establish sustainability practices in the industry.

7.5 Limitations of the Research

Although the data yielded valuable information that is important to the QS educational programme and profession, no research is without its limitations. Like any other research, it is the researcher's wish that the limitations of this study could support other researchers.

This research constitutes a snapshot of what was happening at different points of the participants' professional journey (a cross-sectional approach). Therefore, it would be interesting to observe whether these participants' understanding of their PI and attitudes towards sustainability changes or unaffected over time from the beginning of their formal professional education to the stage of practice and at a later stage when they have obtained considerable work experiences. A longitudinal approach, for instance, may yield valuable information regarding the development of participants' PI over time.

Three categories of participants (NSs, FYSs, and NPs) were recruited from a university in Southeast England. The selection of participants allowed for reflections of a specific curriculum, and its limitation. Due to the significant discrepancies in the curricula across the UK, the researcher felt that collecting data from one educational programme would at least provide a level of commonality from the participants' educational experiences. A different sample of these three categories from other universities in England might reflect different experiences and perceptions. Similarly, a broader, more diverse sample would have enabled more significant insight into differences in experiences and perceptions. Despite this, the research offers useful insights that could serve as a framework for other researchers exploring PI and attitudes towards sustainability, and the enactment of professionalism, particularly in relation to sustainability.

In addition, the researcher primarily chose a face-to-face interview approach, thereby limiting the study site to a certain part of England. The option of facilitating the interviews via other means (e.g. electronic means) was considered and would have increased the sample size and as well as added to the richness of the data. However, the reason to opt for the face-to-face interview is due to a higher comfort level, which enabled the researcher to gain information at a deeper and richer level of understanding. The researcher also felt that the researcher had a sufficient number of participants to provide the research with information that would yield meaningful results.

The research did not have a representation of female participants from the CQS category, although they were contacted to participate. From the interviews, a number of FYSs and NPs said that they would like to see more women in the construction industry. This may infer that the industry is still a male-dominated industry (Martin and Barnard, 2013). However, this study did not explore the gender issue since the researcher was able to incorporate the data from the participants into the existing themes. The gender ratio, particularly from the practitioner's participants, indicates a possibility that the themes might have been influenced by gender and the way it contributes to identity development.

7.6 Recommended Areas for Further Study

This research adopted a cross-sectional design that helps to understand what happened during different points of time that shape and influence the formation and development of PI and the attitudes towards sustainability. A follow-up study would be helpful to explore a longitudinal perspective that may provide greater insight into the development of the two concepts. Will their PI and attitudes towards sustainability continue to be constructed and shaped as suggested in this research? With more work experience, will future professionals (particularly FYSs and

NPs) perceive that they have a greater ability to enact change and be the champion for sustainability?

This research is based on the experiences of students and graduates of the QS degree programme from the University of Reading and CQSs in Southeast England. The responses from the educational perspectives were uniquely derived from the students and graduates from one university and one curriculum. Therefore, collecting data from other universities with different educational approaches may yield greater insight into the participants' experience and perceptions. This is also applicable to the participants from the practitioners' categories (widening the area of research to cover the whole of England). A broader and more diverse sample may offer transferability of the findings to other programmes or professions.

In addition, it is also worth considering other sources of information as well. By conducting interviews with university's academics, for instance, an even greater depth could be achieved in the context of professional education as academic also plays an integral part in influencing students' PI and attitudes towards sustainability as suggested by the research and existing literature (Mochizuki and Fadeeva, 2010; Wiedman et al, 2001). Interviewing line managers who are directly involved with graduates' (early careers or novice practitioners) professional development would also be valuable. This is due to the fact that NPs in this study said that they are working closely with their line managers who may have a greater influence on the NPs' current and future practices. These other sources of information are indeed a perspective worth considering.

A gender issue that was raised during the interviews has suggested that more females should be involved in the construction industry. The industry is still largely a male-dominated sector, and there are questions yet to be explored regarding gender-related identity in relation to attitudes

towards sustainability and potential agent for change for sustainability. This study, however, did not identify any differences in how participants' PI and attitudes towards sustainability are developed between the male and female of FYSs and NPs. Would there be any differences among the CQSs'? If there are any differences, would these differences relate to how CQSs perceived their involvement and contribution towards the sustainability agenda? This is an area that is also worth considering.

The above are suggested research areas that could be conducted on a similar population using different perspectives, different locations and even approaches. All of these could potentially add an in-depth understanding of the experiences, the interplay between PI and attitudes towards sustainability and the tensions that exist within the enactment of CQSs professionalism in relation to sustainability.

7.7 Concluding Remarks

This research focused on individual experience in their formation and development of PI and attitudes towards sustainability and the perceptions and enactment of their professional roles and responsibilities in relation to sustainability. It is a pioneering study showing the emergence of PI in the BE sector and the tensions that exist in the enactment of CQSs' professionalism towards sustainability. Although knowledge, skills and experience strengthen QS professionals' PI, a lack of sense of service to the public and the greater good may have deviated their attention towards their clients and to a short-term focus. Also, they may have treated sustainability as a job obligation and thus relying on others (e.g. designers and regulation) to adopt and implement sustainability in a project. The research forms a research platform for educational institutions and professional bodies to determine different actions and strategies for PI and sustainability in the BE sector. The findings shed light on the emergence of PI and attitudes towards

sustainability, and the interplay between the two concepts. The findings also uncover the tensions that exist in the enactment of professionalism in relation to sustainability and provide suggested areas of improvement for more sustainability practices in the BE sector and in particular, the construction industry.

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Appendix A: Information sheets

Information sheet for new students

School of the Built Environment
University of Reading
Whiteknights
Reading
RG6 6AW

INFORMATION SHEET

My name is Nurulaini Hafizah Mohd Hafir and I am a PhD student in the School of the Built Environment, University of Reading.

I am carrying out research on the role of professional identity formation in the development of sustainability practices in the built environment. The purpose of this interview is to gain a better understanding of your initial motivations in enrolling in the quantity surveying programme, your expectations during and after you've completed your study and your future aspirations.

If you are willing to be interviewed you will be asked to participate in an interview of about 10-20 minutes, at an agreed time and place convenience to you. During the interview I will ask you questions on your views and perspectives which means that your answers will not be judged as wrong or right. With your permission, I would like to tape the interview and transcribe section later. Copies of the transcript will be available on request and any changes which you ask for will be made. You can choose not to answer any questions. You are free to withdraw from the study at any time.

At every stage, your identity will remain confidential. Your name and all identifying information will be removed from the written transcript. The data will be kept securely and destroyed when the study has ended, which will be a maximum of 36 months from the completion of the research. The data will be used for academic purposes only.

Copies of any outputs, such as articles or presentation slides, will be available on request. If you have any further questions about the study, please feel free to contact me or my supervisor.
Researcher: Nurulaini Hafizah Mohd Hafir / [redacted]
Supervisor: Dr Tim Lees / [redacted]

This project has been subject to ethical review, according to the procedures specified by the University Research Ethics Committee, and has been given a favourable ethical opinion for conduct.

Thank you for your help.

Signed: NURULAINI HAFIZAH MOHD HAFIR
Date: 18 April 2017

Information sheet for final year students

School of the Built Environment
University of Reading
Whiteknights
Reading
RG6 6AW

INFORMATION SHEET

My name is Nurulaini Hafizah Mohd Hafir and I am a PhD student in the School of the Built Environment, University of Reading.

I am carrying out research on the role of professional identity formation in the development of sustainability practices in the built environment. The purpose of this interview is to gain a better understanding of your initial motivations in enrolling in the quantity surveying programme, what have you learned so far and your expectations during and after you've completed your study and your future aspirations.

If you are willing to be interviewed you will be asked to participate in an interview of about 20-30 minutes, at an agreed time and place convenience to you. During the interview I will ask you questions on your views and perspectives which means that your answers will not be judged as wrong or right. With your permission, I would like to tape the interview and transcribe section later. Copies of the transcript will be available on request and any changes which you ask for will be made. You can choose not to answer any questions. You are free to withdraw from the study at any time.

At every stage, your identity will remain confidential. Your name and all identifying information will be removed from the written transcript. The data will be kept securely and destroyed when the study has ended, which will be a maximum of 36 months from the completion of the research. The data will be used for academic purposes only.

Copies of any outputs, such as articles or presentation slides, will be available on request. If you have any further questions about the study, please feel free to contact me or my supervisor.
Researcher: Nurulaini Hafizah Mohd Hafir /[redacted]
Supervisor: Dr Tim Lees /[redacted]

This project has been subject to ethical review, according to the procedures specified by the University Research Ethics Committee, and has been given a favourable ethical opinion for conduct.

Thank you for your help.

Signed: NURULAINI HAFIZAH MOHD HAFIR
Date: 18 April 2017

Information sheet for novice practitioners

School of the Built Environment
University of Reading
Whiteknights
Reading
RG6 6AW

INFORMATION SHEET

My name is Nurulaini Hafizah Mohd Hafir and I am a PhD student in the School of the Built Environment, University of Reading.

I am researching the role of professional identity formation in the development of sustainability practices in the built environment. The purpose of this interview is to gain a better understanding of your initial motivations when you enrolled in the quantity surveying programme, your expectations during and after you've completed your study, the transition and practice/working experience. Exploring on your perception towards the quantity surveying profession and also on the construction industry in general.

If you are willing to be interviewed you will be asked to participate in an interview of about 20-30 minutes, at an agreed time and place convenience to you. During the interview I will ask you questions on your views and perspectives which means that your answers will not be judged as wrong or right. With your permission, I would like to tape the interview and transcribe section later. Copies of the transcript will be available on request and any changes which you ask for will be made. You can choose not to answer any questions. You are free to withdraw from the study at any time.

At every stage, your identity will remain confidential. Your name and all identifying information will be removed from the written transcript. The data will be kept securely and destroyed when the study has ended, which will be a maximum of 36 months from the completion of the research. The data will be used for academic purposes only.

Copies of any outputs, such as articles or presentation slides, will be available on request. If you have any further questions about the study, please feel free to contact me or my supervisor.
Researcher: Nurulaini Hafizah Mohd Hafir / [redacted]
Supervisor: Dr Tim Lees / [redacted]

This project has been subject to ethical review, according to the procedures specified by the University Research Ethics Committee, and has been given a favourable ethical opinion for conduct.

Thank you for your help.

Signed: NURULAINI HAFIZAH MOHD HAFIR
Date: 18 April 2017

Information sheet for chartered quantity surveyors

School of the Built Environment
University of Reading
Whiteknights
Reading
RG6 6AW

INFORMATION SHEET

My name is Nurulaini Hafizah Mohd Hafir and I am a PhD student in the School of the Built Environment, University of Reading.

I am carrying out research to gain a better understanding of what Chartered Quantity Surveyors perceived as their professional identity, factors influencing this identity development and how it affects them personally and professionally.

If you are willing to be interviewed you will be asked to participate in an interview of about 30-45 minutes, at an agreed time and place convenience to you. During the interview I will ask you questions on your views and perspectives which means that your answers will not be judged as wrong or right. With your permission, I would like to tape the interview and transcribe section later. Copies of the transcript will be available on request and any changes which you ask for will be made. You can choose not to answer any questions. You are free to withdraw from the study at any time.

At every stage, your identity will remain confidential. Your name and all identifying information will be removed from the written transcript. The data will be kept securely and destroyed when the study has ended, which will be a maximum of 36 months from the completion of the research. The data will be used for academic purposes only.

Copies of any outputs, such as articles or presentation slides, will be available on request. If you have any further questions about the study, please feel free to contact me or my supervisor.
Researcher: Nurulaini Hafizah Mohd Hafir / [redacted]
Supervisor: Dr Tim Lees / [redacted]

This project has been subject to ethical review, according to the procedures specified by the University Research Ethics Committee, and has been given a favourable ethical opinion for conduct.

Thank you for your help.

Signed: NURULAINI HAFIZAH MOHD HAFIR
Date: 18 April 2017

Appendix B: Consent form

CONSENT FORM

1. I have read and had explained to me by Nurulaini Hafizah Mohd Hafir the Information Sheet relating to this project and any questions have been answered to my satisfaction.

2. I understand that my participation is entirely voluntary and that I have the right to withdraw from the project any time, and that this will be without detriment.

3. I understand that my personal information will remain confidential to the researcher and her supervisors at the University of Reading, unless my explicit consent is given.

4. I understand that my organisation will not be identified either directly or indirectly without my consent.

5. I agree to the arrangements described in the Information Sheet in so far as they relate to my participation.

Name:

Signature:

Date:

Appendix C: Demographic data forms

Demographic data form for students

DEMOGRAPHIC DATA

Age: _____

Sex: Male: _____ Female: _____

Ethnicity: _____

Previous Education:

_____

_____

Work experience (List all different jobs you have had):

_____

_____

_____

_____

_____

_____

_____

_____

Thank you

Demographic data form for practitioners

DEMOGRAPHIC DATA

Age:

21-25: _____ 26-30: _____ 31-35: _____

36-40: _____ 41-45: _____ >45: _____

Sex: Male: _____ Female: _____

Ethnicity: _____

Years of experience: _____

Educational level:

Undergraduate: _____ Postgraduate (Master): _____

Postgraduate (Doctorate): _____ Others (please state): _____

List all different jobs you have had:

_____

_____

_____

_____

_____

_____

_____

_____

Thank you.

Appendix D: Interview questions

Interview questions for new students

1. What made you decide to enrol in QS programme and to pursue QS profession?
    - *Motivations, inspirations, role model, people who have had a significant influence (who and how)?*
    - *What do you know about this QS profession?*

2. What do you expect to gain from this programme? *Theory, experience, practical.*

3. Apart from attending classes, do you plan on doing something else that might help your learning and prepare for work perhaps? Guidance?

4. Have you heard of the Royal Institution of Chartered Surveyor (RICS)?
    - *What do you know about this institution?*

5. How would you describe someone as being a professional?

6. What kind of professional do you think you will be?

7. Do you know what professional identity is? How would you describe this term?

8. Have you heard about sustainability? Where? How?

9. What do you think are important around this sustainability?

10. How do you think you can personally contribute towards sustainability?
    - *Are they personally committed (despite not really learnt about it)?*

11. How do you think professionals can contribute towards sustainability?

Interview questions for final year students

1. What made you decide to enrol in QS programme and to pursue QS profession? Since when?

2. When you were studying, apart from attending classes, how did you go about learning something that you think important to know that would help you prepare to be a good QS practitioner? -guidance

3. Have you took part or been to any RICS programmes during your study? The website? *What you got or received or learnt from there?*

4. You've been through the job interview, right? What were your selling points during the interview?

5. Do you think the educational programme that you've been through helped you prepare for work? How was the transition?

6. In your opinion, what makes this QS profession different or unique and the importance of this profession in the construction industry?

7. What do you think or imagine you will be doing / going to do in 18 months from now?

8. A Chartered QS. Are you planning to become one?
    - What does it mean for you to become a chartered QS?
    - Do you ever think about the advantages of having this status? The disadvantages?
    - What do you think are the moral / ethical responsibility of QS professional?

9. How would you describe (yourself) your identity as a QS practitioner?
    - What have been key experiences in shaping this identity?

10. What kind of changes would you like to see in the construction industry?

11. Did learning in some ways engaged with sustainability? How about the work?

12. What do you think are important around this sustainability?

13. What do you think you can personally and professionally contribute towards sustainability?

14. Do you think QS professionals (profession) in general have any role and responsibility towards sustainability? What do you think they can or should do?

Interview questions for novice practitioners

1. What made you decide to enrol in QS programme and to pursue QS profession?

2. When you were studying, did you involve with any of the RICS programmes?

3. You've been through the job interview, right? What were your selling points during the interview?

4. When you first started working, what were your impressions as graduate and new employee? **As expected? How was the transition?*

5. Do you think the educational programme that you've been through helped you prepare for work?

6. In your opinion, what makes this QS profession different or unique and the importance of this profession in the construction industry?

7. What do you think are the moral and ethical responsibilities of QS professional?

8. Who or where you look to for guidance in this profession? *–people, APC, document*

9. What do you think you will do or plan to do for the next couple of years?

10. A Chartered QS. Are you planning to become one? What does it mean for you to become a chartered QS?

11. Do you ever think about the advantages of having this status? The disadvantages?

12. How would you describe (yourself) your identity as a QS practitioner?
    - Do you think you had already formed this identity when you were a student?
    - What have been key experiences in shaping this identity? *Learning? Practice? RICS?*
    - After you finished your undergraduate study, did you feel more drawn to become QS?
    - Does the RICS in some way, making you feel strongly connected to QS profession?

13. Did you ever face any conflicting situation or dilemma since you started working in this QS profession?

14. What kind of changes would you like to see in the construction industry?

15. Has sustainability in any way been part of your work?
    - Did you learn about sustainability during your undergraduate study?

16. What do you think are important around this sustainability aspect?

17. Do you think QS professionals (profession) in general have any role and responsibility towards sustainability?

Interview questions for chartered quantity surveyors

1. Do you still remember what made you decide to become a QS? **Influences.*

2. In your opinion, what makes this QS profession different or unique and the important of this profession in the construction industry? **What are the characteristics of your profession that makes it different from others? *Do you think these characteristics are enhancing or hindering the uniqueness of your profession?*

3. What do you think are the moral and ethical responsibilities of QS profession and QS professional?

4. Were there or are there any conflicts or clashes between you as an individual (your own personality and values) with QS profession? **the profession has its own values, aspirations…*

5. As a Chartered QS. Do you ever think about the advantages and disadvantages of having this chartered status? **The impact of having this status towards your work and career?*

6. Do you remember the time when you realised that you are now a professional? "Yes, I am now a professional". **Are there any differences between before and after you become a professional?*

7. In your opinion, can anybody be a professional?

8. Do you think chartered QSs have a clear understanding of what their professional identity is? **Why/why not?*

9. How about the RICS in projecting professional identity among its members? Providing clear definition or explanation of PI?

10. How would you describe your professional identity? **Characteristics of that identity.*
    - Do you think it is a collective identity or something that is personal to you?

11. What have been key experiences in shaping your professional identity? **When is it elevated? *When is it diminished?*

12. How do your professional identity/values match with your workplace culture? **Any clashes between your professional identity and your workplace? *Is work permits you to be yourself and exercise your sense of self?*

13. How do you see your role as a Chartered QS in society?

14. Do you think public perception has weighting over the creation of professional identity? **Do you think chartered QS project their professional identity and this made clear to the public?*

15. What are the challenges have you faced so far in your professional role? **How you handled them? The impact of this? *Did you think of changing your practice area / profession? How you dealt with contradictions between your beliefs and work activities.*
    - Did that has anything to do with your personal or professional belief? How did you deal with it?

16. What kind of changes would you like to see in the construction industry in the future?
    - What kind of industry you want it to be and to flourish into?

17. Has sustainability in any way been part of your work? **Examples? –own contributions?*

18. What do you think are important around this sustainability aspect?

19. Do you think QS professionals (profession) in general have any role and responsibility towards sustainability? **In what ways? How to incorporate sustainability in their work?*

20. What do you think currently of the construction industry in embracing and practising sustainability?

21. Any other comments that you think would contribute to this research study?

Appendix E: Sustainability in programme's modules

YEAR 1:

Construction Science

Aims:
Overall:

•To provide an understanding of the scientific and engineering principles of construction materials, the internal environment and environmental services.
•To enable the scale of forces, heat loads, Illuminance and sound to be calculated.
•To develop knowledge of water based and electrical engineering systems.

Construction Technology

Assessable learning outcomes:
By the end of the module students should:

• Understand the sequence of feasibility, design and construction for low-rise buildings.
• Be able to explain the technology used in the construction of simple low-rise buildings.
• Be capable of recounting how elements are constructed.
• Describe the advantages and disadvantaged of alternative construction methods.
• Understand the importance of building control, impact of legislation and constraints imposed by the Building Regulations on methods, materials and design.
• Acknowledge the variety of materials and construction techniques used in different parts of the world.
• understand the concept of sustainable construction and how new technologies can be incorporated in the construction of sustainable low-rise buildings.

YEAR 2:

Building Environment Systems

Assessable learning outcomes:
Assessable outcomes

Students will be able to:-
• Understand the relationship among climate, urban climate and buildings.
• Understand passive environmental design and its relation to climate – appreciate the architectural design implication.
• Understand thermal comfort and indoor air quality.
• Examine the integration of environmental systems – heating, ventilation, air-conditioning, electric lighting, power, BEMS and IT, acoustics, water supply, drainage, active and passive fire safety provision systems,
• Understand the concept and integration of renewable energy systems for buildings and communities.
• Outline active and passive fire safety provision.

Construction Procurement

Additional outcomes:

Outline content:
•The legal, economic and organizational contexts of procurement of goods and services.
•Principles and strategies of construction procurement and tendering.
•Decisions and responsibilities in construction procurement and tendering.
•Relationships between procurement, tendering, contracts, funding, performance of projects.
•Commercial processes of structuring, negotiating and recording price and scope in contracts.
•Effective management of project risk using procurement and tendering mechanisms.
•Procuring for environmental sustainability.
•E-procurement and e-tendering of construction projects.

Construction Statutory Law

Outline content:

The module will include:

- An introduction to construction statutory law
- Overview of statutes relevant to business operations
- Building and control regulations
- Equality and diversity
- Sustainability and the environment
- Planning
- Health and safety
- Procurement law

YEAR 3:

Sustainability

Assessable learning outcomes:

1.Explain the broad environmental, energy and sustainability requirements for construction, buildings and development, including the impacts of climate change;
2.Analyse and quantify the energy requirements for buildings, including domestic energy; explain the role of energy efficiency in buildings;
3.Examine and analyse, both qualitatively and quantitatively, environmental impacts and carbon emissions arising from buildings in-use and during construction; recommend measures for the control of pollution, and environmental mitigation during construction;
4.Evaluate and apply Environmental Impact Assessment (EIA) methodologies;
5.Evaluate renewable energy systems and technologies for buildings, including their economic performance;

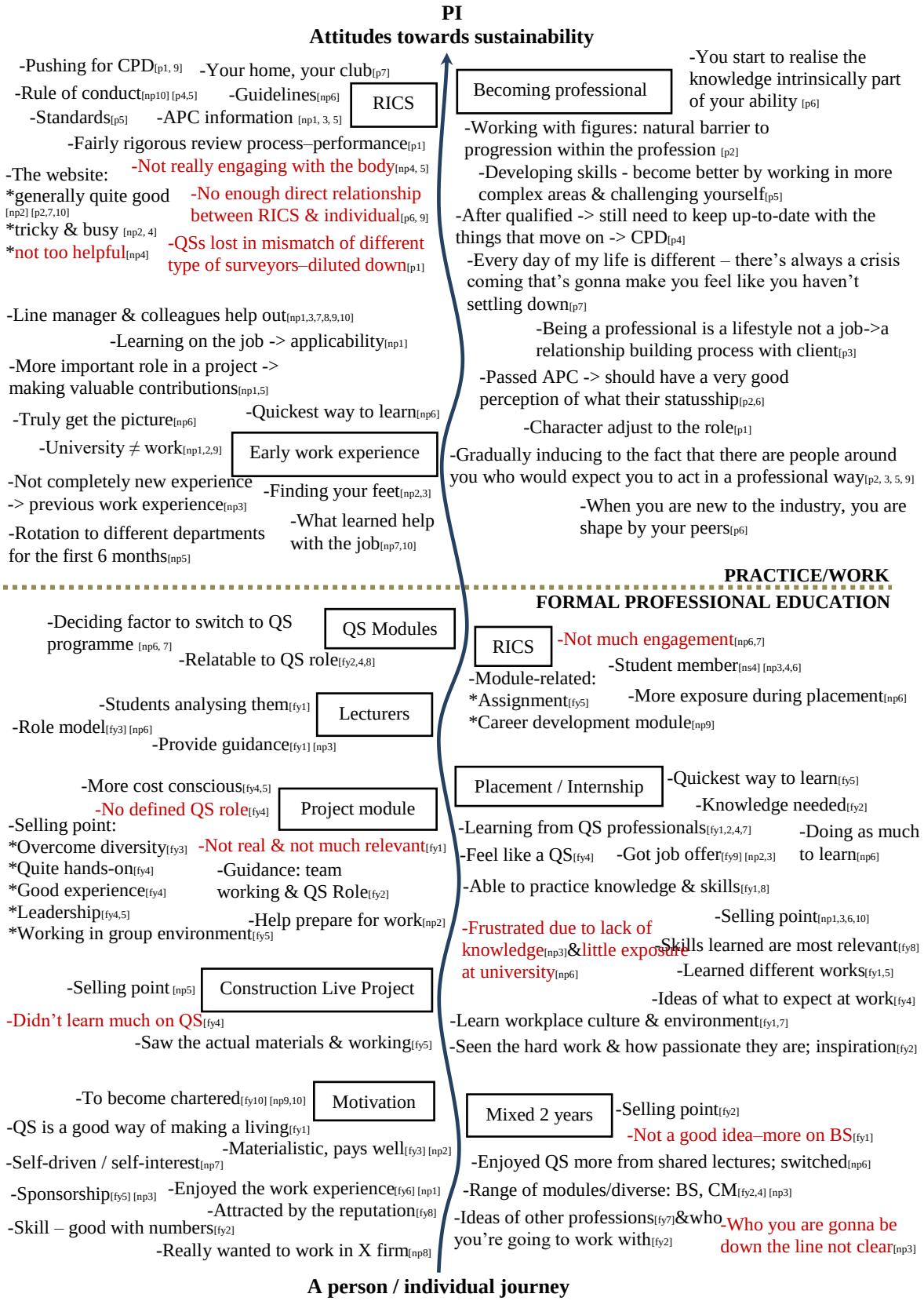
Urban Ecosystems

Assessable learning outcomes:

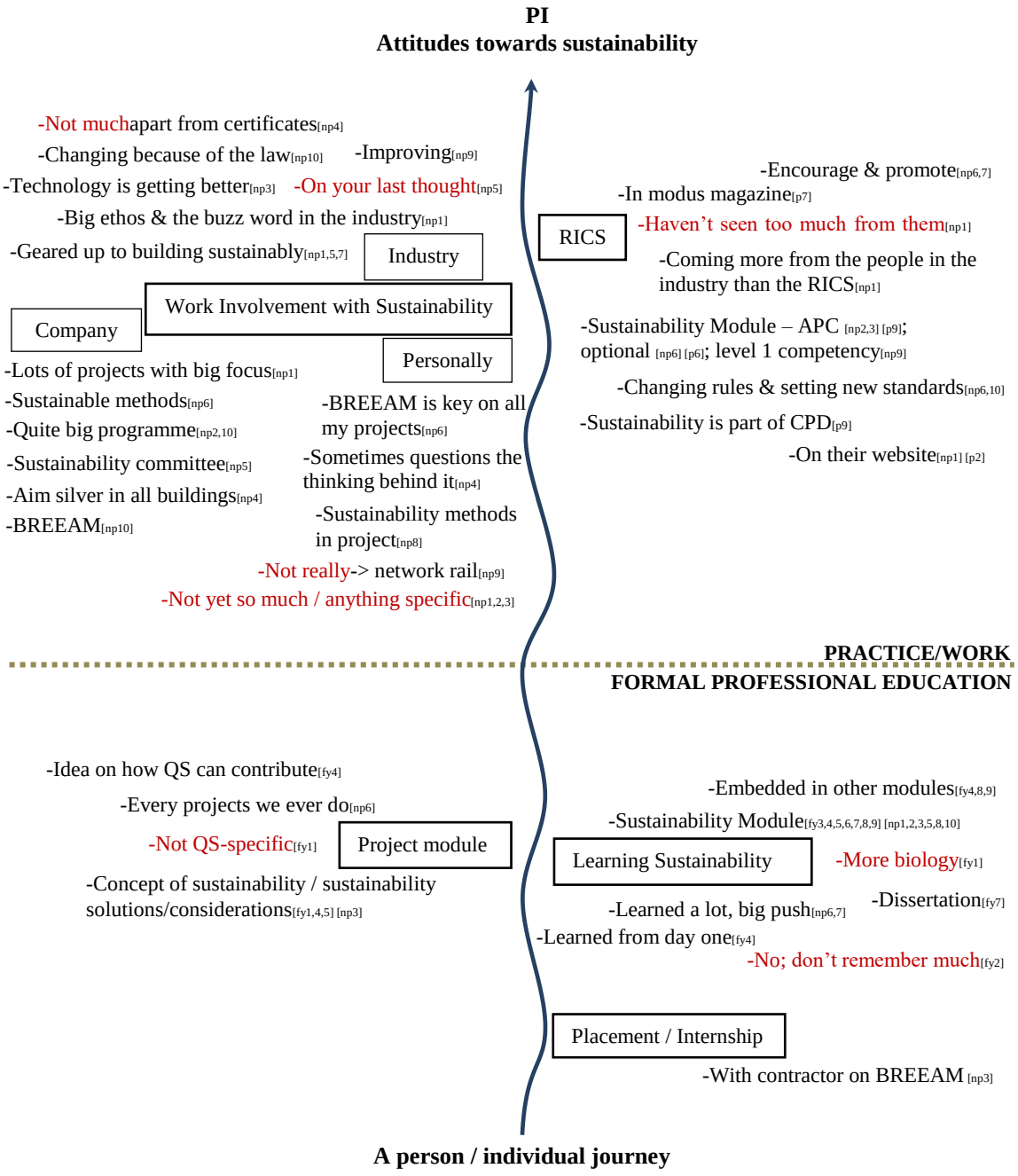
Demonstrate the limitations imposed on urban areas through thermodynamic principles; Evaluate the sustainability of resource consumption in the built environment; Describe the resource cycles and material flows that influence the built environment; Evaluate an urban metabolism case study; Compare and contrast carbon footprints of different cities; Discuss ways in which cities can be modeled after natural ecosystems to improve resource efficiency

(University of Reading, 2017a)

Appendix F: Illustration of the influencing factors



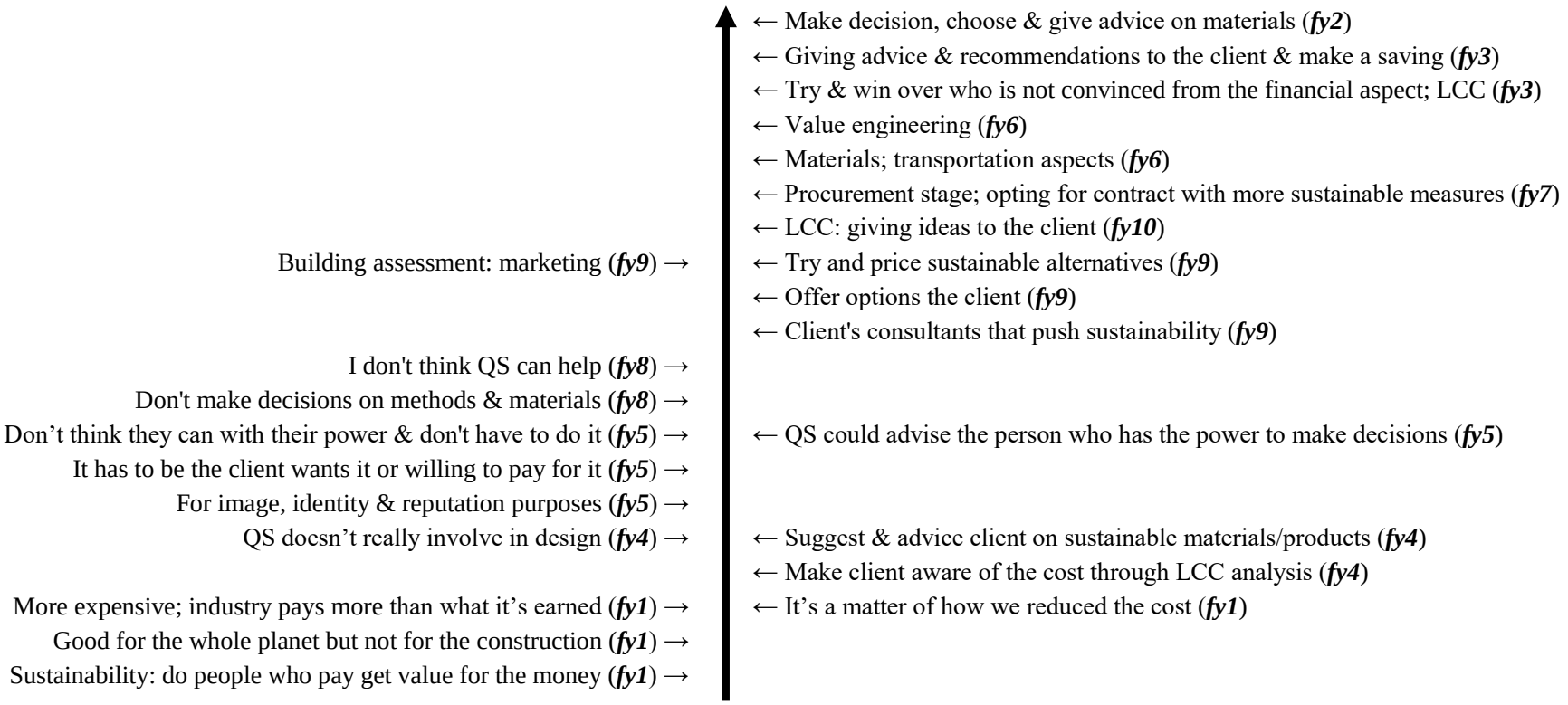
Factors influencing the formation and development of professional identity



Factors influencing the formation and development of attitudes towards sustainability

Appendix G: Details on the associated tensions

EMERGENCE OF PI

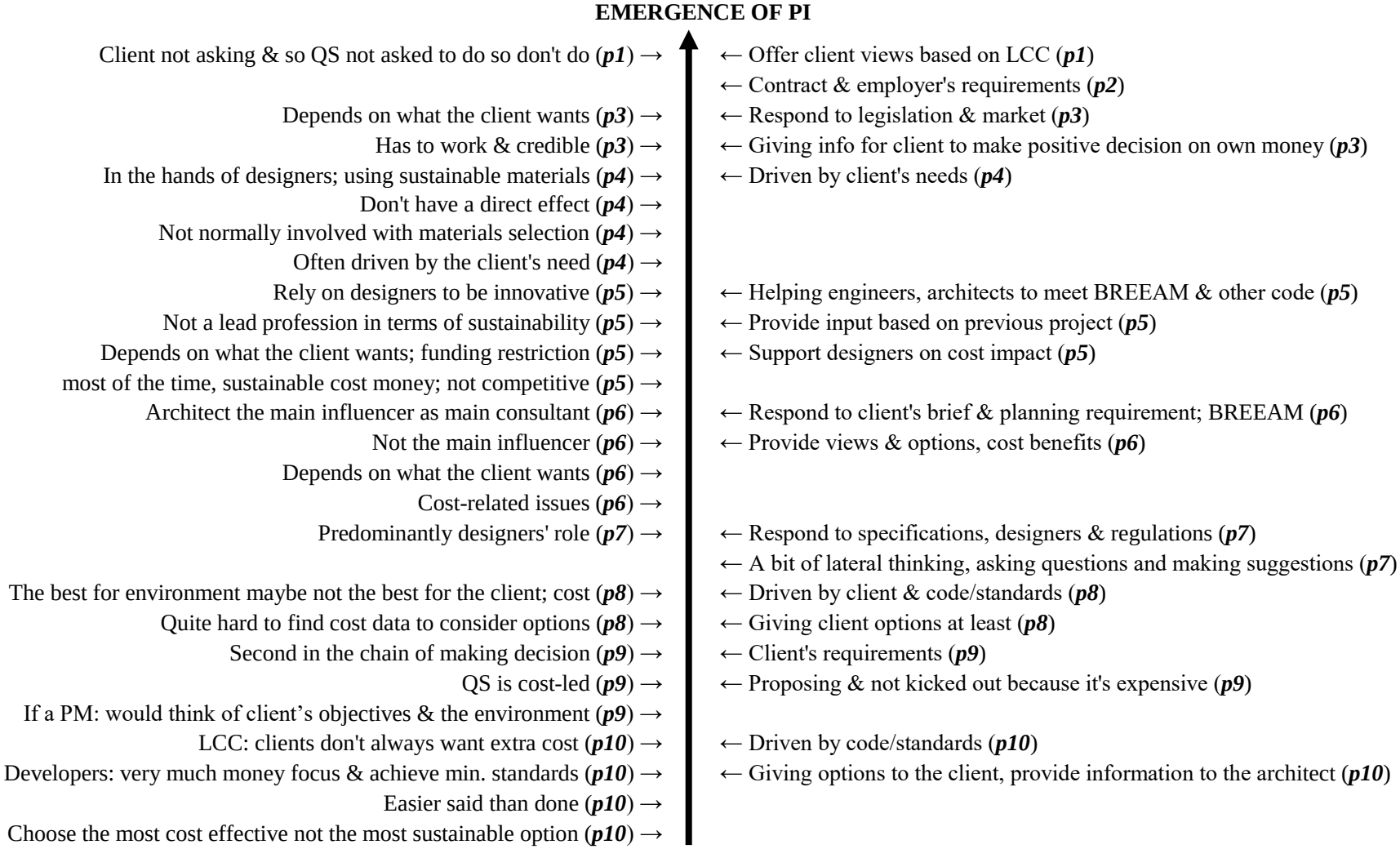


Associated tensions that exist from the FYSs

EMERGENCE OF PI

	← We have such a good knowledge of building materials (***np1***)
	← We do cost construction; know what is more sustainable what isn't (***np1***)
	← Responsibility to give advice; to architect & client on building materials (***np1***)
	← We could probably push that more to the client (***np1***)
Expensive solution: QSs say no more than they should (***np2***) →	← Client always want sustainable buildings; building assessment (***np2***)
	← Building assessment: sustainable materials (***np3***)
For image purposes (***np4***) →	← Building assessment (***np4***)
Min. requirements (tick box exercise); cost involved (***np4***) →	← Responsibility to make the client aware of types of options are out (***np4***)
	← Cost advice; capital, forecast (***np4***)
Can't get involve with materials used (***np5***) →	← Support during procurement (***np5***)
If it's not in the design, it's not us who then put it in (***np6***) →	← Through building assessment, sustainable methods (***np6***)
We don't design the sustainability elements (***np6***) →	← Driven by clients & regulation; relying on it being there to get involves (***np6***)
We don't do too much of criteria that meet BREEAM (***np6***) →	← Encourage, propose, suggest sustainable alternatives to suit the budget (***np6***)
For public image (***np6***) →	
Cost-related issues; affordability (***np7***) →	← Driven by clients (***np7***)
	← Critic, suggest, propose based on previous projects (***np7***)
	← A role to pushing sustainability agenda (***np7***)
Don't have direct involvement (***np8***) →	← Through sustainable methods (***np8***)
Marketing purposes (***np8***) →	← Design: help decide on cost if sustainable method is more cost efficient (***np8***)
	← Contract's obligations (***np9***)
Tightly link to the work of architects & engineers (***np10***) →	← Respond to client's requirements (***np10***)
Not our ultimate role (***np10***) →	← Through building assessment (***np10***)
Depends on what the client wants (***np10***) →	← Advice & if client can't afford: spark up their interest (***np10***)
	← Offer through cost plan: list of items with quoted on how to save money (***np10***)

Associated tensions that exist from the NPs


EMERGENCE OF PI
Client not asking & so QS not asked to do so don't do (p1) →
Depends on what the client wants (p3) →
Has to work & credible (p3) →
In the hands of designers; using sustainable materials (p4) →
Don't have a direct effect (p4) →
Not normally involved with materials selection (p4) →
Often driven by the client's need (p4) →
Rely on designers to be innovative (p5) →
Not a lead profession in terms of sustainability (p5) →
Depends on what the client wants; funding restriction (p5) →
most of the time, sustainable cost money; not competitive (p5) →
Architect the main influencer as main consultant (p6) →
Not the main influencer (p6) →
Depends on what the client wants (p6) →
Cost-related issues (p6) →
Predominantly designers' role (p7) →
The best for environment maybe not the best for the client; cost (p8) →
Quite hard to find cost data to consider options (p8) →
Second in the chain of making decision (p9) →
QS is cost-led (p9) →
If a PM: would think of client's objectives & the environment (p9) →
LCC: clients don't always want extra cost (p10) →
Developers: very much money focus & achieve min. standards (p10) →
Easier said than done (p10) →
Choose the most cost effective not the most sustainable option (p10) →
← Offer client views based on LCC (p1)
← Contract & employer's requirements (p2)
← Respond to legislation & market (p3)
← Giving info for client to make positive decision on own money (p3)
← Driven by client's needs (p4)
← Helping engineers, architects to meet BREEAM & other code (p5)
← Provide input based on previous project (p5)
← Support designers on cost impact (p5)
← Respond to client's brief & planning requirement; BREEAM (p6)
← Provide views & options, cost benefits (p6)
← Respond to specifications, designers & regulations (p7)
← A bit of lateral thinking, asking questions and making suggestions (p7)
← Driven by client & code/standards (p8)
← Giving client options at least (p8)
← Client's requirements (p9)
← Proposing & not kicked out because it's expensive (p9)
← Driven by code/standards (p10)
← Giving options to the client, provide information to the architect (p10)
Associated tensions that exist from the CQSs