# Understanding the Concept of Knowledge in Healthcare Services: A Grounded Approach

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A thesis submitted in partial fulfilment of the requirements of Sheffield Hallam University for the degree of Doctor in Business Administration

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2. None of the material contained in the thesis has been used in any other submission for an academic award.

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## Abstract

The objective of this dissertation is to explore the meanings of knowledge as understood by senior medical staff in the UK's National Health Service. It asks the question: 'What does it mean to know something?' The assumption is that an exploration of these meanings will help in designing systems to manage such knowledge. This is because the meaning of knowledge in the literature is contested and the models for its management are extremely variable, to the extent that it is proving challenging to establish knowledge management as an academic discipline or credible business tool. Twelve in-depth interviews were completed and analysed using a constructivist grounded theory approach. Six main categories were constructed. These are: finding motivating factors to pursue knowledge; interacting with knowledge sources; undergoing a process of knowledge acquisition; practising skills; seeking peers' views; and, finally, building confidence as knowledge. Confidence was selected as the core category and the backbone of the constructed theory. The constructed theory argues that confidence is an important, integral aspect of our knowledge. One knows something if one thinks *confidently* that one knows it. Someone who understands a subject very well but lacks confidence simply does not know that subject. On the other hand, people can be overconfident or possess completely unjustified, misplaced confidence in situations where they lack understanding or ability. According to the emergent theory, these individuals are still knowledgeable, albeit in an incorrect or negative way. The emergent theory provides a new understanding of the concept of knowledge: knowledge as a type of emotion, i.e. confidence. This differs from the current understanding of knowledge, which views it as either objective information that requires cognitive processing or as human behaviour that influences practice. According to the emergent theory, knowledge is not necessarily a logical mental process nor purposeful human behaviour, but a fallible emotion, which can be harder to measure, observe or control than the two former phenomena. Confidence is an essential feature of knowledge and this thesis concludes by proposing a tool for confidence management within the NHS.

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# Chapter 1

## Introduction

Issues related to knowledge are becoming increasingly central to the management of the majority of organisations (Dalkir and Beaulieu, 2017, p.2). Knowledge is considered the asset with the highest strategic importance (Grant, 1996):

> *"From now on the key is knowledge. The world is becoming not labor intensive, not materials intensive, not energy intensive, but knowledge intensive"* (Drucker, 1992, p.267).

Healthcare is a knowledge industry (Greaves *et al*., 2010) and so knowledge management is particularly important to services such as the UK's National Health Service (NHS). However, there is no agreement on the definition of knowledge and knowledge management. Dalkir writes:

> *"It may seem strange that knowledge management is almost always defined at the beginning of any talk or presentation on the topic (imagine if other professionals such as doctors, lawyers or engineers began every talk with 'Here is a definition of what I do and why'*)…*It is highly recommended that each organization undertake a concept analysis exercise to clarify their understanding of what knowledge management means in their own context"* (Dalkir and Beaulieu, 2017, p. 15).

Also:

> *"Developing a rigorous understanding of the nature of knowledge will provide a firm basis upon which to assess the extent to which it can be purposefully managed"* (Roberts, 2015, p.36)

This research project aims to understand the concept of knowledge within the NHS. The assumption is that such an understanding will help the management of knowledge within this vast organisation. This research seeks to understand how the staff make sense of, and interact with, the sources of knowledge, how they think these may influence their practice and, ultimately, what it means to know something. This project also aims to construct a theory, grounded in views elicited during interviews with NHS staff, to define the processes involved in their knowledge-seeking behaviour, with the aim of constructing a new definition of knowledge that is applicable in this context. Understanding the issues related to medical knowledge and their meanings should help to design a better knowledge management system for healthcare services.

My interest in pursuing this research question arises from my profession as a knowledge worker (I've been a hospital-based doctor since the age of 22) and also from my passion for knowledge (being in formal education until the submission of this thesis, aged 54). Knowledge (however it is defined), its uses and its effects on our lives has always been a fascinating subject to me. The effects of the findings of this project on my practice are discussed in the conclusion chapter.

**The literature review:**

The literature was reviewed in order to explain and justify the research question as well as discuss and explore the existing answers to such a question together with their limitations. The literature review (Chapter 2) shows that healthcare management involves dealing with data, information and knowledge. The definitions of these terms are not always agreed on by different members of staff. Within the field of healthcare, although knowledge is considered an effective tool for service delivery (Bali and Dwivedi, 2007), the overall management of knowledge within the NHS and other health services remains a challenge. Agreement appears to be lacking regarding what knowledge is, which may have contributed to the marked differences existing between the knowledge management approaches. This research aims to expose such challenges as far as possible by focusing on the medical staff's understanding of the meaning of knowledge and the factors that could help, or otherwise, their acquisition and utilisation of such knowledge to help patients.

Knowledge management faces serious academic criticism mainly due to vagueness and inconsistency. Its position could benefit from an agreed definition of its basic terms, including knowledge itself. In the academic field, knowledge management has been criticised for being poorly understood (Tsoukas and Vladimirou, 2001):

> "*[Knowledge management] has weak theoretical grounds: ambiguous definitions, inconsistent interpretative frameworks of phenomena, and lack of a shared perspective in a field that is multidisciplinary in nature"* (Bolisani and Handzic, 2015, p.vii).

Wilson (2002) argued that knowledge management is, in many aspects, similar to other management fads and fashions (such as downsizing, business process re-engineering, etc.), and is likely to face a similar fate. Wilson (2002) concluded that one of the major reasons why knowledge management struggles is its utopian character. Knowledge management (incorrectly) assumes that the human mind (where knowledge resides) can

be managed, downloaded or distributed. Moreover, according to Wilson (2002), the principle of knowledge sharing, one of the most frequently discussed concepts regarding managing knowledge by exchanging tacit knowledge, is illogical, because one should have no incentive to share what keeps one in one's job.

For a knowledge-intensive organisation such as the NHS, knowledge is everything and everything is knowledge. It is worth reducing the scope of this concept, so that it covers less and reveals more (Alvesson *et al.*, 2001). This research constitutes an attempt to explore how NHS professionals define or make sense of knowledge. This is the first step towards creating a tailored knowledge management model for the NHS. Knowledge management is currently facing practical and academic challenges; however, its important, complex, contested and sometimes elusive nature makes knowledge and its management not only an interesting but also a fertile subject for research.

**Methodology:**

Given the assumption that the phenomenon under investigation (making sense of the concept of knowing something) is embedded in people and related to their mental and social interaction with their surroundings (Wilson, 2002), an interpretative qualitative research approach was selected for this project, using the Grounded Theory (GT) method, as described by Urquhart (2013) and Charmaz (2014). These texts provide a detailed, practical and up-to-date description of GT which takes into consideration its constructivist turn (Morse *et al*., 2009). GT has been used to research topics related to knowledge and its management. Examples of this include: the information-seeking patterns of academics (Ellis, 1993; Ellis *et al*., 1993; Cole, 1997), electronic data interchange (Crook *et al*., 1998) and senior executives and IT (Seeley *et al*., 1997). GT has also been extensively used in healthcare research.

This project examines a psycho-cognitive process within humans (knowledge acquisition), which cannot be easily revealed by a questionnaire. Also, the process under investigation may not be apparent from people's behaviour in a way that can be recorded through participant observation within the timescale of this study. To ensure the availability of rich data, in-depth (intensive) qualitative interviews were selected for this project (Kvale and Brinkmann, 2009, p.116). The selection of the interviewees was important. A "good" qualitative study requires experienced, "knowledgeable" interviewees who reflect a variety of perspectives (Rubin and Rubin, 2005). In healthcare, specialized medics (Consultants) satisfy these criteria and have been selected for the interviews. A total of 12 interviews

were completed and the findings are presented in Chapter 5. Open codes were generated from the interviews. These were raised into selective codes and the final categories were related to each other to generate theory, a process known as theoretical coding (Urquhart, 2013, p.107). Quotes from the interviews are extensively used to ensure that the reader is connected directly with the meanings volunteered by the participants. The research was based in one NHS Trust.

**Research findings:**
Following a detailed coding process, the following final categories were identified:

1. Finding the drivers to acquire knowledge
2. Interacting with the sources of knowledge
3. Undergoing a process of knowledge acquisition
4. Contrasting one's knowledge with peers to gain confidence
5. Practising skills to obtain confidence
6. Gaining confidence as the final stage of knowledge acquisition

Gaining confidence, as the final stage of knowledge acquisition, was identified as the core category. A theoretical coding led to the construction of the following theory, which links all of the selective codes together:

Healthcare professionals, driven by particular motivating factors, utilise credible sources of knowledge, through a defined process, to compare and contrast their knowledge with their peers as well as seek their peers' approval of information and practice to gain confidence. Gaining such confidence will ensure knowledge. Professionals are knowledgeable on a particular matter if they feel confident in their knowledge and ability to use such knowledge. This process is not necessarily perfect. There are problems with a lack of motivating factors, unreliable sources and overconfidence or misplaced confidence which could lead to incorrect or inappropriate knowledge (with serious consequences).

The essence of this theory is that people can be aware of the existence of many things in life but do not necessarily consider themselves knowledgeable about such things or think that they can make use of such awareness. This awareness can become knowledge once people develop confidence in what they are aware of and how such awareness can be used. Confidence transforms awareness into knowledge. Such confidence can be obtained through the approval and agreement of relevant others, usually credible peers,

by the direct practising of skills and/or using information to obtain feedback that helps to build confidence. According to the conclusions of this research, confidence is not only an essential feature of knowledge but also a sufficient criterion for its existence. The emergent theory argues that knowledge, in fact, constitutes our *confidence* in what we know or what we can do. One knows something or how to do something if one thinks *confidently* that one knows it or knows how to do it. Someone who understands a subject very well or has the ability to complete a task successfully but lacks confidence simply does not know that subject. On the other hand, people can be overconfident or have completely unjustified, misplaced confidence in situations where they lack understanding or ability. According to the emergent theory, they are still knowledgeable, albeit in an incorrect or negative way.

**Discussion:**

Chapter 6 examines the constructed theory of knowledge in light of the existing literature. The argument in this chapter is that the findings of this research, particularly the concept of confidence as an integral part of our knowledge and so building confidence is what makes us know, are implied in the majority of the knowledge-related literature. Also knowledge and its management are equally implied in the majority of confidence-related publications and experiments. However, the links between confidence and human knowledge have never been adequately developed in any of this literature. The research findings provide new meanings for knowledge which can be used to understand the existing literature in a different light. Moreover, this chapter explains how some of the current knowledge-based problems within the NHS can be approached in light of the new insights provided by this research. I used the theory's explanatory power to understand such problems. These are issues with groupthink situations, usually related to strong peers, and the related work of Kuhn (1977, 1996), as well as the phenomenon of harmful, misleading 'experts', mostly related to weak peers. The conclusion of this chapter is that the emergent theory, with its focus on understanding knowledge as confidence, overlaps significantly with the existing theories in the fields of psychology and philosophy, particularly Bandura's concept of self-efficacy (2001, 2002) and Williamson's (2000) idea of knowledge as a mental state. The emergent theory provides explanations of known problems within the knowledge management and decision-making processes, such as groupthink and social influence, as well as some problematic, misleading medical experts.

**Contribution to Knowledge:**

This research provided an alternative understanding of knowledge as emotion (i.e. confidence) rather than a cognitive ability to process objective knowledge items (Hislop et al., 2018, Chapter 2) or human behaviour that shapes our practice (ibid., Chapter 3). The search for knowledge so far takes place in the logical mind or purposeful behaviour of humans. However, the emergent theory points to human emotion as a source of knowledge. This theoretical contribution to knowledge was used to construct a practical tool for medical knowledge management within the NHS (Chapter 7). This tool is based on the continuous adjustment of staff confidence through the provision of timely, accurate feedback based on their patients' outcomes.

# Chapter 2
# Literature review

## 2.1 Introduction:

The concept of knowledge has been a rich field of enquiry since the times of the early Greek philosophers (Nagel, 2014; Plato, 1992). The importance of knowledge to business was realised shortly after the intensification of the competition between firms to produce high quality products (Drucker, 1992; Bell, 1973; Chakravarthy *et al.,* 2003). However, 'knowledge management' in the context of business administration is a term which was only introduced after 1986 (Wilson, 2002, Dalkir, 2017). Healthcare, in most developed societies, is now a service that is growing vastly in terms of its size and complexity. Few would disagree that successful healthcare is fundamentally based on the knowledge of continuously and meticulously trained staff (Bali *et al.,* 2007). However, knowledge can be an elusive concept, as most philosophers would agree, and its management is a much-contested field in business studies (Wilson, 2002; Bolisani & Handzic, 2015). Being important, complex, contested and at times elusive (see section 2.8) makes knowledge and its management not only an interesting but also a fertile subject for research.

This chapter reviews the relevance of knowledge and its management to the contemporary firm (section 2.2) as well as to healthcare services, particularly the National Health Service (NHS) (section 2.3). The different, varying models of KM are then discussed (section 2.4) with the conclusion that such variations can seem overwhelming to knowledge managers. The views of the ancient philosophers, mainly Aristotle, are discussed (section 2.5), followed by an analysis of contemporary perspectives on the meanings of knowledge (section 2.6). The relevance of these views to medical practice is discussed to show why both the ancient and contemporary perspectives have struggled to provide the perfect solution to the management of healthcare knowledge. The limitations of the communities of practice approach as a tool for managing knowledge is critically explored (section 2.7). The problematic nature of knowledge and its management in both academia and business administration, particularly the lack of a consistent or all-encompassing but useful definition of knowledge, are debated (section 2.8), which forms the case for the research focus of this project (section 2.9).

## 2.2 The importance of KM for the contemporary firm:

Issues related to knowledge are becoming increasingly central to the management of most organizations (Dalkir, 2011, p.2). Contemporary organisations are faced with continuously changing external and internal environments. Managing these changes to achieve the organisation's strategic goals is a requirement for business survival (Drucker, 1992). The recent developments in communications brought about by globalization, as well as the rapid improvements in computer technology, have more significant implications for organisations and businesses than anything else in recent history (Beitler, 2006). Organisations are required continuously to evolve in order to keep pace with the match changes (Hamel *et al.*, 1994). The ability to learn is probably one of the most significant memes[1] that may facilitate this evolution (Shaw and Price, 1998). In his "Towards a knowledge-based theory of the firm", Grant (1996) argued that knowledge is the most strategic asset of the organisation. Drucker predicted the growing importance of knowledge in business and the dawn of the knowledge economy:

> *"From now on the key is knowledge. The world is becoming not labor intensive, not materials intensive, not energy intensive, but knowledge intensive"* (Drucker, 1992, p.267)

Despite the fact that knowledge has been debated for thousands of years, knowledge management, as a business tool, is a more modern business concept. The foundations of knowledge management lie in Daniel Bell's work on post-industrial society (Bell, 1973; Hislop, 2013).[2] In his famous book "The Coming of Post-Industrial Society", he explained his vision of the kind of societies that would prevail after the mid-1970s. Bell classified societies based on the most common type of employment they offer. Industrial societies are based on manufacturing while post-industrial societies are based on the growth of the service sector. New societies, according to Bell, are characterised by the growth of knowledge-intensive types of businesses which replace manufacturing and agricultural industries as the main source of wealth. Post-industrial society, according to this vision, is characterised by a service-based economy, high knowledge intensity of social life and the growth of abstract and theoretical knowledge about work (Bell, 1973; Webster, 1996). Bell argued that knowledge and information are far more critical to service-providing firms than

[1] A meme to an organisation is similar to a gene to a living organism. It is a skill, concept, or behaviour that can give an organisation a survival advantage. It was first described by Richard Dawkins in his book 'The Selfish Gene' (1989, 2 ed., p. 192, Oxford University Press).

[2] Although Bell predicted the growth of knowledge-based work, he did not use the term "knowledge management"; which emerged after 1986 (Wilson, 2002)

to industrial companies; hence the importance of knowledge and information to the developing societies at the end of the 20th century (Hislop, 2013).

Bell (1973) divided knowledge into theoretical and technical types. Theoretical knowledge is abstract, captures thoughts and principles and, according to Bell, is of most importance to the firm. Technical knowledge is about how things are done. The classification of knowledge into technical and theoretical types is similar to what other writers described at a later stage as 'know-how' (technical), 'know-why' (theoretical), 'know-who' and 'know-what' (Roberts, 2015). These differences in meanings and classifications may have made knowledge management more complex than it would otherwise appear. Users of knowledge may have accorded different levels of significance to different types of knowledge. To manage knowledge within the NHS, we need to define it because knowledge means different things to different people (Dalkir, 2011), and this argument underpins the research question of this project, which explores the medical staff's understanding of the meaning of knowledge in their specific field or practice.

In the years following the publication of Bell's work, several studies supported his prediction regarding post-industrial society and its associated knowledge utilisation (Castells, 1998; KPMG Consulting, 2000; Kumar, 1995). Several surveys and research projects have shown that jobs have become more skilful and require increased levels of knowledge and information (Gallie *et al.,* 1998; Felstead *et al.,* 2000; NSTF 2000). The relevance of Bell's work to this research arises from the fact that the NHS is a service-based enterprise.

The increase in managerial and professional jobs is also accompanied by an increase in low-skilled service jobs (Thompson *et al.*, 2001). The utilisation of knowledge by modern businesses is likely to increase, and such an increase may be more noticeable in certain parts of the business than others. Healthcare services, including the NHS, are no different to the enterprises that followed Bell's predictions. Also, not all jobs within the NHS are knowledge-based. There is a growth in admin and other skilled jobs, such as radiographers and physiotherapists, who are highly trained but do not use or manipulate knowledge on a daily basis (unlike diagnosing a rare disease or planning treatment for a resistant tumour). Bell's work, as well as the associated criticism of it, can shed light on how knowledge flows within the NHS.

It is reasonable to conclude that the literature has provided evidence that the concept of knowledge management is not only vital to the contemporary organization, but also has been implemented widely and, on occasion, successfully. However, one must be aware of reporting and publication biases, where only the results of positive and successful projects are published, leaving failures and problematic projects outside the scope of assessment. Criticism of knowledge management as a concept and as a business administration tool has been openly voiced (Wilson, 2002).

Academically, knowledge management-related publications started to gain momentum in the early 1990's, reaching a peak in 1999 (Scarbrough *et al.*, 2001; Scarbrough and Swan, 2003; Wilson, 2002). This literature covered three main themes (Scarbrough and Swan, 2003). These are: the role of knowledge management in business performance, (Scarbrough and Swan, 2003; Mckern, 1996; Skyrme and Amidon, 1998), ways to capture knowledge as a strategic resource (Roos and von Krogh, 1996; Scarbrough and Swan, 2003) and, finally, the process of codifying, storing and sharing knowledge. Some of these publications run into the problem of reducing knowledge management to a narrow field of the technical implementation of IT systems and data mining (Finerty, 1997; Leonard-Barton, 1998; Scarbrough and Swan, 2003). The criticism of knowledge management as an academic field of study and as a tool for managing businesses is very strong and can appear convincing. Wilson's (2002) paper, "The nonsense of knowledge management", is an example of this. The challenges facing the concept of knowledge management will be discussed in section 2.8 below, which will show that, in the field of knowledge management, there exist more questions than answers. Most critically, the KM literature does not agree on a consistent understanding of the meaning of knowledge.

### 2.3 The importance of KM for healthcare services:

Healthcare is a knowledge industry (Greaves *et al.,* 2010) and so knowledge management is particularly important to services such as the NHS in the UK. The NHS is based on the delivery of highly skilled services, which requires continuous and robust knowledge updating, not only to provide high quality medical care but also to avoid committing clinical errors and causing harm to patients (Waring *et al.,* 2009). The following discussion will cover three points, explaining the need for robust knowledge management in healthcare services. These are: the avoidance of epistemic differences, issues related to IT systems and information overload and, finally, committing medical errors and causing harm to patients. This will be followed by a discussion of three major recent knowledge-related projects that have been implemented widely in the NHS: Information for Health

(Department of Health, 1998a); the establishment of the National Institute of Clinical Excellence (Department of Health, 1998b); and the adoption of knowledge sharing through clinical networks (Department of Health, 1995). The discussion below argues for the relevance of knowledge management to healthcare services as well as showing the limitations and shortfalls. The examples discussed from NHS practice link the literature review with the field of this research, i.e., the NHS.

**Knowledge management and epistemic differences**: a driver to examining knowledge processes in healthcare is to acknowledge what are known as epistemic differences between staff (Brown & Duguid *et al.,* 2001). Brown and Duguid argued that, within an organisation, the differences in practice can lead the staff to produce different types of knowledge as well as adopt different understandings of existing knowledge. This *"creates epistemic differences among the communities within a firm"* (p.198). Understanding different epistemological perspectives in knowledge management is important to the NHS to ensure that this organisation, which is largely knowledge-based, is able to capture, disseminate and update all types of knowledge relevant to its practice. The NHS needs to be aware of the epistemological differences between the different groups of staff working for it. The NHS is a large, multi-site organisation. There are different groups of people from different backgrounds who have different attitudes to different types of theoretical knowledge, as well as practical courses of action. Different groups of staff within healthcare services, such as medics, nurses, managers, IT consultants and accountants, have different backgrounds and may well adopt different epistemological stands with regard to knowledge and its management. This can be a source of 'epistemic difference' (Brown *et al.,* 2001), which could lead to communication and interaction difficulties arising between different groups of staff. For example, the term 'patient safety' could mean the avoidance of falls or incorrect medication (to nurses), the avoidance of the long-term complications of diseases (to medics), the avoidance of shortages of services (to accountants and managers), and the avoidance of patient misidentification (to IT staff). A group of staff from different backgrounds may have different approaches to and different understandings (epistemic differences) of the same concept of safety, which may lead to misunderstandings, miscommunication, disagreements and so, ultimately, delays in decision-making and the implementation of plans. This further supports the importance of studying knowledge management in healthcare services.

**Knowledge management and information technologies:** healthcare activities produce large amounts of data. These data are usually transformed into information and published

in the form of statistics, reports and research papers. The process of transforming information into knowledge seems to be critical, and the understanding of such a process will depend on what is meant by knowledge. The differences between data, information and knowledge (Davenport & Prusak, 1998) are also relevant here and the lack of an agreed definition of knowledge management has been highlighted as a source of concern (Dwivedi *et al.,* 2007; Beckman, 1999). Interestingly, in some healthcare discourses, especially those that are heavily influenced by computer systems, information is considered as a more general term that encompasses data and knowledge, so information has been defined as *"the data and knowledge that intelligent systems (human and artificial) use to support their decisions*" (Wyatt & Sullivan, 2006, p.566). This is an unusual approach, as knowledge is usually considered to encompass both data and information (Hislop, 2018). This, however, represents an epistemic difference between IT specialists and other knowledge focused groups.

Information technologies have a very noticeable impact on healthcare. The ease of accessing health information has caused information overload and, at times, paradoxical or unclear information is obtained which could adversely affect the staff's ability to diagnose and treat patients (Dwivedi *et al.,* 2007). Several initiatives were introduced to control such overload, which, however, were not successful (Melvin *et al.,* 1999). This is mainly because the information explosion, the ease of communication and the human way of searching for and disrupting information are not easily controllable factors (Dwivedi *et al.* 2007; Shenk, 1997; Wilson 2001). This prompted several writers to argue for the need to incorporate new knowledge management paradigms into healthcare (Mercer, 2001; Health Canada, 2001; Sharma *et al.,* 2004; Desouza, 2004). Information, knowledge and their interactions are not always good or prudent. Knowledge can be overwhelming, disruptive and sometimes misleading (Dwivedi *et al.,* 2007; Price, 1986; Shaughnessy *et al.,* 1999; Shenk, 1997; Waddington, 1997; Wilson, 2001), such as the publication of immature research findings that could confuse the standard practice. Hence, researching healthcare information and subsequent knowledge is critical to the NHS.

**Knowledge management and medical errors:** one may argue that, given the nature of their work, healthcare services such as the NHS need more effective knowledge management than other organisations and are more likely to face problems than, for

example, a small building firm. The NHS is based on the delivery of highly skilled services, which require continuous and robust knowledge updating, not only to provide high quality medical care, but also to avoid committing clinical errors and causing harm to patients (Bali and Dwivedi, 2007; Vincent, 2010).

The risk of harm to patients, inadvertently brought about by healthcare, has been recognised since the early days of the profession. Among the shibboleths of traditional medical ethics is the injunction “Primum non nocere”- “first (or above all), do no harm” (Gillon, 1985). However, a publication by Brennan *et al.* (1991) brought the extent of this problem to the attention of the public as well as the healthcare providers. In this study, also known as the Harvard Medical Practice Study, 30,000 randomly selected medical records from several hospitals in New York State were analysed for adverse events, which were defined as death, disability or extended hospitalisation as complications of receiving some sort of healthcare service. The results of this study showed that 3.7% of admissions were affected by adverse events, 58% of which were preventable. The high rate of adverse events reported in this study was confirmed by subsequent studies (Baker *et al.*, 2004; Davis *et al.*, 2002; Gawande *et al.*, 1992; Vincent *et al.*, 2001; Wilson *et al.*, 1995). The most common adverse events were related to the use of medication, followed by preventable infections, surgical and diagnostic mistakes and problems with medical equipment. Medical staff are knowledge workers and their mistakes are mainly knowledge-based (see Reason 1990), and so require an adequate knowledge management system.

An interesting project set up by the Blood Transfusion Service (NHS Blood and Transplant) in the UK is the Serious Hazard of Blood Transfusion (SHOT) scheme (www.shotuk.org). This scheme encourages hospitals to report incidents related to blood transfusion. These incidents are analysed periodically with the aim of informing practice for safer blood transfusion. The SHOT scheme started in 1996, and surprisingly the most common type of incidents are errors (as opposed to non-preventable pathological reactions to blood transfusions). The 2015 annual SHOT report showed that 78% of reported incidents were due to errors. What is surprising is that, over the years, there has been no reduction in the frequency of this type of error, and human error remains the most common risk associated with transfusion. The recommendations of the SHOT reports have always included an emphasis on staff training at various levels. This example show that the NHS is not, at least with regard to blood transfusion, a learning organisation.

Human error can be of four types (Reason, 1990). These include: *slips*, usually due to a distraction during a routine task; *lapses*, i.e. the failure to follow standard protocols or guidance, probably due to the complexity of situations and difficulty in implementing such protocols or guidance; *mistakes*, i.e. failures of judgment due to a lack of sufficient knowledge; and *violations,* which are a deliberate attempt not to follow the accepted approaches. Although Reason (1990) linked only mistakes to a lack of factual and scientific knowledge, the other types of errors (particularly slips and lapses) are also related to a lack of some other form of knowledge, such as knowledge of the importance of focusing on tasks, the need to avoid distraction and knowledge of one's limitations and the need to request help when required. These types of knowledge are harder to define than factual and scientific knowledge. This 'know how' rather than 'know what' is tacit rather than explicit knowledge (Nonaka *et al.*, 1995). It appears that the way in which knowledge is defined influences the understanding of the root causes of errors, and eventually will influence the method chosen to manage these errors. This brings the definition of knowledge to the centre of the discussion as an important step toward a successful knowledge management plan, and this is the research question of this project.

It is reasonable to accept that healthcare services are prone to errors. These errors are, on many occasions, indefensible and mainly originate from human action and omission, which are influenced to a great extent by human knowledge. Healthcare services are required to consider their knowledge management approaches with care; such approaches should be well planned and explicitly validated to ensure efficiency. Several initiatives for managing knowledge within the NHS have been implemented, with variable outcomes. Three examples will be discussed below and these include: Information for Health, the National Institute of Clinical Excellence (NICE) and the establishment of clinical networks.

The explicit management of NHS information was introduced by the 1998 white paper: "*Information for Health*: *an Information strategy for the modern NHS*" (Department of Health, 1998a). This paper outlined the importance of interpreting and meeting the information needs of patients, health care professionals, policy makers and managers, in order better to target and use the resources deployed in the NHS and improve the quality of life of patients and the local communities (Fairbrother, 2000). When he addressed the All Our Tomorrows conference at Earls Court on 2 July 1998, the British Prime Minister said: "The challenge for the NHS is to harness the information revolution and use it to

benefit patients". *Information for Health* provides the basis for the NHS to rise to that challenge (Department of Health, 1998a).

*Information for Health* aimed to deliver the following:

- lifelong Electronic Health Records for every person in the country
- round-the-clock online access to patient records and support on best clinical practice, for all NHS clinicians
- a National Electronic Library for Health to keep doctors, nurses and other clinical professionals up to date with the latest clinical research and best practice whenever they need to access it
- integrated care for patients through GPs, hospitals and community services sharing information across the NHS information highway
- fast and convenient public access to information, advice and care through online information services and telemedicine
- more effective use of NHS resources by providing NHS planners and managers with the information they need

An important observation here is that this approach was highly technical in nature. It was based on utilising the newly-evolving electronic advancements to gather and distribute information. The persistent use of the term "information", rather than "knowledge" in this white paper may reflect the strategy makers' awareness of the ambiguity surrounding the definition of knowledge and they aimed for better information management instead. The implementation of this strategy was funded centrally. Local Health Authorities were involved in its implementation; however, this was according to rigid rules. Although the 'Information for health' white paper lead to the greater utilisation of IT systems within the NHS, it did not achieve all of its goals, particularly those related to robust access to online patient records.

Another approach to managing knowledge in the NHS was based on the concept of evidence-based medicine (EBM) and the subsequent establishment of the National Institute of Clinical Excellence (NICE). EBM is the process of applying the best available evidence to medical decision-making, with regard to both diagnosis and treatment (Sackett *et al.*, 1996). This should eliminate sub-standard care and practice, which are due to a lack of knowledge, prejudice, personal preference, etc. However, EBM is not a straightforward concept. This is because evidence is not a concrete, noncontroversial entity that everyone accepts and agrees to use. Evidence comes in grades and its interpretation and use are

subject to social construction (Collins *et al.*, 1994; Johnson *et al.*, 2000). One may argue that evidence is knowledge, and the UK government established NICE in an attempt to manage the NHS's knowledge.

> *"NICE will produce clear guidance for clinicians about which treatment works best for which patients. It will assess new drugs, treatment and devices for their clinical and cost-effectiveness. It will mean looking, for example, at whether new medicines could replace existing products or reduce the need for complicated surgery*" (Department of Health, 1998b, point 1.15).

NICE is an independent organisation that is responsible for providing national guidance on the promotion of good health and the prevention and treatment of ill health (www.nice.org.uk). NICE guidance is developed using the expertise of the NHS and the wider healthcare community. NICE produces guidance in three areas of health: public health, health technologies and, most relevant to our discussion, clinical practice (www.nice.org.uk). The idea is that NICE appraises the evidence and provides practitioners with guidance that ensures safe, efficient practice. However, NICE has faced fierce criticism. Charlton writes as follows on NICE and the related CHI (Commission for Health Improvement):

> *"NICE and CHI are part of the executive arm of Government, performing roles established by statute. NICE and CHI are near the apex of a top-down managerial hierarchy in which the upper echelons audit and control the lower ones...Power to judge scientific theories in NICE and CHI is centralised and concentrated in the hands of the few who give orders to be acted upon by the many. The personal motivation driving the system of arbitration comprises the usual incentives of officials working in a bureaucratic structure...NICE redefines 'science' as being whatever the outcomes of its deliberations are" (Charlton, 2000, page 17).*

It seems that the idea of NICE is struggling to manage the people factor within the concept of knowledge management. It was based on managing explicit knowledge to achieve standardisation, but ignored the subjectivity of some of the decision-making processes and the necessity, at times, to craft a decision to help a particular patient or situation. NICE provides a "one size fits all" type of guidance. There are strong views that, while NICE claims that it is enabling excellence, it is also imposing control (Miles *et al.*, 2000). Understanding staff interaction with the sources of information, such as NICE, could help us to understand the meaning of knowledge in the context of healthcare.

Another aspect of knowledge management within the NHS is represented in the general strategy of this organisation to encourage knowledge sharing through teamwork and the

establishment of clinical networks. Spender (1996) argued for collective knowledge, in which tacit knowledge is shared within a social group. Hecker (2012) further developed this idea. An example of such networks is the reorganisation of cancer treatment into the cancer network (Department of Health, 1995). Whereas, previously, individual consultants and doctors led small teams of assistants and trainees, the development of clinical governance has promoted the development of bigger teams with broader remits and less dominance of the individual (Carter *et al.,* 2003). The quality of the healthcare provided by teams is superior to that provided by individual clinicians (Borrill *et al.*, 2000; Firth-Cozens, 2000) and clinical experience with multi-disciplinary teams (MDTs) has demonstrated positive aspects as well as the emergence of new concerns. An MDT is a management tool that is used by the NHS to manage its knowledge. It facilitates knowledge sharing, an influential concept in the objectivist KM literature, and resembles a community of practice (apart from the fact that a community of practice is an informal voluntary group). Discussing the advantages and disadvantages of MDTs helps us to understand the flow of knowledge within the NHS.

On the positive side, it was felt that patients treated within an MDT attained a sense of confidence that their treatment was being considered by a group of experts rather than a single clinician. Patients receive continuity of good care that is not dependent on the presence or absence of certain individuals. MDTs also provide clinicians with professional and psychological support during the decision-making process, improve the communication between the individual members of the team and enhance the sharing of knowledge, so clinicians learn without reading journals (Carter *et al.,* 2003)! MDTs represent one of the ways used within the NHS to manage knowledge.

Important concerns have also been raised with regard to MDTs. These involve the power struggles within the team, as well as between teams and other functions of the NHS. As the MDTs mature, their sense of frustration with the current hierarchal structure of NHS management grows (Carter *et al.*, 2003, NHS England, 2015). This is complicated by confusion about the exact boundaries of the team and the need for exceptionally capable leadership to maintain the work of such teams. The latter can prove problematic in the presence of a high turnover of team members. Also, teamwork and team development require considerable staff time to be allocated to these activities (Carter *et al.*, 2003). This is becoming more difficult due to the current financial pressure. Networking and the associated influence of peers were considered during this project and the participants' views on these subjects shaped the final theory of this research.

In conclusion, the management of healthcare involves dealing with data, information and knowledge. The definitions of these terms are not always agreed between staff. Within healthcare, knowledge is an effective tool of service delivery; however, knowledge overload can be a hindrance. There are several initiatives within the NHS that were designed to manage knowledge. None of them were explicitly labelled as a knowledge management project. These initiatives focus on the technical distribution of information (e.g. Electronic Health Records & National Electronic Library), the sharing of knowledge between experts (e.g. MDTs) and ensuring the utilisation of the available information/knowledge for clinical decision-making (e.g. NICE). Most, if not all, of these initiatives are characterised by being rigid and involve a great deal of control over staff. The overall management of knowledge within the NHS and other health services remains a challenge. This research aims to expose such challenges as far as possible, and will focus on the medical staff's understanding of the meaning of knowledge as well as the factors that could promote, or otherwise, their acquisition of such knowledge and its utilisation to help patients. The diversity of approaches used by the NHS to manage its knowledge is a reflection of the wide variation in management models used in other businesses and services besides healthcare. The next section examines some of the proposed models for knowledge management delivery as discussed in the business administration literature and raises the concern about having many options without any guidance on how to select the most suitable course of action.

### 2.4 Different models of KM: rich diversity or bad confusion:

Differences in the understanding of the concept of knowledge have led to various strategies that can be used to manage knowledge within organisations. Hislop (2013) and Dalkir (2011) provided two different analyses of the literature with regards to the practice of knowledge management. These two analyses do not overlap and none of the studies and papers examined in one analysis was mentioned or indexed in the other. The lack of an overlap between these two analyses reflects the extreme variations in practice, proposed models and overall thinking regarding knowledge management. The argument in this section is that the approaches to knowledge management vary dramatically. Such approaches involve managing different aspects of organisational life, e.g., controlling data and information, facilitating relationships between people or adjusting a process. The knowledge management approaches manage different things because of the inconsistency between the various definitions of knowledge. This inconsistency is the focus of the research question of this study. Knowledge is different in different situations

and to different practitioners. This makes it difficult to choose an approach, extrapolate from others' experience or assess the success of an approach (see section 2.2.8). This is why the NHS, a mature knowledge-based organisation, is still debating how it can manage its knowledge (NHS England, 2016). Hislop and Dalkir's analyses will now be summarised to explain these views further. This is followed by a discussion of some of the difficulties associated with engaging with this literature and the implications of these for the NHS.

Hislop (2013, chapter 4) discussed three key papers on the subject (Hansen *et al.*, 1999; Earl, 2001; Alvesson *et al.*, 2001). Firstly, Hansen *et al.* (1999) identified two different knowledge management strategies: codification and personalisation. In the codification strategy, knowledge is carefully codified and stored in a database, where it can be accessed and used easily by all. Codification is implemented using a people-to-document approach. In the personalisation strategy, knowledge is closely tied to the person who develops it and shared mainly through direct person-to-person contact. Hansen *et al.* (1999) argued that a successful firm should concentrate on a single strategy and not attempt to use both approaches equally. It is argued that an organisation's knowledge management strategy should reflect its competitive strategy and how it creates value for customers. In the first model, Hansen *et al.*, are managing objective data while, in the second model, they are managing interactions between humans. Hansen *et al.* (1999) did not explicitly define knowledge.

Secondly, Earl (2001) provided a taxonomy of the knowledge management approaches which reflects a far wider variation than Hansen *et al.*'s approach. This taxonomy provides a description of three approaches of knowledge management. These are: the technocratic approach, the economic approach and the behavioural approach, within which three approaches there is a total of seven schools of thought. In this taxonomy, Earl (2001) provided a methodology for linking business strategy to one of these knowledge management schools. This implies that organisations select one (or several related) knowledge management schools, based on what the organisation wishes to achieve, i.e. its strategy. Earl (2001) seems to have used the relation to IT as a reference point for his classification, with some approaches firmly based on rigid IT control (e.g., a systems school) and others far from being that (e.g., the strategic school). Earl's classification can be considered an approach to understanding organisational life in general, not specific to knowledge. It could be a classification of the general management of an organisation in the digital age. Similarly to Hansen *et al.*, Earl did not attempt to define knowledge.

Alvesson *et al.* (2001) provided four distinctive orientations of knowledge management that are prevalent in both business theory and practice. These four orientations were arranged along two dimensions: the *medium of interaction* and the *mode of managerial intervention.* The *medium of interaction* can be social interaction, where the management targets the minds of employees through norms, emotion, beliefs and values, or techno-structural interaction, where the management targets behaviour by designing and supervising work processes that minimise the effort and skill necessary for the worker to carry out his/her work. The *mode of managerial intervention* could be co-ordination - weak management in the form of minimal activities needed to orchestrate collective action - or control - strong management including an apparatus for specifying, monitoring and evaluating individual and collective action. This makes it possible to produce a matrix (Fig 1) of the four orientations to knowledge management.

| | Managerial Control | Managerial Co-ordination |
|---|---|---|
| Social interaction | Community (Sharing Ideas) | Normative Control (prescribed interpretations) |
| Techno structural Interaction | Extended Library (information exchange) | Enacted blueprints (templates for action) |

Fig 1: A typology of the knowledge management approaches (Alvesson *et al.,* 2001)

Hislop's (2013, chapter 4) description of three key publications on the approaches to knowledge management showed the diversity of such approaches and their difference in emphasis. This makes the selection of an approach for a particular firm and a comparison of the efficiency of these approaches difficult. This confusing variation is highlighted further by Dalkir's review of the KM models.

Dalkir (2011) provided a different approach to understanding knowledge, by suggesting that the literature on knowledge management can be understood in terms of knowledge models that provide frameworks for knowledge management practices. Although these

models overlap at times, each approach has a different emphasis. This variation could be considered a strength in the discipline of KM. Variation allows more options with regard to management style to cater for different organisational needs. On the other hand, variation may indicate vagueness and inconsistency. Dalkir selected eight models because they seemed sufficiently comprehensive, have been implemented in practice and have received adequate criticism in the KM literature (Dalkir, 2011). These models and their foci are summarised in the following table:

| | Dalkir's selected model | The focus of the model |
|---|---|---|
| 1 | The organisational epistemology model of von Krogh and Roos (1995) | Individual knowledge and social knowledge differ. Social knowledge resides in the connections between people and, although it is a critical type of knowledge, it is harder to manage. |
| 2 | The Nonaka and Takeuchi Knowledge Spiral Model (Nonaka and Takeuchi, 1995) | This model emphasises the interaction between tacit and explicit knowledge and assigns critical importance to tacit knowledge |
| 3 | The Choo Sense-Making KM Model (Choo, 1998) | This is based on the interaction between three major concepts: sense-making (Weick, 2001), knowledge creation (Nonaka & Takeuchi, 1995) and decision-making (Simon, 1957). |
| 4 | The Wiig Model for Building and Using Knowledge (Wiig, 1993) | This is based on the principle that "in order for knowledge to be useful and valuable, it must be organised". Different methods of knowledge organisation should help different users of knowledge. |
| 5 | The Boisot I-Space KM Model (Boisot, 1988) | Boisot proposed managing pieces of information as 'goods', similar to physical assets. The development of a common 'work language' promotes knowledge sharing. |
| 6 | Complex Adaptive System Model (Bennet and Bennet, 2004; Snowden, 2000). | This model is based on the assumption that an organisation is an intelligent, complex, adaptive system. Instead of tacit and explicit knowledge, this model proposes classifying knowledge into known, knowable, complex and chaotic types. |
| 7 | The European Foundation for Quality Management KM Model (Bhatt, 2000, 2001, 2002) | This uses the existing management tools within an organisation, such as the leadership, strategy and human resource management, to ensure that |

| | | |
|---|---|---|
| | | the knowledge is managed to achieve the organisational goals |
| 8 | The Inukshuk Model (Girard, 2005) | This model identified five enablers for managing knowledge. These are: the measurement, process, leadership, technology and culture. |

Dalkir's models are variable but some of them share common themes. These include: a focus on the personal and social nature of knowledge (model 1 & 2). Knowledge is no longer mere data and information contained on spreadsheets, but it remains unclear what it is. The other theme is the reliance on the existing management tools and concepts within the organisation to manage knowledge (models 7 & 8). These tools include leadership, the use of technology, strategy, etc. The view is that managing other aspects of the organisation well will also solve the knowledge issue.

Dalkir (2013) and Hislop (2013) found the different models and strategies for knowledge management helpful in providing the theoretical underpinning of the field and practical guidance on what should be done. However, a few problems persist:

- Firstly, these views collectively provide a very wide, extremely extended spectrum of the knowledge management methods, that range from pure IT systems, that are used solely to distribute rigid types of data to a highly creative social entity that cannot meaningfully be measured, managed or defined. According to these views, within the organisational life, knowledge can be anything and so, within an organisation as large as the NHS, its management requires many (or limitless) knowledge management departments.

- Secondly, the selection of an appropriate method to manage the knowledge within an organisation depends on the overall strategy and goals of such an organisation. However, all of the activities within an organisation, for example human resource management (Noe et al., 2018, p.12), are directly influenced by the organisational strategy and goals, which makes this advice insufficiently specific for the NHS manager.

- Finally, many of these schools of thought suggest that an organisation should focus on one or only a very few strategies of knowledge management to ensure a focused

approach (e.g., Hansen et al., 1999; Earl, 2001). Given that different types of patients attend the NHS and the marked variations in their clinical needs, this is particularly problematic advice for the NHS.

The NHS, unlike smaller organisations, is designed to be both universal (providing healthcare of the same standard throughout the UK) and comprehensive (covering all health needs) (Talbot-Smith *et al.*, 2006). The NHS seems to be an integration of a number of many specialised organisations. It is hard to select one or two of these approaches (models/schools) to knowledge management that would suit the NHS. Each approach has something to offer in certain parts of the NHS. Again, the NHS's problem is not selecting an approach, but finding a strategy that allows the use of all of these approaches in different parts of the organisation, as well as allowing the different parts of the NHS to move between approaches over time to allow dynamic knowledge management.

Although both codification and personalisation are widely practised in the NHS, applying Hansen *et al*.'s (1999) rules to the NHS can prove problematic. The codification strategy seems to encourage the reuse of knowledge to achieve standardisation, whereas personalisation encourages innovation and creative thinking. The NHS is both large in size and has a wide spectrum of objectives and goals (Talbot-Smith *et al.*, 2006). It requires standardisation across its markedly extended practices as well as the robust use and reuse of codified knowledge to ensure consistent standards of care and eliminate clinical errors. On the other hand, the NHS cannot afford to stop innovating and finding creative solutions to its challenging clinical and business problems. Contrary to the conclusion of Hansen *et al.* (1999), the NHS requires both strategies to be implemented actively. The challenge facing the NHS executives is probably not which strategy to use but when and where each strategy should be implemented. This has implications regarding the IT system required by the organisation. As Hansen *et al.* (1999) explained, each strategy requires a different IT infrastructure, as well as a different level of support. Developing two IT systems, or a single, highly complex one, that serves both strategies is not an easy task, due to the cost implications (Keen, 2006).

Another problem with the approach of Hansen *et al.* (1999) is the need to strike a fine balance between standardised and customised services. While codification ensures standardisation, personalisation provides a customised service to NHS patients. The NHS's overall strategy, as outlined in the NHS constitution (Department of Health, 2009), emphasises the need to provide a customised service to patients, as well as setting a

minimum standard of care. Certain NHS practices, such as child vaccination programmes, are relatively mature products and can be managed well through codification. Other practices, such as treating difficult types of leukaemia, are still in the development stage. This type of treatment is rapidly changing in the light of scientific progress and may vary from patient to patient (Jameson & Longo, 2015; Yeung et al., 2013).[3] Each treatment is an innovative product and so codification cannot be applied in such clinical scenarios. Certain types of NHS staff, such as clerical and administrative workers, rely on explicit knowledge; others, such as leading experts in rapidly advancing fields of medicine, rely on tacit knowledge to solve problems. The business strategy and knowledge management style required by these groups of staff differ. Given its size, the NHS requires a codification strategy to eliminate errors and ensure high standards of care, but also a personalisation strategy to ensure innovation and the continuous development of new treatments. This places the NHS (like other large knowledge-based organisations) in need of a complex, versatile knowledge management strategy that is implemented in a dynamic manner. Hansen's approach explains the concepts around knowledge management very clearly but fails to provide sufficient theorising around how to ensure the balance between the codification and personalisation of knowledge in an organisation as large and diverse as the NHS.

Alvesson *et al.*'s (2001) concept of managing knowledge as *extended libraries* involves the extensive use of technology to create knowledge brokers (Davenport *et al.*, 1998). It also facilitates staff access to huge sources of knowledge, but with weak management control of such access. The NHS has already implemented such an approach and established a National Electronic Library for Health (Department of Health 1998a). However, this approach is problematic for the NHS for three reasons. First, the knowledge in the field of healthcare is vast and rapidly changing. The NHS encompasses all aspects of healthcare and this makes the proposed library massive and so hard to deliver and maintain. One way of overcoming this problem is to give NHS staff electronic access to the world-wide healthcare literature.[4] This leads to the second problem, which is the cost. Securing electronic access by all staff to all healthcare literature would be costly. The NHS would probably pay such costs if the results of such access could be objectively proven to improve healthcare quality or quantity. Knowledge management's cost-effectiveness has not yet been proven (Heisig *et al.*, 2016). Finally, staff interactions with massive knowledge

[3] See the Leukaemia Research Fund website, especially the publication section: www.lrf.org.uk.
[4] For example, the use of Athens, which is a secure login services that gives staff access to professional academic resources.

sources create issues concerning information overload and how to manage conflicting/immature evidence.

Managing knowledge as a *community* (Alvesson *et al.,* 2001) encourages staff to share tacit knowledge through soft management and by nurturing social relationships. The NHS application of such an approach is inconsistent. A recent assessment of knowledge management within the NHS has pointed out several shortfalls (NHS England, 2016). One successful example of this is the development of regional transfusion committees to encourage the sharing of good transfusion practice between hospitals (Department of Health, 2007). Knowledge sharing involves an element of altruism (Alvesson *et al.*, 2001). In the current state of the market-based-systems (Talbot-Smith *et al.*, 2006), it is hard to believe that altruism will flourish within healthcare services. There is a risk that the NHS trusts may behave like rival pharmaceutical companies, seeking to attract work rather than share knowledge. Another problem with this approach is that managing social relations and altruism can prove challenging:

> *"The managerial aspect of [knowledge management] is not too self-evident: creating an environment is not something that management can do on its own and it is definitely difficult to address in an instrumental way"* (Alvesson *et al.*, 2001).

Managing knowledge through *normative control* (Alvesson *et al.,* 2001) involves controlling the social culture and life within organisations to influence people's values and ideas. This rests on the principle that the correct values or interpretation will produce the correct line of action. However, it is very difficult to change the organisational culture (Schein, 1992, p.9). Although some success in managing corporate culture has been reported (Alvesson, 1995; Kunda, 1992), culture is difficult for the management to control. One particular problem with this approach for the NHS is that self-regulation by the medical profession through bodies and organisations outside the NHS has a major influence on the culture and social thinking of NHS staff. These bodies include the Royal College of Medicine, the General Medical Council and the Royal College of Nursing. The messages and moral values supported by these organisations are always respected by NHS professionals.

> *"Self-regulation by medical professions has been a long-standing tradition in the NHS...As statutory bodies they are responsible for defining standards of education, clinical performance and professional conduct"* (Talbot-Smith *et al.,* 2006, p. 121).

This external influence on the NHS's social values adds to the challenges related to knowledge management within the organisation. The NHS should communicate and

debate certain aspects of healthcare business delivery with these bodies to ensure that the NHS's strategic targets are achieved.

Managing knowledge by *Enacted Blueprints* (Alvesson *et al.,* 2001) engineers and controls individuals to comply more closely at the behavioural level rather than attempting to change their values or ideas. This approach provides templates and guidelines that produce the desired action, regardless of what individuals value or think. This looks like a robust implementation of the codification strategy of knowledge management (Hansen *et al.,* 1999), where knowledge is codified into the IT system and made available for use by all staff. This approach enables certain members of staff, who know very little about the subject, to perform complicated tasks. This may create power confusion. Staff may feel empowered because they know how to carry out tasks but are not necessarily very knowledgeable about them (Alvesson *et al.*, 2001). A drawback to this orientation is that the staff may be unable to deal with slight variations in their tasks. Each patient in the NHS is unique and may have unique health and social needs. Although standardisation will be ensured, a customised service will be lacking. What should a healthcare provider do if a patient has a problem that is not listed on the computer? This strict codification ignores the building of an important type of knowledge that is inexpressible, subjective, personal, context-specific and difficult to share, otherwise known as tacit knowledge (Hislop, 2013).

Given the nature of knowledge, the literature, as discussed, fails to provide an answer to the NHS and hence NHS Trusts across the UK lack knowledge management departments. Moreover, some models (e.g. Choo's (1998) sense-making model, the European Foundation model) use other existing business tools, such as strategy, leadership and human resource management. In these models, it would be hard to attribute the success (or failure) of a project to knowledge management alone. The contribution of knowledge management to the organisational outcomes will remain difficult to assess. Finally, none of these models have actually defined knowledge, and the majority of them approach knowledge as a wide spectrum, extending from codified data within an IT database to the cultural values held by individuals. This broad understanding of knowledge could explain why different approaches are used to manage it. These views were summarised by Wilson (albeit negatively):

> *"Knowledge management is an umbrella term for a variety of organisational activities, none of which are concerned with the management of knowledge"* (Wilson, 2002, p.1).

In conclusion, Hislop (2013) and Dalkir's (2011) analyses showed marked differences in terms of their proposals regarding knowledge management. Although one can see some overlap between some of these approaches, such an overlap has not yet helped knowledge management to develop unifying principles to establish a credible academic field or a useful tool of business administration. Different approaches remain a source of confusion, which has led to a lack of trust in knowledge management as a robust management discipline or credible field of research. These differences and variations in practice may have originated from a simple lack of agreement on what knowledge is. The next section briefly reviews the relevant philosophical roots of the meaning of knowledge.

### 2.5 Knowledge's roots in ancient philosophy: an old problem re-emerges

The nature of knowledge is an ancient field of philosophical enquiry. The tripartite approach to knowledge is an influential approach within epistemology. It featured in Plato's dialogue, Theaetetus. According to this approach, knowledge is justified true beliefs. There are many arguments for and counterarguments against each of the three components (being justified, true and belief) (Baggini & Southwell, 2012; Nagel, 2014; Plato, 1992). Using the tripartite account of knowledge to understand medical knowledge shows how fallible medical knowledge can be. The justification of medical knowledge is very common practice indeed. All medical research publications, clinical trials' outcomes and guidelines are attempts to justify certain types of knowledge. However, truth remains a problematic issue. Most medical experts would accept that what they know now may change in the future, and that what their current actions may be regarded as unsuitable or even wrong in the future. An example is the aetiology (and so the treatment) of peptic ulcers in the stomach. For many decades, it was thought that peptic ulcers were a result of an imbalance between stomach acid and its protective mucosa.[5] In 1985, Barry Marshall discovered that this disease is simply a bacterial infection and so requires treatment with antibiotics. He was awarded the Nobel Prize for Physiology or Medicine for this discovery, in 2005.[6] Viewing medical knowledge as a justified true belief entails making huge assumptions about the justification and truth of what medical staff believe, and hence this project has been designed to explore these issues further.

[5] The Merck Manual of Diagnosis and Therapy (Lyght C E et al, 1966, New York, MERCK & CO. Inc) attributed peptic ulcers to the hypersecretion of acid and psychic disturbances with increased emotional tension.

[6] See Nobel Prize website: https://www.nobelprize.org/nobel_prizes/medicine/laureates/2005/.

**Aristotle's phronesis: the wisdom behind practice**

Aristotle had an approach to knowledge that differed from that of others (e.g., Plato) and is more relevant to this thesis because of its pragmatic slant and detailed consideration of the practice-producing form of knowledge (phronesis). According to Aristotle, knowledge is of three types (Aristotle, 2004) and these are largely incommensurable. Although he accepted the existence and relevance of each type of knowledge, he ranked them according to their importance to human life, where episteme (theoretical knowledge that seeks to establish an understanding mostly about universal principles using analytical rationality) is ranked first. Techne (technical knowledge that lead to material creation or the making of products such as ships, cakes, paintings or herbal therapy using instrumental rationality) is ranked the lowest, because *"techne is little more than accumulated experience based on past making, transmitted to newcomers and articulated enough to be useful to further making. As such, in spite of his respect for great artists and artistic productions, a life of techne is not worth living"* (Nicolini, 2012: 27).

In between lies phronesis (a practical knowledge that shapes people's actions). Phronesis is concerned with human actions such as conducting business, engaging in politics or living an ethical life. An activity that is shaped and influenced by this type of wisdom is called praxis. Phronesis is based on the careful deliberation on our behaviour when engaging in politics or pursing an ethical life. Phronesis, the knowledge underlying ethical decisions, was the focus of Aristotle's "Nicomachean Ethics". However, phronesis was still considered '*inferior'* to the scientific wisdom of episteme (Aristotle, 2004: 162). According to Aristotle, phronesis is a virtue, so being knowledgeable (in a practical way) is a virtue similar to being honest, just or kind. In medical practice, one needs the 'knowledge' required to care for patients, as a lack of such knowledge can be damaging and considered an omission, carelessness or even recklessness, which explains the ethical dimension of practical knowledge.

Aristotle drew on medical practice to provide several examples in his "Nicomachean Ethics". However, although medical ethics, similar to other aspects of ethics, are a result of phronesis, it was unclear whether he was proposing that the medical practice of managing patients is a result of phronesis. On many occasions, he saw medicine as an art based on techne (and hence led to a life that was not worth living). He explained the need for a politician to possess wider knowledge about life, just as doctors need to have

knowledge about all parts of the body, and commented: “Indeed the statesman’s need is greater than the doctor’s, inasmuch as politics is a better and more honourable science than medicine” (Nicomachean Ethics, Aristotle, 2004: 28). Several contemporary writers supported this view. By arguing that a technical approach to medicine will emphasise medicine as an art and also enhance the use of new technologies (Hofmann, 2003) or that medicine aims at a goal, which is to cure patients and hence has a product, rather than focusing on the action, in this sense, a doctor appears similar to an artist or poet who produces a work of art or literature (Waring 2000). Others disagreed. MacIntry (1981) argued that the technical aspects of any practice cannot be separated from its ethical implications so, similarly to medical ethics, medical practice is the result of phronesis. Tyreman (2000) explained that the decision-making in current medicine is highly complex and requires engagement with various medical evidence to the extent that doctors must exercise a great deal of deliberation and judgement in order to devise a reasonable medical plan, which is the essence of phronesis. Moreover, modern medicine is not only concerned with curing patients. There are two other critical criteria related to professional practice: firstly, the process of achieving the cure is equally important. Doctors are not free to pursue whatever they think will help to cure patients. The process of achieving a cure is challenging and has a social component due to the involvement of the patients and their families i.e., doctors (like politicians) must follow a process rather than simply aim to achieve a product, such as involving patients in the decision-making, avoiding harming anyone and ensuring justice to all patients (Beauchamp & Childress, 2013). Secondly, a cure may not be possible and some terminally-ill patients require care that mainly focuses on the care process itself rather than an outcome. It is plausible to accept that modern medical practice is the result of the practical wisdom of phronesis (Kaldjian, 2010).

Of particular interest to this dissertation is the argument that phronesis itself is neither a clear nor a well-defined concept. For example, Aristotle himself thought that virtue, including phronesis, is an “inexact science” (Irwin, 2000) while Hursthouse (1999) indicated that it is uncodifiable. Within medical practice, Kotzee *et al.* (2016) criticise the work of writers in the field, as “*none explore the actual psychology and manifestation of phronesis in real doctors’ decision-making*” (p.341). Kotzee *et al.* go on to ask *“does phronesis seem to them [doctors] more like a form of thinking, theorizing, or deliberating that is like scientific thinking? Or does it seem more like making intuitive or emotional judgements? Is phronesis something that can be captured in words, or otherwise communicated in their experience,*

*or can it only be grasped by the individual in a moment of insight?"* (Kotzee et al., 2016, 342). Kotzee *et al.* do not provide an answer. These questions are consistent with the research question of this dissertation: what does it mean to know something? This project takes this discussion a step further and, as shown in the finding chapters, knowledge was seen as feeling confident about certain actions or plans.

The concept of phronesis has been found to be relevant and useful to many of the issues that have emerged from this research and will be discussed further in the discussion chapter. This includes the categories resources, process, practice, and finally adopting a particular mental state of confidence. However, some of Aristotle's views are hard to defend. This includes his moral classification of the types of knowledge, particularly his undermining of the contribution of art and craft to human life, and his argument that science such as chemistry, maths, etc., is theoretical and hence "*its goal is neither production nor action but simply truth*" (Barnes, 2000, page). Of greater concern to this thesis is his view that politics is "*a better and more honourable science than medicine*" (Nicomachean Ethics, Aristotle, 2004: 28). The difference between the current thinking and Aristotle's views are likely to reflect the social, economic and political life of the ancient Greeks (Nicolini, 2012, 28). This may explain why Aristotle's contribution to knowledge is rarely used by contemporary writers in the field of knowledge management, such as Hislop *et al.* (2018) and Dalkir (2011). However, Aristotle's practical wisdom has been debated over the centuries and found to be a useful concept. The next section discusses modern views on knowledge and its management.

### 2.6 Contemporary views of knowledge: the objectivist versus the practice-based point of view:

The contemporary knowledge management literature does not engage in a philosophical discussion regarding the nature of knowledge, while the major textbooks in the field (e.g., Hislop 2013, Hislop et al., 2018, Dalkir, 2011) make scant reference to the views of Plato and Aristotle or even Hume, Kant and Nietzsche. This is because a philosophical explanation of knowledge was seen as beyond their scope (Hislop *et al.* 2018:13) or, alternatively, contemporary writers resist the view that knowledge is relevant to management (Styhre, 2003). In this section, the two perspectives of knowledge, as debated in the contemporary knowledge management literature, will be discussed and

related to each other, plus examples of their use in healthcare will be described. These perspectives are the objectivist view and the practice-based view.

**The objectivist view of knowledge**

According to this view, knowledge is considered an object or entity that can exist independently of people in the form of books, manuals, compact discs, standard operating procedures, etc., and consists of largely "objectifiable transferrable commodities" (Hartmann & Doree, 2015, 342). In addition, knowledge tends to be objective (rather than subjective) and is consistent across people, cultures and time periods (McAdam McCreedy 2000), so it is 'scientific' and as such the language used by people to express knowledge is not considered problematic, within the positivist view of science (Hislop et al., 2018).

However, within the objectivist view, knowledge can be seen as the result of human intellectual activities and some knowledge is present in the human brain as a 'cognitive entity' (Cook & Brown 1999, 384). The presence of different types of knowledge is also accepted, particularly tacit (subjective, personal, context specific, difficult to code or share) knowledge and explicit (codifiable, objective, impersonal easy to share and context independent) knowledge (Hislop 2018). However, it considers codified explicit knowledge a superior form of knowledge. Moreover, this view accepts the presence of individual knowledge and group knowledge, with the latter existing in social groups as shared practices and routines (Hislop et al., 2018).

This view proved dominant in the knowledge management literature and supported the knowledge-based theory of the firm (Nonaka and Peltokorpi, 2006, Spender, 1996, Kogut and Zander,1996, Grant, 1995). Based on this description, this view adopts a management structure of knowledge that depends on two principles: transforming tacit knowledge into explicit knowledge and the sharing of explicit knowledge widely or appropriately (Hislop et al., 2018).

Within the NHS, many knowledge management initiatives have been directly based on this view. The British Government published a white paper entitled "Information for Health" (Department of Health 1998a), aimed at establishing electronic health records as well as a national electronic health library. The establishment of the National Institute of Clinical Excellence (Department of Health 1998b) aimed to standardise healthcare knowledge and

evidence-based practice. Finally, the establishment of cancer networks across the country ensured the sharing of knowledge (Department of Health 1995). These initiatives considered knowledge as a fairly manageable entity that can be influenced by IT systems, libraries or structured meetings.

However, this account of knowledge is problematic in several ways. Firstly, it struggles to cope with the human interaction with 'knowledge' i.e., whilst it accepts that knowledge can be separated from humans, it accepts that knowledge exists in human brains as a cognitive entity. There is an implicit contradiction in the background of some of its assumptions. In addition, its management structure is based on sharing and it assumes that humans are usually willing to share, an approach that ignores the complexity of human nature (Wilson, 2002), particularly the issues related to power and conflict that humans will bring to the process (Nicolini, 2007, 2011). Secondly, a limitation of this view is its assumption that explicit knowledge is superior to and more desirable than tacit knowledge, which is debatable. The knowledge that led Leonardo de Vinci to paint the Mona Lisa is largely tacit, and has not been matched by any explicit knowledge so far. The knowledge used by Steve Jobs to establish what is now one of the most profitable businesses in the world was mostly tacit (Lee, 2011, p.42). The fact that explicit knowledge is easier to manage does not mean that such knowledge is superior, more effective or more desirable.

The objectivist view of knowledge is practical and easy to understand (but not necessarily accepted). However, it would struggle to explain many types of knowledge and people's interactions with these types of knowledge. This is probably because "*it is based on flawed epistemological assumptions"* (Hislop 2018; 30). This has allowed the emergence of a different view of knowledge, based on practice.

**The practice-based view of knowledge**

According to this view, "*knowledge is embedded within and inseparable from work activities or practice"* (Hislop *et al.* 2018: 30). Writers, within this perspective, prefer to use 'knowing' rather than knowledge (Hislop *et al.* 2018:31) because *"knowledge is inherently tied to the pursuit of an activity and is constituted and renovated as actors engage with the organizational world in practice"* (Nicolini 2011: 604) and *"knowing is something that we do"* (Nicolini, 2011: 602). According to this view, *"it is impossible to totally disembody knowledge from people"* (Hislop et al., 2018: 35) because it "*assume[s] that knowledge*

*develops through practice, people knowledge develops as they conduct activities and gain experience*" (Hislop et al., 2018: 36).

Interestingly, knowledge (or knowing) is not seen as a purely cognitive process, as knowledge and doing are fused, and all other parts of the body, besides the brain, become equally important. All of the sense-making organs in the body contribute to knowledge building (Strati 2007, 67). A musician playing an instrument subconsciously is a form of knowledge practice but not necessarily one that is very cognitive in nature. A swimmer will probably do the same and this concept can be extrapolated to other knowledge workers, such as teachers and engineers. In healthcare, Hindmarsh and Pilnick (2007) studied anaesthesia staff, particularly the processes they used to move and handle anaesthetised patients. The anaesthesia staff developed significant shared knowledge on how to complete these tasks quickly and efficiently while working together, and this was achieved with little talking (and probably very little thinking).

Moreover, this view acknowledges the complexity of knowledge and rejects its simple classification into tacit vs explicit or individual vs group knowledge (Schultze and Stabell, 2004). According to this view, knowledge cannot be fully explicit or fully tacit (Polanyi, 1969; 195) nor fully individualistic or fully group knowledge and so "knowledge is multi-faceted and complex, being both situated and abstract, implicit and explicit, distributed and individual, physical and mental, developing and static, verbal and encoded" (Blackler 1995: 1032). There is always a tacit component to any obviously explicit knowledge, and vice versa. This thesis aims to explore what meanings medical staff give to the concept of knowledge and how such meanings relate to and compare with the existing views.

An important aspect of this school of thought is its acceptance of the social construction of knowledge which make knowledge a subjective concept, open to interpretation. Both the construction and interpretation of knowledge are culturally embodied. Compared with the objectivist perspective, knowledge is no longer truth. In this sense, knowledge construction was called sense-giving (Polanyi, 1969) or perspective-making (Boland and Tenkasi 1995) and, accordingly, knowledge interpretation was called sense-reading or perspective-taking. This makes knowledge sharing far more difficult and complex (Hislop et al., 2018: 37). Culture directly influences knowledge construction and interpretation and so conclusions about knowledge and its management cannot be extrapolated to different

cultures, countries, times or contexts (Weir & Hutchins 2005: 89; Rivera & Cox 2016; Secundo et al., 2015).

Finally, the subjective social construction of knowledge makes it open to dispute (Hislop et al., 2018:39). True knowledge is an illusion and significant amounts of time and effort are spent on legitimising knowledge and managing power conflicts. Foucault (1980) argued that knowledge and conflict (arguably both forms of practice) were inseparable. The field of knowing "*produces and reproduces a landscape of inequalities"* (Nicolini, 2011: 616) and issues related to interests, conflict and power are part of any understanding of knowledge and any attempt to manage it (Nicolini, 2007). Issues with power and conflict were insignificant in the objectivist view of knowledge and also add complexity to knowledge management, that is little explored in the objectivist approach.

The practice-based view of knowledge proposes a different approach to knowledge management. According to this view, knowledge cannot be reliably codified or held in libraries, standard operating procedures, organisational manuals, etc. (Goodell & Roberts 2003). This makes knowledge very hard to manage. Moreover, the sharing of views by knowledge constructors and knowledge interpreters is a complex social enterprise that can be facilitated but not robustly managed. One way of facilitating (rather than managing) knowledge is by practice, where *"immersion in practice is the process whereby people develop, share and communicate knowledge through either undertaking a particular task or closely observing someone else who is carrying out a particular task"* (Hislop et al., 2018: 42). The overall management – or facilitation - of knowledge should focus on indirect approaches, such as encouraging a culture of knowledge-sharing, including providing forums for social contact, allowing the development of effective communities of practices and designing jobs in a way that ensures knowledge communication (Hislop *et al.* 2018: 42).

Within the practice of medicine, there are examples to show the success of this approach. Medical training, particularly specialised training that is pursued after qualifying at medical school, is largely practice-based. Medics will be given an opportunity to practise the speciality of their choice for many years within a team. Although this includes considerable reading and academic work, there is usually little formal teaching or lectures (www.bma.org.uk). The concept of sharing practice as a form of managing what we know

probably initiated the establishment of the medical societies (and the Royal medical colleges in the UK), where the focus is on linking practitioners together to reflect on their practice (www.rcplondon.ac.uk). Nicolini (2011) used the practice-based view of knowledge to study a healthcare service. He focused on patients with heart failure who received part of their care from nurses by telephone, to assess their health status and advise them about treatment. Nicolini showed how the nurses' knowledge developed and then became embedded in the practice of telephoning. This, according to Nicolini, was not explicit or codifiable knowledge and can only become transferable through the practice of calling patients.

Practice in organisational life is poorly understood *"because a unified theory of practice does not exist*" (Nicolini, 2012:1) and there is no such thing as a unified practice approach (schatzki, 2001). Several scholarly traditions on practice were summarised by Nicolini (2012) in an attempt to create a social theory. Nicollini's work (2012) was on practice that is relevant to work and the organisation. Knowledge and its management were approached as only one aspect of social life. This is because *"phenomena such as knowledge, meaning, human activity, science, power, language, social institutions, human transformation occur within and are aspect or components of the field of practice*" (Schatzki 2001:2). What Nicolini (2003, 2007, 2009, 2001, 2012) and others (Blacker 1995, Orr 1996, Cook and Brown 1999, Gherardi 2001 & 2006, Swan and Scarbrough, 2005) claiming is that knowledge is a social phenomenon or, more precisely, a social activity. Nicolini (2012) summarises this position:

> *"The contemporary interest in practice is fuelled by the search for a new breed of social theory based on the intuition that basic phenomena such as knowledge, meaning, human activity, science, power, language, social institutions and historical transformations occur and are components of the field of practice. What should emerge from the previous chapters, however, is that practice theories hardly constitute a uniform and homogeneous theoretical corpus. The contemporary interest in practice and practices is, in fact, rooted in a number of diverse approaches and traditions" (p:214*).

As an organisation, the NHS is busy with practice and full of social interactions, which components of organisational life may have influenced the meanings given to the concept of knowledge by the medical staff. This thesis aims to understand such meanings and their

bases, and also explore ways to use such understanding to manage knowledge within the NHS.

The practice-based view of knowledge seems more mature than the objectivist view, as it acknowledges the complexity and subjectivity of knowledge as well as the role of human nature within the process. There are ample examples in healthcare services to show how practice and knowledge are linked, related or overlapping. However, although this perspective locates knowledge within practice, it does not provide a definition of knowledge. Studying knowledge and knowledge management according to this perspective demands a survey of the extensive literature on sociology, including groups and their dynamic, communities of practice, organisational culture and power and conflict. When problems arise, one cannot tell whether this was due to a communication failure, cultural clash or power struggle.

This discussion leads to the conclusion that most of social life is practice and this includes work and organizational knowledge. This is plausible and would influence how we feel about and approach knowledge; for example, by looking beyond books and libraries to manage knowledge. However, this has not led to the establishment of knowledge management as a credible academic discipline or a useful business management tool (see section 2.8). During this research project, the participants were interviewed to search for further social meanings of knowledge within practice. Hence the research question: “what does it mean to know something?” In Chapter 6, the emergent theory of this research is related to both views of knowledge, as described in the contemporary literature. The overlaps as well as contradictions are examined. The next section examines the communities of practice as a promising tool for managing knowledge.

**2.7 Communities of Practice (CoP)** is the most popular concept in the knowledge management literature (Hislop, 2018, 195, Roberts 2006). This concept was introduced by Lave and Wenger (1991) and Brown and Duguid (1991) and soon became an accepted “*mechanism through which knowledge is held, transferred and created”* (Roberts, 2006, p.623). Unlike formal teams within an organisation, CoP are voluntary, non-hierarchical, self-managing social entities that develop over longer periods of time and have an indefinite time frame, within which people negotiate objectives and governance arrangements (Hislop 2018, Wenger 1998, Roberts 2006). According to Wenger (1998),

the CoP approach focuses on the social interactive dimensions of situated learning. Wenger (1998) identified negotiation as a key concept in the dynamic of CoP (p. 55). This takes the group into three consecutive stages: 'mutual engagement' that establishes the accepted norms, feelings of a 'joint enterprise' that enhance the coherence of the group and, finally, the group produces a 'shared repertoire' of resources, including knowledge, routines and practice (Wenger 1998, p. 72). However, given the continuous staff turnover and movement, CoP are changing and dynamic in nature. Moreover, being social entities that depend on shared cultural values, CoP cannot be formally established or directly managed (Lava & Wenger 1991). However, smart management interactions with CoP can enhance knowledge utilisation within the firm (Brown and Duguid 2001) and this has been a fertile field for research and publication in the KM literature. CoP have been proven to be a useful concept for understanding learning and knowledge within firms as well as effective entities for improving organisational outcomes (Dalkir, 2017; Hislop *et al.* 2018). CoP facilitates the sharing of knowledge. Knowledge sharing is also one of most influential concepts in knowledge management and CoP provides a venue in which such sharing can be nurtured (and possibly managed). Understanding how CoP work is critical to this thesis, as it could help to answer the research question of this project regarding what it means to understand something. Moreover, knowledge about CoP helped with the selection and classification of the participants who took part in this research (see Chapter 4 on the theoretical sampling). CoP usually have masters (old timers), young masters (journeymen) and apprentices (newcomers) (Lave and Wenger 1991). Each of these groups makes a different contribution to the knowledge process, as demonstrated by the research findings (see Chapter 5).

However, CoP has a downside. This is because the *"very qualities that make a community an ideal structure for learning – a shared perspective on a domain, trust, a communal identity, long-standing relationships, an established practice – are the same qualities that can hold it hostage to its history and its achievements*" (Wenger *et al.* 2002 p.141). Like any other social entity, CoP is vulnerable to issues related to the power dynamic between its members as well as to issues of building and losing trust among the group. The "*unequal relations of power*" (Lave and Wenger 1991, p.42) was considered early in the discussion of CoP, but not fully explored until later (Fox 2000, Mork *et al.* 2010). The argument here is that new members will not have the same knowledge as old members. Given the link between knowledge and power (Foucault 1979, p.27), the process of negotiation, as described by Wenger (1998), will be unbalanced. Also, as the members of CoP share knowledge and develop their practice, they also compete with each other for status and

promotion opportunities (Hislop 2018, p.210). Roberts (2006) remains optimistic that understanding power issues can be managed by decentralising networks so that *"communities of practice have the potential to provide a place free from the power construct evident in formal organizational structure, offering a space for experimentation and creativity*" (p. 628).

The other downside of CoP is the creation of inward-looking communities (Hislop 2018). This is largely due to the predispositions (Roberts 2006) that the members may have, which will influence their negotiation of meanings within the group. The result could be better engagement with certain types of knowledge to the detriment to others. CoP can be static due to their resistance to change and this brings change management (a major domain in the management literature) into the equation, as *"while communities of practice may support the accumulation of incremental knowledge development, they may reduce the scope for radical innovation"* (Roberts, 2006, p.630).

Finally, within CoP, knowledge is thought to be generated and changed by the social practices of humans within the boundaries of a community but the CoP approach does not explain what knowledge is. This is because "*community of practice theory tells us nothing about how, in practice, members of a community change their practice or innovate*" (Fox, 2000, p.860). The CoP approach and its criticism have provided support for the theory constructed from this research. As explained in Chapter 7, the constructed theory allows a different understanding of the concept of knowledge which provides new explanations, based on building confidence, of how CoP works and why power conflicts and bias emerge. The next section discusses the practical and academic problems associated with the concept of knowledge.

### 2.8 Meanings of Knowledge and the Implications of these for KM:

The above discussion of KM, its models and practical uses have shown that one of the most problematic issues in the field of knowledge and knowledge management is agreeing on the basic meaning of the subject. What knowledge is and how it can be managed remain far from clear. The following is a further discussion on the extent of the problem of finding a definition, as expressed in the KM literature. This is followed by a description of the concerns raised in the literature regarding the lack of consensus on the practical effectiveness of KM. Finally, I will summarise my main conclusions regarding this issue and link these with the research question of this project.

Jasimuddin (2012) extracted 37 different definitions of knowledge management from the literature. He explained:

> *"Many attempts have been made to define knowledge management…Thus far, no consensus has emerged even on a core definition of knowledge management"* (p. 38) *"The understanding of the knowledge management phenomenon remains fragmented and contested"* (p. 43).

Girard and Girard (2015) identified more than 100 published definitions of KM and the subject can be firmly linked to another 12 disciplines (Dalkir, 2017, p.5). Boyett and Boyett (2001) argued that it is easy to discuss knowledge but very difficult to find a comprehensive definition of it. Newell *et al.* (2002, p. 3) argued that *"knowledge is an intrinsically ambiguous and equivocal term".* Hlupic *et al.* (2002) state that *"a possible reason for the vagueness and ambiguity in the definition of organizational knowledge seems to be that the word knowledge means different things to different people who are coming from different academic and philosophical backgrounds"* Interestingly, Earl provided a comprehensive taxonomy of the knowledge management schools of thought. However, he admitted that a distinguishing definition of knowledge itself was not provided as an attribute to any of these schools (Earl, 2001). *"Just like knowledge itself, knowledge management is difficult to define"* (Earl 2001, p 215). The lack of agreement on the meanings assigned to knowledge and knowledge management can be frustrating. Dalkir writes:

> *"It may seem strange that knowledge management is almost always defined at the beginning of any talk or presentation on the topic (imagine if other professionals such as doctors, lawyers or engineers began every talk with "here is a definition of what I do and why*")" (Dalkir, 2011, p. 15).

Dalkir goes on to suggest:

> *"It is highly recommended that each organization undertake a concept analysis exercise to clarify their understanding of what knowledge management means in their own context"* (Dalkir, 2011, page 14).

The idea of organizational knowledge is *"much talked about but little understood"* (Tsoukas and Vladimirou, 2001). The problem of knowledge meaning is complex and contains several dimensions. When all of these dimensions are combined, it becomes difficult for two researchers to agree on what the topic under discussion really is. Hislop writes:

> *"Almost every book or article published on the topic has a different definition of knowledge management, with these ranging from relatively narrow and specific definitions, to extremely broad and generic ones"* (Hislop, 2009, page 52).

This lack of agreement on what knowledge is may have led to the failure of KM to become a credible academic discipline or useful management tool. For example, although within the NHS there are training and education departments and/or committees in almost every trust, there are very few KM departments or committees. The following quote from a recent book dedicated to knowledge management summarises the issues considered so far in this chapter:

> *"…its [KM] recognition as a scientific discipline is still debated...On the future of KM there are, however, diverging opinions. In particular, some critics affirm that KM has weak theoretical grounds: ambiguous definitions, inconsistent interpretative frameworks of phenomena, and lack of a shared perspective in a field that is multidisciplinary in nature. Others add that KM is just a 'rebottled old wine' that simply takes and recombines ideas and practice methods from past managerial disciplines and approaches. And there are those that affirm that KM practice, despite the huge investments by companies, has a high percentage of failure, and there is also a problem of measurement of benefits and costs"* (Bolisani and Handzic, 2015, p. vii).

The views expressed in this quote were further exposed in the empirical research. Heisig *et al.* (2016) interviewed experts and practitioners world-wide and found that *"there is a clear view among KM experts from academia and organizational practice that the relationship between KM and business outcome requires further research"*. This is because "*the business case to show that KM improves organizational performance… is still to be demonstrated*" (p. 1173).

Further criticism of the field of KM came from Serenko and Bontis (2013), who performed a scientometric analysis of 63 relevant articles on KM. They concluded that KM is not a reference discipline, as *"a reference discipline is an academic field that has made a strong theoretical and/or methodological impact on other scientific fields*" (p. 149). This is a very significant criticism of a field of enquiry that is always seen as multidisciplinary. They also concluded that *"the direct impact on practice of the KM discipline is somewhat limited*" (p. 149). These concerns were also raised by another interview-based research project. Booker *et al.* (2008) concluded that *"there is a disconnect between KM/IC theory and practice…KM/IC academic articles are not in a form that is directly suitable for practitioners"* (p. 243).

Wilson (2002), a KM researcher, reviewed the knowledge management literature, including the content of the web. His paper identified some of the problems that are facing the field. Wilson thought that knowledge management is, in many aspects, similar to other

management fads[7] and fashions (such as downsizing, business process re-engineering, etc.) and is likely to face the same fate as these. Like many other writers, Wilson found that publications in the field came from many both related and unrelated disciplines, ranging from medicine to engineering, management and computing and information systems. These are sometime published in what Wilson describes as journals with low or no academic credibility (e.g. journals of knowledge management).[8]

From a business consultant's point of view, Wilson (2002) concluded that knowledge management means different things to different companies. From the academic point of view, he found that courses in knowledge management are limited and mostly form part of existing courses on IT, general management or other fields. Many leading universities offer no knowledge management courses at all. Wilson summaries his review of the business schools' websites as follows:

> *"The most prestigious steer well away from 'knowledge management', other than in the statements of interest of faculty. Nor does the subject appear to enter significantly into the teaching programmes. The sites often include documents in the form of reports, working papers, or draft papers and these reveal the same difficulties with the concept as shown in the review of journals"* (Wilson, 2002, p.10).

Following the discussion of tacit knowledge and people's perspective of this, Wilson concluded that one of the major reasons why knowledge management struggles is its utopian character, as it assumes (wrongly) that the human mind (where knowledge resides) can be managed, downloaded or distributed. Moreover, according to Wilson, the principle of knowledge sharing, one of the most frequently discussed concepts related to managing knowledge by exchanging tacit knowledge, is illogical. Wilson writes:

> *"If getting promotion, or holding your job, or finding a new one is based on the knowledge you possess – what incentive is there to reveal that knowledge or share it?"* (Wilson, 2002).[9]

Wilson's overall conclusion is that: *"knowledge management is an umbrella term for a variety of organizational activities, none of which are concerned with the management of*

[7] Following on from Wilson's (2002) concerns, Grant (2011) completed a discourse analysis of the KM literature. Grant (2011) showed that Wilson's (2002) prediction that KM is a management fad was untrue, as the number of KM publications, although seeming to be in a stable state, has not declined. However, Grant's (2011) review was problematic because it included topics such as ICT, which has become very active because of the technical advances. Grant (2011) does not appear to focus on KM alone.

[8] Some knowledge management publications did appear in high quality journals but this did not help to achieve a consensus on what knowledge is or transform the subject into an effective management tool.

[9] This is an electronic journal publication in the form of a single document without page numbers.

*knowledge"* (Wilson, 2002).[10] Likewise, Scarbrough *et al.* (1999) and Scarbrough (2003) state that KM is a management fad. Scarbrough *et al.* (2005) argue that KM is not only a management fad but also a sub-discipline of Management Information Systems.

I can identify four reasons for the confusion about the meanings of knowledge and the associated weakness of KM within business administration. Firstly, when someone talks about KM, presents research findings or suggests practice changes, it would be difficult to say 'but this is not KM' or to find inconsistency in their argument. It seems that, within KM, anything goes, i.e., KM is not falsifiable and hence it may be a pseudoscience (Popper, 2004). Grant (2011) reviewed the KM literature and explained that *"one concern that this review has identified is whether the variety of topics often considered to be knowledge management really from part of the same field…perhaps the greatest concerns from this review are the increasing divide between practitioner and researcher in this field and the confusing perceptions of what is or is not knowledge management*" (p. 130).

Secondly, the knowledge definition problem is related to the existence of two dominant but contradictory perspectives on the subject. As discussed in section 2.6, these are the objectivist and the practice-based views on knowledge (Cook *et al.,* 1999). Whilst the NHS requires both views to manage its knowledge (section 2.3), operating both perspectives in the same human mind is difficult (section 2.6)

A third reason for the problem of knowledge definition originates from the similarities and differences between the building blocks of the subject; namely, data, information and knowledge (sometimes with the addition of wisdom) (Roberts, 2015). The distinction between data, information and knowledge is sometimes blurred, which adds to the confusion. Earl (2001), in his seminal paper on knowledge management strategies, admitted that many chief knowledge officers and chief executives, who were interviewed for that research, were not overtly concerned about the distinction between data, information and knowledge (Earl, 2001). This probably reflects these practitioners' frustration at the theoretical confusion related to the subject. However, it is helpful to consider data as basic facts that are used as a basis for inference and usually obtained using our senses (Jashapara, 2004). These usually take the form of lists of numbers (e.g. the population size of different cities in a particular country) or a factual description of a case or situation. Data are not manipulated by the human mind and are expected to be

[10] ditto

neutral and impartial. However, the reality is that our senses are notoriously unreliable and can be deceptive.[11] Also, humans are highly selective regarding what they sense (or count). On the other hand, information is systematically organised data (Meadows, 2001). Information is meaningful and serves a purpose. It can be produced by examining, testing and comparing data. Knowledge is considered a superior entity. However, a consensus on a definition is lacking (Tsoukas *et al.*, 2004). Knowledge is created by a flow of information, anchored in the belief and commitment of its holder and eventually translates into human action (Nonaka, 1995). How knowledge is related to information and influences the knower's action is unclear. A better understanding of knowledge and how it relates to data and information enhances knowledge management.

Interestingly, in some healthcare discourses, especially those that are heavily influenced by computer systems, information is considered a better concept to deal with and is allocated a more general position than knowledge, as seen in the following definition:

> *"Information [is] the data and knowledge that intelligent systems (human and artificial) use to support their decisions*" (Sullivan *et al.*, 2006).

Healthcare activities produce large amounts of data. These data are usually transformed into information and published in the form of statistics, reports and research papers. The process of transforming information into knowledge seems to be critical, and the understanding of such a process will depend on what is meant by knowledge, which will be explored in this research project.

A final reason for the problem arises from the multidisciplinary nature of knowledge management and so a variety of definitions have come from a number of different perspectives (Jashapara, 2004). Lopez (2004) explained that differences in the understanding of KM are due to the fact that KM has been studied by several different disciplines and from different approaches. A *strategic perspective* offered a definition of knowledge management based on the achievement of the organisational goals by making knowledge productive (uit Beijerse, 2000) and by the mobilisation of the knowledge base in order to ensure continuous innovation (Newell *et al.*, 2002). *A human resource perspective* defines knowledge management as any process or practice of creating, acquiring, capturing, sharing and using knowledge, wherever it resides, to enhance learning and performance within organisations (Swan *et al.*, 1999). From *the information*

[11] For example, Escher's drawings can be seen in different ways and show how our senses can become confused: www.mcescher.com.

*system perspective*, knowledge management draws on the existing resources that an organisation may already have in place, such as good information systems management (Davenport *et al.*, 1998). Therefore, the knowledge management style, within an organisation, can be influenced by the domination of one perspective over the others. This could explain the variations in the definitions of organisational knowledge and its management. It would be interesting to know how the NHS defines its knowledge and what style it would choose to manage it.

**Research focus:**

This project aims to explore the meanings given by medical staff to the concept of knowledge, with the aim of defining knowledge and then extending this to the management of knowledge within the NHS. Blackler (1995) proposed an approach to link knowledge, knowing and doing. This is summarised as follows:

**Step 1**: Knowledge (input): This includes: writings (books, journals, protocols and policies), audio-visual (lectures, tutorials), social interactions, etc.

**Step 2**: Knowing: People's interpretation and understanding of the input. This project focuses on this stage.

**Step 3**: Doing (output): Changes in the organizational performance as an output.

Step 2 is embodied by people and so is least accessible to observation or direct measurement. This step constitutes an important link between what can be done (input) and the desirable change in business performance. It is common for knowledge management initiatives to manipulate the input (provide a new IT system or modify educational materials) and then try to measure any changes in performance. By doing this, these initiatives completely ignore people's understanding of the whole process. A lack of understanding of people's interaction with their surroundings may explain why throwing more funds into knowledge sources, such as IT systems, does not necessarily translate into improved performance. Keen (2006) argued for this and provided a disturbing conclusion in her chapter in *Healthcare Management*:

> *"IT and electronic services are attractive to politicians and policymakers. There is scant evidence that investment in IT and electronic services are cost effective"* (Keen, 2006, p. 234).

One may define knowledge as the three steps working together. Alternatively, one could be precise and define knowledge as people's interaction with knowledge sources (step 2 only). Jashapara provided a definition that links step 1 with step 3:

> *"In a practical sense, knowledge could be considered as 'actionable information'"* (Jashapara, 2004, p 16).

This definition, although it does not describe how, hints at the possibility that knowledge sits between provided information and visible actions, i.e. knowledge is somewhere in step 2. Knowledge is probably still the missing link to competitive business performance (Blackler, 1995). Wilson (2002) summarises Blackler's (1995) stages in the following quote:

> *"Knowledge is defined as what we know: knowledge involves the mental processes of comprehension, understanding and learning, that go on in the mind and only in the mind, however much they involve interaction with the world outside the mind, and interaction with others. Whenever we wish to express what we know, we can only do so by uttering messages of one kind or another – oral, written, graphic, gestural or even through body language. Such messages do not carry knowledge, they constitute information which a knowing mind may assimilate, understand, comprehend and incorporate into own knowledge structures. These structures are not identical for the person uttering the message and the receiver, because each person's knowledge structures are, as Schutz (1967) puts it: biographically determined"* (p. 2).

Given the discussion in this chapter, searching for a meaning for knowledge within the NHS is a reasonable step towards the effective management of a valuable asset of any health service. This project looked at the meanings of knowledge as understood by people. This project researched what happens between providing information to people and the observed changes in their practice. It asks what it means to know something and how this can change one's practice.

### 2.9 Conclusions:

Knowledge management faces serious academic criticism, mainly due to vagueness and inconsistency. It has not been shown to influence practice, other fields of science, or organisational outcomes, or to be cost effective. Its position could benefit from agreeing on definitions for its basic terms, including knowledge itself, and this research project aims to clarify what is meant by knowledge within the context of NHS medical work. Following from the literature presented, this research explored how the staff make sense of, and interact with, sources of knowledge, how they thought these may influence their practice and ultimately, what it means to know something. The research constructed a theory,

grounded in views obtained from interviewing NHS staff, to define the processes involved in the above point. This uncovered new links between knowledge and confidence, a form of emotion. This should help in designing a better knowledge management system for healthcare services.

There is strong agreement amongst academics, theorists and business leaders such as CEOs that knowledge is critical to the contemporary firm as it provides a competitive advantage to organisations. The work of Bell (1973) correctly predicted the growth of knowledge-based enterprises, and the results of the implementation of several knowledge-management projects were published. Healthcare services are no exception. However, there is no consistency in the literature regarding an agreed understanding of the meaning of knowledge.

Reviews of key publications in the field of knowledge management (Hislop, 2013; Dalkir, 2011) showed a marked diversity in management approaches which may have caused distraction and inconsistency. The NHS is knowledge intensive and several initiatives have been implemented to manage the knowledge and information within this organisation. These mainly targeted explicit knowledge through IT projects and codification. The current models of knowledge management do not necessarily meet all of the NHS's needs. Research from within this organisation may shed more light on the elusive concept of knowledge and its management.

A lack of common understanding of the term knowledge may have caused confusion in the academic field as well as in the practice of knowledge management. For a knowledge-intensive organisation such as the NHS, knowledge is everything and everything is knowledge. It is worth reducing the size of this concept, so that it covers less and reveals more (Alvesson *et al.*, 2001). This research constitutes an attempt to explore how NHS professionals define or make sense of knowledge. This, if successful, will be a first step towards a tailored knowledge management model for the NHS. This research seeks to understand how medical staff in the NHS make sense of and interact with the sources of knowledge and how such interactions influence their practice - and so what it means to understand something.

## Chapter 3

## Research Philosophy: the interpretative constructivist approach

### 3. 1 Introduction:

In conducting research, a researcher must make several choices with regard to the research design (Blaikie, 2007: 5). Not all are voluntary or even conscious choices and are made "*usually by default*" (Johnson and Duberley, 2003: 1280). A social enquiry needs to be carefully positioned within the qualitative-quantitative spectrum of research approaches. A research philosophy needs to be adopted; this could be positivist, interpretative, critical, postmodern or any of the other philosophical underpinnings of research, many of which were described by Burrell and Morgan (1979). A suitable research methodology must be employed. This could be experimental, observational or based on a survey, ethnography, phenomenology, grounded theory or one of the many other methods (Cassell and Symon, 2004). These choices are not automatic, and incompatible choices can prove problematic (Urquhart, 2013: 57). On many occasions, researchers must justify (if a positivist), explain (if an interpretivist) or argue (if a critical theorist) their choice of a certain methodological approach. This is because one point of view states that "*qualitative studies are usually exploratory by their very nature and do not provide generalizable answers*" (Lorder et al., BMJ, 2016: i641), whilst other points of view criticise quantitative research because "*methods derived from the natural sciences have come to be seen as increasingly unsatisfactory as a basis for social research*" (Morgan and Smircich, 1980, p. 491).

This chapter explains the rationale for using constructionist grounded theory underpinned by an interpretative philosophical approach in this dissertation. This work is based on an ontology that assumes multiple realities which can be approached epistemologically by the subjective co-construction of meanings between the researcher and the participants (Charmaz, 2014: 236). These choices were, to a great extent, influenced by the research question (Myers, 2009: 14), and practically guided by the work of Charmaz (2014) and Urquhart (2013).

The literature review (see Chapter 2) identified a number of relevant issues concerning the professional knowledge of medical staff within the NHS which will be explored in this project. These include:

- understanding how staff make sense of, and interact with, their surroundings when searching for knowledge, and what factors may influence them.
- exploring what knowledge may mean to this group of staff and constructing a theory, grounded in views obtained from interviewing NHS staff, to define knowledge and the processes involved in its development.
- understanding the issues related to the above as a basis for designing a better knowledge management system for healthcare services.

These research questions and their answers are heavily based on people's views, feelings and interactions. This makes this research a social enquiry and so a qualitative approach ensured that a far deeper insight was obtained regarding the nature of knowledge and its development in this particular social context (Flick, 2009, p. 25, Blaikie, 2007, p. 124-131).

In this chapter, the theoretical grounding of this project will be discussed. This includes: the qualitative and interpretative approach adopted; symbolic interactionism as an appealing philosophy; grounded theory as a pragmatic research method; and constructivist grounded theory as an appropriate methodology.

### 3. 2 The qualitative and interpretative approach of this research:

This is a qualitative project which was completed using constructionist grounded theory underpinned by an interpretative philosophical approach. Many definitions have been produced to explain qualitative research; for example, a basic view is:

> "*Qualitative research is a research strategy that usually emphasizes words rather than quantification in the collection and analysis of data*" (Bryman 2008, p. 366).

A more detailed definition that covers more of qualitative research's features states:

> "*Qualitative research is an umbrella term for an array of attitudes towards and strategies for conducting inquiry that are aimed at discovering how human beings understand, experience, interpret, and produce the social world*" (Sandelowski, 2004, p. 893).

A 'qualitative' rather than a 'quantitative' approach was selected for this project. This was directed by the research questions and relates to the features of qualitative research as explained by Hammersley (2013). These are: a flexible, inductive and abductive orientation

of analysis; a relatively less structured kind of data that make it possible to capture the participants' views; subjectivity is acknowledged; the study of natural settings rather than experimentation; a small number of cases studied in depth; and finally verbal rather than statistical analysis of the data. The research design for this project was consistent with all of these features and hence a qualitative approach was pursued. Studying a phenomenon as difficult as a knowledge process within a dynamic social enterprise such as healthcare requires all possible flexibility to allow reasonable induction to be drawn from the subjective views of the participants. Such participants should be given enough time to explain themselves (in-depth interviews) and their responses should not be unduly influenced by a restrictive interview design or fixed yes/no answers (semi-structured interviews).

Quantitative research seems able to tackle only accessible, objective, measurable, unchanging data (or predictably changing data, such as the speed of sound in different media). During a social enquiry, such an approach could over-emphasise measurable events, even if trivial, while ignoring the 'real' issues (Oktay, 2012: vii). It does not seem able to cope with the differences and nuances in the views that people hold regarding a piece of objective data; i.e., the principle of subjectivity. The usefulness of this approach in social research has been questioned (Morgan and Smircich, 1980, p. 491). On the other hand, a qualitative approach dares to tackle the immeasurable, unseen and inaccessible; e.g. how terminal patients and their carers feel about (and hence manage) the concept of death (Glaser and Strauss, 1965). This approach takes the risk of accepting variations, and does not aim for hard truth or generalisability but only at developing understanding. This approach, although it does not provide a comprehensive law of nature, brings us as close as possible to understanding social life (Flick, 2009, p. 25).

Knowledge is an elusive concept which has caused more philosophical debate than any other idea in human history. Choosing a qualitative approach to investigate medical knowledge requires some deliberation. Knowledge is sometimes seen as a personal matter, very close to people and hidden in their soul and thinking (Wilson, 2002), and so requires the gentle, sensitive subjective approach of a qualitative researcher. Although a qualitative approach seems worthy of consideration, several medical journals (unlike the nursing literature) are unsupportive of this approach to inquiry. The British Medical Journal (BMJ),[12] the leading medical journal in the UK, rejected a plea from more than 77 senior

[12] The BMJ is the most influential and widely read medical journal in the UK; its impact factor was 23.6 in 2017.

academics from ten countries to reconsider their policy of rejecting qualitative research on the grounds of low priority (Greenhalgh et al., 2016). The BMJ argued:

> "*In general, our aim is to publish studies with more definitive - not exploratory - research questions that are relevant to an international audience and that are most likely to change clinical practice and help doctors make better decisions… we do not prioritize qualitative research because, as mentioned in our information for authors, qualitative studies are usually exploratory by their very nature and do not provide generalisable answers…Although most qualitative studies will not be in line with the BMJ's objectives, we agree they can be valuable*" (Loder et al., BMJ, 2016: i641).

However, only a few months later, the BMJ took a contradictory stand by publishing an analysis explaining the importance of social context and people's mindset (Crum et al., 2017). The editor of the BMJ wrote in support of this analysis and in relation to clinical trials of vitamin D supplementation:

> *"Trials may be the answer to this particular question, but Crum and Colleagues caution that medical diagnosis and treatments are never isolated from patients' mindsets and social context and that despite the many benefits of randomized trials, they may obscure the psychological and social elements underlying placebo effects in active treatment. The psychological and social forces of healing have potential benefit, even though they receive much less attention than drugs and devices"* (Editor's choice, the BMJ, 2017: 252).

The BMJ's position regarding qualitative research probably reflects their strong positivist experience and may also reflect their struggle in crossing the boundaries between different research paradigms. This supports the argument that different philosophical stands on research methodology may be incommensurable, as Burrell and Morgan (1979) wrote about their proposed philosophical paradigms:

> *"The four paradigms are mutually exclusive… A synthesis is not possible… one cannot operate in more than one paradigm at any given point in time, since in accepting the assumptions of one, we defy the assumptions of all the others"* (p. 25).

On the one hand, the BMJ appears sceptical about the rigour of qualitative approaches but, on the other, is well aware of the shortfalls of quantitative research. The BMJ's confused position on research methodologies - used to obtain 'knowledge' - may also reflect a struggle to define knowledge within the medical community and also how to secure and manage it. Is knowledge objective, measurable and generalisable results obtained from clinical trials? Or is it a softer, context-bound understanding of people's psychology and culture? And how do these two types of knowledge interact? The philosophical underpinnings of this research - as explained later in this section - favour the

latter. The BMJ seems to be aware of two types of knowledge and, although it regularly publishes quantitative knowledge, is acutely aware of qualitative knowledge. Pursing a qualitative methodology in this project should bridge some of the gaps in the current medical thinking.

The importance of qualitative research and its development since the 1970s are well expressed in this quote by Oktay:

> *"I received a PhD in Sociology and Social Work at the University of Michigan in 1974. At that time 'research' meant 'survey research. ' Qualitative research was not even on the radar…I conducted several quantitative studies...At the end of these studies, I often felt that while I had answered my carefully constructed research questions, I had learned little about the truly important questions. Frustrated, I ended up with more questions than I had at the start"* (Oktay, 2012, p. vii).

Oktay's experience supports Morgan and Smircich's (1980) argument that quantitative sciences are less satisfactory for a social enquiry. Myers (2009) provides some guidance on the selection of a research methodology:

> *"If you are trying to decide whether to do qualitative or quantitative research in a business discipline, the choice should not be made on the basis of whether one approach is more rigorous than the other. This would have been a valid question in the 1980s and early 1990s, but it is no longer a valid question today. Rather, the choice should be more on the topic, on the research question you want to ask, on the basis of your own interest and experience, and how relevant you want to be to practice"* (p. 14).

Myers' advice was followed by linking the research question (what knowledge means to people) to the research methodology (the interpretative constructivist approach). The literature on knowledge management adopts two main perspectives. The objectivist perspective sees knowledge "*as an entity/commodity that people possess, but which can exist independently of people*" (Hislop, 2013, p. 17). However, this was considered by some as epistemologically flawed (Hislop et al, 2018: 30) and so the practice-based perspective has emerged. It is more complex and involves all people's actions and activities, not being restricted to their cognition (Hislop, 2013). Together, these two perspectives create a very wide scope and this makes 'knowledge' an elusive concept that means everything and fits every situation. In this project, a search for the meanings of knowledge took place as close to the knowledge workers as possible. Given the assumption that the phenomenon under investigation (making sense of the concept of knowing something) is embedded in people and related to their mental and social interaction with their surroundings (Wilson 2002), a qualitative research approach was

selected for this project. The process under investigation is not accessible to direct objective measurement. However, the phenomenon could be approached, and probably understood but not necessarily measured, by interpreting the research participants' accounts of it. The understanding and meanings generated by the participants exist within the social world and cannot be investigated outside of social interaction (Garwood, 2006). An interpretative approach was chosen.

The interpretivist's ontological views assume "*a presumption of social constructivism that reality is a social construct and cannot be understood independent of the actors who make that reality*" (Urquhart, 2013, p. 59). Its epistemology acknowledges the social context of the study of any phenomenon and "*researchers aim to construct interpretations of practices and meanings*" (Urquhart, 2013, p. 59). Therefore, this project accepts that the processes under investigation – knowledge acquisition by staff and what such knowledge means to them – are socially constructed realities and their understanding requires the construction of several mainly context-bound interpretations.

The other argument for employing a qualitative research approach is related to the use of theory. The research questions for this project, unlike natural science research, do not provide a hypothesis for testing that will allow the adoption of a deductive strategy. The literature review on the subject (see Chapter 2) revealed a lack of an agreement on the topic (what knowledge is), so any prior hypothesis could be artificial, limit the scope of the research and prevent the emergence, discovery or construction of new explanations of the process of interaction between the staff and the sources of knowledge. This requires an inductive strategy that "*starts with the collection of data, followed by data analysis*" (Blaikie, 2007, p. 9). However, grounded theory, as used in this study, takes the analysis a step further by testing deductively the findings obtained by an inductive data analysis to verify their meanings in repeated cycles of induction-deduction (Oktay, 2012: 18). This is called an abductive approach to data collection and analysis (Oktay, 2012).

Qualitative research is an 'umbrella' term used to describe many approaches to social enquiry (Flick, 2007, p. 57; Sandelowski, 2004, p. 893). Flick (2007, p. 57) suggested three main basic positions that underpin various qualitative approaches. These are: the focus on subjective meanings by **symbolic interactionism**, the examination of the routines of everyday life by **ethnomethodology,** and the exploration of psychological or social unconsciousness by **psychanalysis**. It was thought that symbolic interactionism's emphasis on *"the subjective meaning that individuals attribute to their activities and their*

*environment"* (Flick, 2007, p. 57) should help us to understand the subjective meanings of 'knowledge' that the healthcare staff would hold. Moreover, the empirical nature of symbolic interactionism and its role in establishing grounded theory as a research methodology are likely to help in reaching a practical, analytic and sufficiently deep understanding of the research topic. Symbolic interactionism will be discussed next.

**3. 3 Symbolic interactionism (SI) as an appealing philosophy:**

Symbolic interactionism has been used to inform the philosophical stand of this research because of three features of this philosophy. Firstly, SI acknowledges the independence of the research participants as agents who can make decisions and choices. This ensured that the research participants' views were the main sources of the emergent theory. SI can be summarised into three major but interrelated premises (Blumer, 1969, p. 2). Firstly, **social interaction** is key. In responding to their surroundings, humans are influenced by others, and the interactions one has with one's fellows allow an interpretative processing and exchange of various symbols, including language. Secondly, human beings use their own **interpretations** resulting from their social interactions to create, modify and handle the meanings assigned to the things around them; i.e., humans interpret their surroundings through a process of complex thinking rather than by producing automatic reactions. Finally, human beings **act** towards things on the basis of what these things mean to them; i.e., human behaviour is not reactive, intuitional, meaningless or pre-programmed. Therefore, for humans, interactions, interpretations and actions are closely related, interdependent and reciprocal processes, and they take place within and are heavily influenced by the social context. SI rejects the views of sociology and behavioural psychology on human nature, which were commonly accepted during the last century. In this sense, sociology and psychology saw humans as reactive beings; their behaviour is a response to internal drives and external rewards or punishment (Oktay, 2012) and so human actions are largely repetitive and predictable. However, SI disagrees with this view. Given its acceptance of humans as active participants in "*constructing self, situation, and society*" (Charmaz, 2014, p. 262), symbolic interactionism, as an underpinning philosophy, has ensured that the voices of the participants are heard and used to shape the research outcomes.

The second feature of SI that makes it appealing to this research is that SI acknowledges the dynamic, complex nature of social life, so having this background ensured that the categories of the emergent theory were developed to an advanced stage to reflect the engagement of healthcare workers with their knowledge. SI is a dynamic theoretical

perspective (Charmaz, 2014, p. 262) that accepts that there exist many tools of social interaction (spoken or body language, lack of language, other behaviour, clothes, etc.). These are symbols that form the basis of the interaction between people. The presence of endless numbers of possible symbols makes social interaction complex. In addition, social interaction is a continuous process (insofar as one is living with others), and so the meanings developed by people (in response to these symbols) are responsive and changing; i.e., symbolic interactionism is a dynamic process. Symbolic interactionism explains society as a complex changing system composed of freely thinking and acting agents who are continuously responding to their social environment as well as changing their social environment due to their influence on others. This background has ensured the construction of a sufficiently sophisticated theory to explain the nature of knowledge in healthcare practice. Oktay (2012) summarises the nature of symbolic interactionism as follows:

> *"In symbolic interactionism, the nature of reality is dynamic, not static. The 'self' constantly changes as the individual interprets meanings through social interactions, takes actions, and evaluates the consequences. Also, symbolic interaction theory emphasizes social process"* (p. 11).

The final feature that supported the use of SI in this research is its link with pragmatism. The ideas that led to SI were developed within social work during the Progressive Era. Social work is naturally pragmatic, as an idea is accepted if it works regardless of any academic relevance (Cook, 1993; Deegan, 2005; Oktay 2012). Some degree of pragmatism is a requirement for any healthcare research and hence the relevance of this approach to the DBA project.

### 3. 4 Grounded approach as a qualitative research methodology:

This research is an interpretative project which uses the Grounded theory (GT) principles and coding systems. The philosophical framework was based on Charmaz's constructivist approach (Charmaz, 2006, 2014). Some of the practical details, particularly the coding, are based on Urquhart's writings (2013). Urquhart's work is interpretivist in nature and explains a clear Glaserian coding approach with detailed examples (p. 3).

Grounded theory is an approach to inquiry, the aim of which is to construct, discover or facilitate the emergence of a theory to explain a socio-psychological process (Strauss and Corbin 1998). The design of this research was based on the assumption that a theory that explains the nature of knowledge would be more helpful (pragmatic) regarding knowledge

management within healthcare services than a thick description of the related social processes. Grounded theory has found its place as a well-recognized qualitative research approach:

> *"Grounded theory method is currently the most widely used and popular quantities research method across a wide range of disciplines and subject areas. Innumerable doctoral students have successfully completed their degree using grounded theory method"* (Bryant and Charmaz, 2007, p. 1).

An appealing feature of GT is that it makes sense (Stern, 2007). GT is consistent with human intuition where people usually accumulate observations (data collection) that lead to some degree of generalisation (a theory). This is in contrast to the scientific hypothesis-testing approach.

**Suitability of GT to this particular research project:** GT focuses on investigating social processes and aims for pragmatic outcomes. Four factors were particularly important in supporting the use of GT in this research.

- GT has been extensively used in healthcare research. Glaser and Strauss's seminal study, '*Awareness of Dying'*, which led to the discovery of GT, was a healthcare-related study (Glaser & Strauss, 1965). Janice Morse published highly respected research papers in nursing using GT (Morse, 1997; Morse, 1999; Morse, 2001; Morse et al., 1991; Morse et al., 2002). She became a pioneer in this type of qualitative research and her work was used to study the continuing evolution of GT (Kearney, 2007). GT is considered a suitable qualitative research approach for clinical inquiries into healthcare systems (Chiovitti, 2003) and the experience gained by using GT in healthcare over the years had facilitated this project.
- GT is well described and rich in detail. The classical textbooks on the subject (Glaser & Strauss, 1967; Strauss & Corbin, 1998) provide step-by-step guidance on research execution. *"[Grounded Theory] provides a set of steps and procedures any researcher can follow in the construction of a theory fitted to a particular problem"* (Denzin, 2007, p. 455). This rich detail is advantageous and could benefit the research outcome because the *"use of a recognized approach to research enhances the rigor and sophistication of the research design"* (Creswell, 2007, p. 45). The GT method has been shown to be flexible and *"many qualitative researchers in business and management use grounded theory solely as a way of coding their data. As a coding technique, grounded theory is certainly very useful"* (Myers, 2009, p. 107). Urquhart's book (2013) provides practical examples and

step-by-step guidance, which was used in this project not only for the coding but also the theory construction

- The pragmatic underpinnings of GT had made it particularly suitable for this research project. "*Research as pragmatic problem solving*" (Strubing, 2007, p. 580) is not only one of the GT philosophical principles but also an important requirement for a doctorate in business administration research, where some implications for business practices (rather than purely theoretical and abstract considerations of the subject) need to be demonstrated. It has been argued that *"there is a strong bond between the thoughts of early North American pragmatism and both the methodological and socio-theoretical concepts at the core of grounded theory"* (Strubing, 2007, p. 580). This is because the expected outcome of GT is a theory, where the *"theory is always oriented towards practical problems"* (Strubing, 2007, p. 595). In pragmatism, the processes of reasoning can be accepted *"only if they prove capable of providing a solution for the situation"* (Strubing, 2007, p. 596). Moreover, the construction of a theory (see Chapter 5) can be practical and consistent with the needs of business research. *"As to the constructivist alternative…all important notions of this approach already find themselves well established in the pragmatist position"* (Strubing, 2007, p. 598). The constructivist GT is thought to be able to reveal some practical solutions to the research questions under consideration, which would satisfy the needs and aims of a doctoral research project in business administration.
- Finally, GT is concerned with social processes (Hood, 2007). The researcher generates an explanation (in the form of theory) of social processes, actions or interactions. This explanation is the product of the views of the research participants (Strauss and Corbin, 1998). GT focuses on process rather than on culture (ethnography) or lived experience (phenomenology). This is particularly helpful in a knowledge management research project, since the focus in this project is on the process of knowledge acquisition through the interaction of people with their surroundings, to achieve desirable organisational changes.

  *"Bringing process into the analysis is an essential part of our approach to theory building"* (Strauss and Corbin, 1998, p. 163).

### 3. 5 Constructivist grounded theory as an appropriate methodology:

At present, it is plausible to think of GT as a research methodology that can be used in conjunction with many (or any) research philosophies. Urquhart (2013) supports such a position:

> *"It is important to note at this point, too, that GTM itself does not have an identifiable inherent philosophy, though people have debated this very point … and come up with different conclusions*" (p. 59).

Oktay (2012) also adopted the position that GT is a methodology that can be used with different philosophies, as required by the research questions. Oktay "*support*[s] *an 'agnostic' position that blends the most useful features of the different models depending on the needs of each study*" (p. 23). Using the Glaser and Strauss (1967) version of grounded theory in this project may give the impression of a well-founded research methodology, but would obviously ignore 50 years of development in qualitative research; hence a constructivist approach was selected for this research. Given its progressive development and advancement, the qualitative approach has increasingly been accepted as a credible research paradigm and *"The ontological and epistemological grounds of the grounded theory method have shifted in forty years, most recently with the constructivist challenge"* (Charmaz, 2009, p. 129).

Charmaz summarised the constructivist GT as follows:

> "*Constructivist grounded theory is a contemporary revision of Glaser and Strauss's (1967; Glaser, 1978) classic grounded theory. It assumes a relativist epistemology, sees knowledge as socially produced, acknowledges multiple standpoints of both the research participants and the grounded theorist, and takes a reflexive stance toward our actions, situations, and participants in the field setting – and our analytic constructions of them" (Charmaz, 2009, p. 129). Constructivists realise that conducting and writing research are not neutral acts. Constructivists view data as constructed rather than discovered* (ibid., pp. 130 & 131).

The objectivist and positivist inclinations of Glaser and Strauss's early grounded theory stand in contrast to the constructivist approach. Glaser waits for strategy to emerge; Strauss discovers theory; while Charmaz constructs it.

The constructivist approach has provided a methodological underpinning for this research project. The philosophical underpinnings of the constructivist grounded theory assume multiple realities; data are mutually constructed through interaction and the researcher constructs categories. Constructivist GT views the representation of data as problematic,

relativistic and partial, acknowledging that the observer's values and position affect his/her views so any generalisations can only be partial and situated in time and space. Constructivist GT aims to create theory that has credibility, originality, resonance and usefulness, but also recognises that the co-construction of data shapes analysis and engages in reflexivity (Charmaz, 2009: 141). The constructivist GT helped this project in two ways. It liberated me to use my imagination to think widely about what was going on, particularly when writing memos. As a co-constructor of the research findings, I was not concerned that my views would contaminate the research outcomes. Secondly, the constructivist approach helped me to accept the research limitations. Being constructs of humans (both the research participants and the researcher), the finding of this research are not absolute scientific truths and so I aimed to link them with constructs from other research, rather than reject other views and work as competitors and contradictions.

### 3. 6 Reflexivity:

The design and outcomes of qualitative research are coloured by contributions from the researchers themselves, who are seen as co-constructors of the research findings (Finlay and Gough, 2003). The involvement of the researcher in a qualitative inquiry must be brought to the surface through the process of reflexivity; hence the importance of this section. Reflexivity is difficult to define, let alone practise or define the quality of such practice. Cunliffe (2003) writes:

> *"It is difficult to capture a single definition or focus of reflexivity. Questions arise over whether it is a philosophy, a research method or a technique, and numerous types of reflexivities have been identified"* (p. 984).

However, for the sake of this project, the reflexive discussion will be guided by a couple of descriptions of the concept: Weick (1999) suggested the practice of *"thinking about our own thinking"* to help to understand researchers' contribution to research (also discussed in Johnson and Duberley, 2003, p. 1279). Finlay and Gough (2003) provided more detailed practical guidance:

> *"Reflexivity requires critical self-reflection of the ways in which researchers' social background, assumptions, positioning and behaviour impact on the research process. It demands acknowledgement of how researchers (co-)construct their research findings. Reflexivity both challenges treasured research traditions and is challenging to apply in practice"* (p. ix).

The contributions of my pre-existing bias and assumptions about the field of knowledge and medicine required strong reflexive awareness. This undoubtedly influenced my choice of topic of enquiry as well as the language used to communicate the research questions

**3. 7 Conclusion**:

This chapter provided a justification for the philosophical stand I employed in this research. This was a qualitative enquiry that I completed using constructionist grounded theory underpinned by an interpretative philosophical approach. This philosophical stand helped me to link the research questions to the participants' responses to form a coherent conclusion. The philosophical choices were, to a great extent, influenced by the research questions. In this research, I aimed to understand how NHS staff make sense of, and interact with, their surroundings in searching for knowledge and explore what knowledge may mean to them. A qualitative approach was selected. The features of qualitative research, as explained in the literature, allowed gentle but sufficiently in-depth interactions with the participants and ensured that they were able to act as free agents. Symbolic interactionism as an underpinning philosophy ensured that the voices of the participants were heard and used to shape the research outcomes.

I considered GT particularly suitable for this project because of its philosophical underpinning. Some degree of pragmatism is a requirement for any healthcare research and hence the relevance of this approach to the DBA project. GT is a well-described research methodology and has been extensively used in healthcare research. I selected the constructivist version of GT because it acknowledges the contribution of both the researcher and the research participants to the research outcomes.

## Chapter 4

## Methodology:
## Grounded Theory for Qualitative Research[13]

### 4.1 Summary of the method:

Medical practitioners (consultant grade doctors)[14] from an NHS Trust were selected as suitable informative research participants for this project. Semi-structured conceptual qualitative interviews lasting about 90 minutes were completed, recorded and fully transcribed. The process of coding started with the first interview, as per the GT tradition. The coding included open coding, where every line of an interview was labelled with a code. Selective codes were then developed by grouping and relating open codes into a smaller number of selective codes that were analytic in nature and also related to the research focus. The principle of theoretical sampling was used to direct the selection of further interviewees to ensure saturation of the categories that were relevant to the research questions. This cycle was repeated several times to reflect the iterative nature of GT. A total of 12 interviews were completed and this led to the construction of six main categories that were thought to define the process of knowledge acquisition by medical practitioners in the NHS. These are: motivators to knowledge, sources of knowledge, the process of knowledge acquisition, peer influence, practice and, finally, knowledge as confidence. The latter was selected as the core category for the theory building. Theoretical coding was used to unite the six main categories into a coherent theory. Memos (my thought, feelings and analysis of what was happening) about all stages of the research were captured, documented and further developed in a structured way. Memos directly assisted the construction of categories and ultimately the development of the emergent theory. The following diagram summarises the research method and the rest of this chapter explains the stages of the method in detail. These include: interviews as the data collection tool, the interview questions, the use of theoretical sampling, the different stages of the coding, and memo-writing. Finally, the chapter will end with a note on the ethical approval of the research and a conclusion.

[13] 'Grounded Theory for Qualitative Research' is a book by Professor Cathy Urquhart (2013), that was used extensively to guide the methodology of this research.

[14] The other group is doctors-in-training, but this group was not included in this research, as being in training meant that they are not in charge of their knowledge management. They are influenced by the training programmes and so knowledge may mean different things to them. This research focuses on fully-trained, specialist doctors. See section 4.4 on the theoretical sampling.

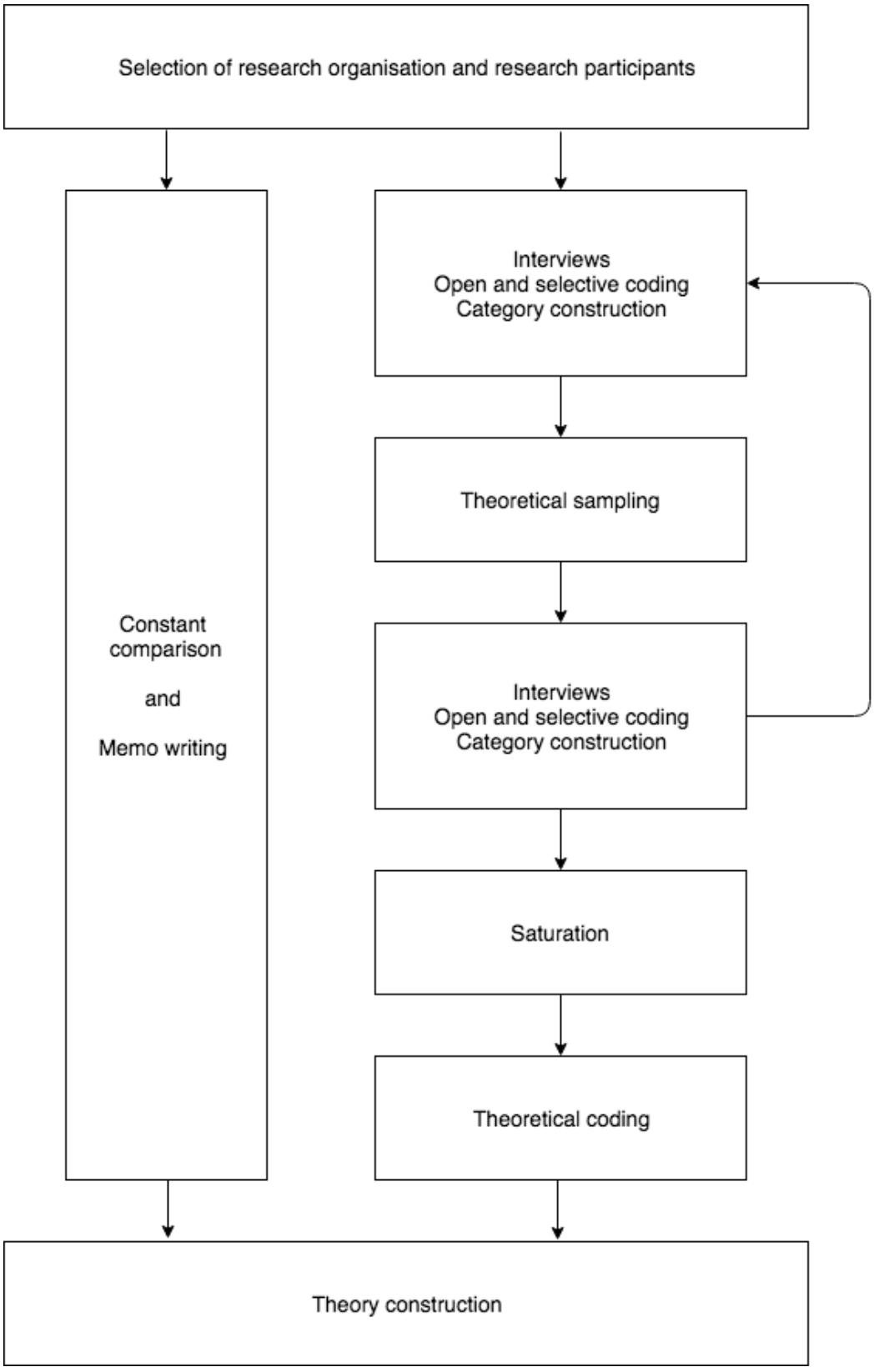



Figure 4.1: Summary of the research method

However, there were more interactions between the method steps than can be shown in a single diagram

### 4.2 Interviews as the data collection tool:

The selection of an appropriate data collection method is crucial to a successful research outcome. This is because *"How you collect data affects which phenomena you will see"* (Charmaz, 2006, p. 15). This project examines a psycho-cognitive process within humans (the acquisition of knowledge), which cannot be revealed by a questionnaire. Also, the process under investigation may not be apparent in people's behaviour, in a way that can be recorded by observing the research participants within the timescale of this study. To ensure the availability of rich data, in-depth (intensive) qualitative interviews were selected for this project:

> *"Interviews are particularly well suited for studying people's understanding of meanings in their lived world, describing their experience and self-understanding, and clarifying and elaborating their own perspective on their lived world"* (Kvale and Brinkmann, 2009, p. 116).

Interviews play a central role in GT research. Most reputable GT studies (Isabella, 1990; Sutton, 1987; Gersick, 1988; Browning et al., 1995) relied on interviewing in one way or another:

> *"Intensive qualitative interviewing fits the GT method particularly well. Why? Both grounded theory methods and intensive interviewing are open-ended yet directed, shaped yet emergent, and paced yet unrestricted. Researchers adopt intensive interviewing precisely because it facilitates conducting an open-ended, in-depth exploration of an area in which the interviewee has substantial experience"* (Charmaz, 2014, p.85).

An important explanation of this fitness is that a researcher assumes more direct control over the data collection process (e.g., by using theoretical sampling - see below). In GT, it is crucial that the researcher assumes reasonable control over the data collection and analysis, to ensure that the whole process is steered towards maturing categories and theory generation (Charmaz, 2006) without influencing the outcomes: *"The interviewer leads the subject toward certain themes, but not to specific opinions about these themes"* (Kvale and Brinkmann, 2009, p. 31). This was an important point for this research. Issues around knowledge (or the lack of it) are naturally entangled with other day-to-day worries and I needed to ensure that the interviews remained relevant to the research questions. This also indicates that interviewing is a craft which is necessary to master in order for a research project to be successful. Having been a medical practitioner for about three decades, I was used to the art of engaging in purposeful conversation with people, and this helped:

> *"Interviewing rests on the practical skills and the personal judgments of the interviewer; it does not follow explicit steps of rule-governed methods. The skills of interviewing are learned by practicing interviewing, and the quality of interviewing is judged by the strength and value of the knowledge produced"* (Kvale and Brinkmann, 2009, p.17).

However, were interviews enough to capture all of the required data? Suddaby argued that *"grounded theory studies rarely have interviews as their sole form of data collection"* (Suddaby, 2006, p. 635). On the other hand, Creswell (2007) argues:

> *"Interviews play a central role in the data collection in a grounded theory study...Other data forms besides interviews, such as participant observation, researcher reflection or journaling (memoing), participant journaling, and focus groups, may be used to help develop the theory...However, in my experience, these multiple data forms often play a secondary role to interviewing in grounded theory studies"* (p. 131).

It is reasonable to conclude that interviews can form the backbone of successful GT research. This should be supplemented, when necessary, with other data collection methods, depending on the phenomenon under investigation. However, in this project, interviews alone were able to provide ample material for constructing a theory with reasonable explanatory power.

The type of interview used in this project is the *conceptual* interview, in contrast to factual, computer-assisted, focus group, narrative or discursive interviews (Kvale and Brinkmann, 2009). This type of interview seeks to clarify concepts and uncover the essential nature of a phenomenon (knowledge acquisition, in this project). The questions posed during such interviews explore the meaning and concept dimension of the central terms, as well as their positions and links within a conceptual network. This could reveal the point of contrast between the respondents' taken-for-granted assumptions and their practice (Kvale and Brinkmann, 2009).

The questions used to direct the discussion during the interviews will be described in the next section and were extracted from and so directly related to the research questions formulated following the completion of the literature review (see Chapter 2). These questions covered the following points:

- How do staff interact/feel about/make sense of their surroundings (written materials, teaching, social interactions etc.) to know important aspects of their jobs?
- What is it like to know something? Do you know certain topics more than others? If so, how? Why?

- What experience do they have in deeply knowing certain topics in their practice, to the extent that their performance has changed?

This project was carried out within one NHS organisation which was chosen because of accessibility and my familiarity with their management arrangements. The selection of the interviewees was important. A good qualitative study requires experienced, “knowledgeable” interviewees who reflect a variety of perspectives (Rubin and Rubin, 2005). In healthcare, specialized medics (consultants) satisfy some of these criteria. They are considered “knowledge” workers; the acquisition and utilization of “knowledge” are their primary concern. They provided first-hand-information about the process under investigation.

A potential hurdle which might jeopardise data collection is the willingness of these experts to dive sufficiently deeply into their experience and understanding of the research phenomenon to be able to provide a detailed description of the process under investigation. As knowledge workers, revealing their understanding of knowledge may be viewed as a quick way of stripping them of power, tremendously exposing their weakness and making them vulnerable. For example, would healthcare experts be willing to admit that, under certain circumstances, they were willing to make important decisions on patient care without possessing appropriate or sufficient prior knowledge (whatever the word 'knowledge' might mean)? This is a limitation of some qualitative research data collection methods, which can be tackled to a certain extent by improving a researcher’s skills and careful preparing the interviews. One way of gaining an interviewee’s trust is for the interviewer him/herself to answer some of the more difficult or sensitive interview questions in a way that encourages the interviewees to share their own views (Aston, 2001). However, in this project, the interviewees were open, provided a detailed description of their practice and were sufficiently critical of such practice to allow the development of a substantive theory.

These are interviews with elites, who bring with them certain issues, such as a power imbalance, usually in favour of strong interviewees rather than the interviewer. Also, researchers must master the language of those elites and study their work circumstances carefully (Kvale and Brinkmann, 2009). This, however, should not be a problem, as I am a healthcare consultant who has gone through the system and completed my medical specialisation. This, however, can be problematic in a different way, as I may bring many pre-formed ideas and assumptions to the process. This has been managed with considerable attention to reflexivity.

### 4.3 Interview questions:

The actual research question for this project, “What is knowledge?”, was not posed directly to the participants at any stage of the interviews. Moreover, it was unclear when designing the interview questions what types of information were required to answer the research questions, so direct or specific interview questions could not be used. Instead, an exploration of the knowledge activities and processes was pursued (Rubin and Rubin, 2005, p.155). It was assumed that knowledge acquisition is a process. A series of questions to cover this process were designed. This assumption was based on GT’s ability to research psychosocial processes (Charmaz, 2014). The interview questions were worded so that they contained minimum presumptions regarding knowledge and its meaning, in an attempt to limit my influence on the participants’ responses. Four main questions were used in most of the interviews, combined with many probes and follow-up questions when required:

- **Can you think of examples of things that you know well? Do you know certain topics more than others?**

This is a broad-scope tour question that invites the interviewees to walk me through their different areas of knowledge (Rubin and Rubin, 2005, p.160). The answers and examples provided formed the background for the rest of the interview. They were used to focus the answers provided to other questions, and ultimately helped to analyse the concept of knowledge as they understood it.

This question required lots of continuation probes. The participants tended to give one example from their professional life and then stop. They were encouraged by probes and follow-up questions to expand their examples to include other aspects of life.

The examples given include knowledge about certain types of viruses and different types of leukaemia as well as about the likely behaviour of members of their family and how to drive a car. The answers provided helped to define the difference between theoretical and practical knowledge.

- **What made you pursue these types of knowledge?**

This is a more focused main question and was intended to explore the early stages of the knowledge process. It was assumed that this question would help to clarify where and why

the knowledge processes starts. The answers to this questions were elicited by using elaboration probes, where the participants were asked to explain their points further.

The interviewees mentioned many motivating factors, which helped the development of motivation as one of the main categories of the emergent theory. Follow-up questions were used to discuss related issues, such as demotivating factors.

- **How these types (or examples) of knowledge developed over time (and space)?**

This is a main question regarding the chronology of the process (Rubin and Rubin, 2005, p.162). This question was intended to map the knowledge pathways and explore the main body of the knowledge process and identify how the participant moved from being not-knowledgeable to being knowledgeable. Sequence and clarification probes were used to define the components of this process.

Follow-up questions were used to understand the temporal nature and variable speed of the knowledge process. How do staff interact/feel about/make sense of their surroundings (written materials, teaching, social interactions, etc.) in order to understand important aspects of their jobs? The complexity of the process and the feedback, both negative and positive, were also explored by using follow-up questions.

This question clarified the knowledge process and also linked all of the other main categories of the emergent theory into a coherent structure.

- **What made you think that you know that?**

This is an opinion main question which was introduced during the later stages of the interviews. This question was intended to help the participant to decide, after debating a few examples, what gave them the knowledge (or the feeling of knowledge).

Probes were used to encourage the participants to think harder about their practice. Follow-up questions were used to request evidence from the participants' first-hand account of their experience. What is it like to know something? What experience do they have of deeply knowing about certain topics in their practice, to the extent that their performance has changed?

This showed how the participants felt that they knew something if they managed to practise it successfully or received positive feedback from their peers about certain modes of

actions. These led to the construction of “peer support” and “practice” as the two main categories of the emergent theory.

The basis on which the interviewees were selected is important. The selection was based on the principle of theoretical sampling, which is a critical concept in GT. This will be discussed next.

**4.4 Theoretical sampling:**

Theoretical sampling is a core concept in GT (Suddaby, 2006) and has been summarised as *“the process of data collection for generating theory whereby the analyst jointly collects, codes, and analyses his data and decides what data to collect next and where to find them, in order to develop theory as it emerges*” (Glaser and Strauss, 1967, p. 45). Theoretical sampling is a conscious and purposeful process. This is because *“by conscious selection of samples groups that are either similar to or very different from the original group and looking at either diverse or similar concepts in the data, we can expand and densify the theory”* (Glaser and Strauss, 1967, quoted in Urquhart, 2013, p.184).

The sampling process was completed by interviewing significant individuals (Baker et al., 1992). A significant individual or good informant, for Grounded Theory sampling, has been defined (by Morse, 1991) as individuals who have the knowledge and experience that are expected to address the research question(s), are able to reflect and articulate their views and understandings as well as have the time to be interviewed and are willing to participate in the study (Cutcliffe, 2000). For this project, selected significant individuals were NHS medical consultants. The number of interviewees, i.e., the sample size, is also an important point to consider. Rubin and Rubin (2005) wrote:

> *“You do not need a vast number of interviewees to increase the credibility of your findings; instead, you have to be able to convince readers that you have interviewed to obtain different points of views and that when brought together these understandings provide a complete picture”* (p. 68).

During this project, a total of 12 interviews were held. The interviewees were selected according to the theoretical sampling principles in order to saturate the theoretical categories.

The first interview completed for this project was with an NHS consultant who had been in post for less than 10 years (recently appointed). It is accepted that the initial interviews are

usually based on general sociological perspectives which link the interviewees with the research area and the expectation that they have a broad general knowledge of the social process under investigation (Glaser, 1978; Morse, 1991b). The fact that this individual had been recently appointed to a consultant post had affected the individual's understanding of his/her work knowledge. The individual was, until recently, in training and this was another variable which enriched the data collection. The individual was close to his/her training years and so this influenced how he/she engaged with knowledge. This consultant differed from the more senior staff so the inclusion of both groups should enrich the collected data. Because of this, and following the first interview, duration in post was used as a criterion for selecting further interviewees; as Urquhart (2013) explained: "*The analysis of data was used to decide where to sample from next*" (p. 8).

Also, this consultant's job was based on supervising clinical laboratory services (rather than directly treating patients). Laboratory services affect patients and this consultant's job was to advise other clinicians on the best utilisation of the lab resources as well as how to interpret the lab results in relation to patients' clinical symptoms. This interviewee was particularly informative because of the continuous knowledge exchange that occurred between him/her and other clinicians. The concept of "comparing one's own knowledge with others" emerged from the first interview as well as the subsequent ones. This concept was used to inform the theoretical sampling. This is because *"The emerging concepts direct future data collection*" (Urquhart, 2013, p. 8). As Day (2007) explains: *"The basic idea is to sample new settings which might illuminate through further comparison the properties and relationships of emerging categories"* (p. 186). These two criteria (time spent as a consultant and the type of job in relation to the use of knowledge) were used as a sampling strategy for selecting further interviewees. This is because *"a sampling strategy needs to exist"* (Urquhart, 2013, p. 65).

The completion of a combination of interviews to cover these criteria ensured that the generated theory could be applied to both junior and senior consultants, including those who work directly with patients as well as those who interact with knowledge through advising others.

> *"Theoretical sampling…Gives the option of sampling other substantive areas, to increase the scope of the theory" (Urquhart, 2013, p. 61) and also "Theoretical sampling…ensures that the theory will be comprehensive"* (Urquhart, 2013, p. 134).

As explained above, the analysis of the first interviews highlighted the direction which the further sampling needed to follow (Cutcliff, 2000).

Theoretical sampling in Grounded Theory can be of two types: wide and diverse, or focused (Glaser and Strauss 1967). Cutcliff (2000) explains:

> *"[an] issue in sampling that warrants attention is that of the choice between wide and diverse sample or a more focused, narrow, concentrated sample"* (p.1478).

The choice is directed by the conceptual level of the theory which the researcher intends to construct. For this project, it was assumed that a highly focused theory, which is limited to one type of consultant work at the same level of seniority, may be too narrow to be informative. On the other hand, a wide ranging theory, which includes all types of consultants at all levels of seniority, might have been impossible to develop within the time frame of this project. Hence, a set of three interviews was held with recently appointed consultants with a laboratory focus, and another set of interviews was held with senior consultants (who had been in post for at least ten years), who were also supervising laboratory services. These interviews captured new information related to being longer in post, together with the effects of "experience" and being away from formal training for a longer period of time.

> *"Researchers deliberately seek participants who have had particular responses to experience, or in whom particular concepts appear significant. These participants are then asked to tell their story, adding to the existing data set about a particular concept or category"* (Morse, 2007, p. 240).

A third set of three interviews was completed with recently appointed consultants (in post for less than ten years), whose job was clinically focused; i.e., they directly use knowledge to interact with and treat patients and so their understanding and use of knowledge may differ.

> *"Theoretical sampling is the disciplined search for patterns and variation"* (Wiener, 2007, p. 304).

A fourth set of three interviews was completed with senior consultants whose focus was also on direct patient care. The selection of the interviewees, based on their duration in post and focus of their job, was developed during the data collection and analysis process to capture the effects of these variables on the understanding of knowledge and avoid the collection of repetitive data which could cause early and undesirable saturation.

> *"In this way, the researcher can continually adjust the control of data collection to ensure the data's relevance to the emerging theory*" (Glaser and Holton, 2004: para.51).
>
> "*Theoretical sampling consists of collecting data that will advance the theory"* (Stern, 2007, p. 117).

From the knowledge management point of view, it is reasonable to consider NHS consultants as a "community of practice" (CoP). This concept has been widely investigated in the literature (e.g., Amin and Roberts, 2008; Hughes et al., 2008; Hislop, 2013). A community of practice is defined as "*informal groups of people who have some work-related activity in common*" (Hislop, 2013, p. 155). Although NHS consultants are a formal group from the service delivery point of view, their links regarding knowledge are, to some extent, elusive, and so these consultants represent an informal community of practice. The differences between CoP and organisational work teams, as explained in Hislop (2013, p. 156), would confirm this assumption.

The effects of the degree of seniority of the different members within the CoP have been described in the literature, and so it was felt that seniority is an important selection criterion which could inform the theoretical sampling. Lave and Wenger (1991) described the 'triadic' group relations. These include masters (old timers), young masters (journeymen) and apprentices (newcomers). Members of a CoP undergo a process of 'legitimate peripheral participation', in which newcomers are introduced gradually into the group and move up the ladder of seniority (Lave and Wenger, 1991). Issues with 'power conflicts' (Fox, 2000) and the resulting difficulties that can face newcomers as well as the possible threat to replace 'old-timers' have been highlighted (Contu and Willmott, 2003; Lave and Wenger, 1991). Seniority in the job is an important factor in terms of how workers feel and act and so it has been used as a selection criterion for the sampling in this research.

Time brings change to an organisation such as the NHS. Such change could be seen as a threat by seniors but considered an opportunity by newly-appointed consultants, so it cannot be assumed that these two groups will respond in the same way to change (Hislop, 2013; Handley et al., 2006), so both groups were interviewed. These views give credibility to the theoretical sampling that emerged during the analysis of the data for this project. The selection of senior and newly-appointed consultants should increase the conceptual level and generalisability of the constructed theory.

Given the fact that NHS consultants come from different specialties, a question will arise as to whether they represent one CoP or several different CoPs. Laboratory-focused and clinically-focused consultants could have different approaches to knowledge and they may represent two different CoPs. Within the NHS, these two types of consultant usually work together in multidisciplinary teams. There are several studies (Currie et al., 2008; McGivern and Dawson, 2010; Oborn and Dawson, 2010) on multidisciplinary teams, all of which indicate that multidisciplinary teams represent a cross-community and boundary-spanning situation (Hislop, 2013). After all, laboratory-focused and clinically-focused consultants represent different groups of knowledge workers. The theoretical sampling for this project led to the selection of both groups, which increased the scope of the research conclusions.

### 4.5 The selection and use of coding procedures:

The process of coding was defined as *"the term used for attaching conceptual labels to data"* (Urquhart, 2013, p.35). During this project, all of the interviews were transcribed in full and coded line by line using Urquhart's (2013) coding advice, which was based on the Glaserian version of GTM (Glaser, 1978). These include open, selective and theoretical coding. Open codes are labels (which should be as theoretical and abstract as possible) that are attached to small pieces of interview data. The open codes are then organised, scaled up and grouped into a smaller number of selective codes which are more focused and relevant to the developing theory. The selective codes are then related to each other during the theoretical coding to construct a theory. This was based on Charmaz's (2014) advice to: "*keep coding simple, direct and spontaneous"* (p. 113).

Two important features were used in the coding of this project to ensure adherence to GTM. Firstly, concepts from the literature were not used to guide the coding and the codes were suggested by the data. This ensured that the codes were obtained from the interviews and not forced by preconceptions gained from the literature (Urquhart, 2013; Holton, 2007). Secondly, coding was applied to a detailed level of data which was line by line (or sentence by sentence). This is also known as bottom-up coding (Urquhart, 2013, p.38). It helped to capture the most important concepts and produce a rich panel of codes.

As per GT practice, the data collection was simultaneously accompanied by the coding and analysis. This helped to identify gaps in the data that could be filled during future interviews. The whole process of coding in GT can be summarised as follows:

*"When we attach a particular label to a particular chunk of data, we start to analyse that data. If we start to link together these codes in relationships, we can start to theorise about the data" (Urquhart, 2013, p.35) … A theory is a relationship between constructs…Coding helps us build those constructs" (Urquhart, 2013, p.36)*.

The Glaserian open, selective and theoretical coding (Glaser, 1978; Urquhart, 2013) is explained in the following diagram:

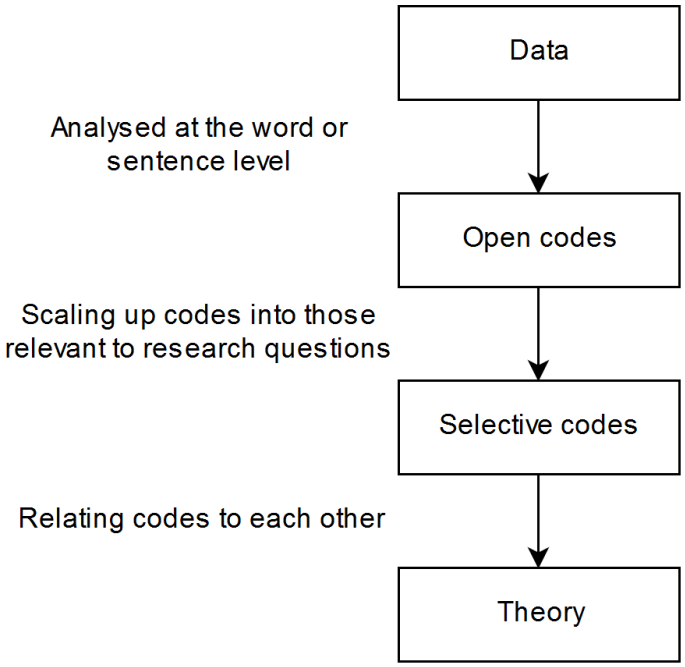



Figure 4.2: The coding process from data to theory

**Open coding:**

Open coding "*is the process of assigning codes to a piece of data*" (Urquhart, 2013, p.45). The process of open coding is iterative and reflective in nature. The transcripts were read repeatedly and attempts were made to see behind the words. This helped to satisfy two important features of GTM, which are:

Firstly, moving codes from being descriptive to analytic as far as possible. Analytic codes give better insights into the data, allow more meaningful selective codes and capture deeper interpretations. For example, the participant in interview A said: "*Professors may*

*have been in the field for the last 30 years or so. You can't compare your experience with them but at least you can learn from them"* (Interview A).

A descriptive code was: "comparing oneself with others".

A more analytic code was: "positioning self in a knowledge hierarchy".

Secondly, the process allowed continuous comparison throughout the coding process. New codes were constantly compared with the existing ones, and codes - old and new - were developed, merged or elevated to more abstract levels.

The full interviews were recorded and transcribed. The transcripts were then coded, sentence by sentence (Charmaz, 2014, p.125). Reflection on the different codes led to the elevation of codes from simple description labels to more analytic codes. Some codes were left as descriptive because it was felt that a simple description would provide a more honest reflection of the meaning of the data. Between 120 and150 open codes were constructed following each interview.

**Selective coding:**

During the process of selective coding, *"the open codes are organised into selective codes that will eventually contribute to the core categories of your theory…selective coding is a process of scaling up your codes into those categories that are important for your research problem…there is quite a lot of grouping to do at this stage"* (Urquhart, 2013, p.49). Open coding usually results in large numbers of codes and multiple categories. Selective coding should manage these without losing important meanings and ideas and allow the identification and support of the core categories. During the selective coding, the following measures were implemented:

- More dimensions of the research problems were discovered (Urquhart, 2013, p.50). The main categories of this project, discussed in Chapter 4, were produced in this way.
- Theoretical memos were written to help to theorise about the categories.
- Further theoretical sampling was completed.
- The 'core' variables were identified, which were developed into one core category, which is 'building confidence as a process of knowledge acquisition'.

Selective coding is the second stage of coding in the Glaserian version of grounded theory and involves grouping the codes into higher-level categories, with the core category or categories in mind (Urquhart, 2013, p.193).

The open codes were carefully examined, with a particular interest in exploring the following (Urquhart, 2013, p. 49):

- Codes that could be more relevant than others to the research question ("What is it like to know something?").
- Codes that are consistent; i.e., they support each other in exploring a particular meaning.
- Codes that contradict each other; i.e., they show inconsistency in the data which requires further exploration in future interviews.
- Codes that relate to each other and support a higher analytical code; i.e., codes that explain and act as the dimensions (or properties) of a higher code.

Eventually, selective codes should be grounded in the data, represented by enough open codes so that their dimensions can be defined, lie within the research discipline and are relevant to the research questions (Glaser, 1978). All six selective codes constructed in this project satisfy these criteria (see Chapter 5).

**Constant comparison:**

During the coding for GT, the researcher is required continuously to compare the data with the data, the data with the codes and the codes with the codes. *"This constant comparison of the incidents very soon starts to generate theoretical properties of the category. The analyst starts thinking in terms of the full range of types or continua of the category, its dimensions, the conditions under which it is pronounced or minimized, its major consequences, its relation to other categories and its other properties"* (Glaser and Strauss, 1967, p.106). Constant comparison was utilised in the analysis of the interviews and it revealed the following:

- Some codes and data were repeated on more than one occasion in the same interview and in subsequent interviews.
- On many occasions, the same open code gave the dimensions and properties to several selective codes. This indicates some coherence within the data and codes and proves consistency within the meanings provided by the participant.

- Contradictory codes and data were also occasionally observed. For example, some codes suggested that exam results are not indicative of knowledge, whilst other codes indicated that passing an exam indicates the possession of a minimum amount of knowledge. Also, some codes expressed trust and respect regarding published papers, while others questioned published work. These contradictions or inconsistencies may not be genuine and were probably due to a lack of time and space for the participant to elaborate more about these complex topics. Continuous comparison with subsequent data helped in exploring these ideas.

The selective coding of the interviews led to the construction of six main categories (or selective codes) which captured the main ideas expressed by the participants in relation to the research question. These selective codes are directly grounded in the primary data. The process of selective coding should now lead to the theoretical coding, which is the final stage of building theory in the GT methodology.

**Theoretical coding:**

Theoretical coding works by linking categories together to construct a theory. The full and conclusive theoretical coding, which led to a theory, is presented in Chapter 4. *"Theoretical coding is when we relate the codes to each other and look at the nature of the relationship between those codes. This is what builds the theory*" (Urquhart, 2013, p.26). The idea is to identify the relationships within our data. There are a few ways to identify the relationships between the categories (Urquhart, 2013, p.50). These include:

Firstly, other categories can represent relationships and these have been identified through the writing of theoretical memos which encouraged the theorising process. Urquhart (2013) writes: *"You can – and, I think, should be able to – generate your own coding paradigms*" (p.26). For example, in this research, one of the main categories, 'the process' of knowledge acquisition, was used to link three other categories including the core category; these were: peer influence, practice and confidence building (see the next chapter).

Secondly, Glaser's Theoretical Sensitivity (1978) provides many ideas (38 families) about the different ways of relating categories in order to build a theory. Many of these families of codes were used during the construction of a detailed theory, as explained in the next chapter.

Thirdly, the literature can also be a source of ideas; e.g., Spradley (1979), as suggested by Urquhart (2013). However, codes from the literature (other than Glaser's families of codes) were not used in this research. Codes from the literature were not required, and it was also felt that their use could force ideas from the literature into the research findings.

The use of diagrams can facilitate the thinking about relationships. Integrated diagrams (Strauss, 1987) were used extensively in this project to help with the theorising and the linking of codes, categories and concepts into coherent themes, which is the basis of building a theory. Diagrams can be defined as "*a visual device that furthers cumulative integration*" (Urquhart ,2013, p.114). Strauss (1987) explains that there should be a succession of these diagrams which build on each other "*through a process of testing and questioning*" (Urquhart, 2013, p.114). The use of diagrams to build a theory is demonstrated in the next chapter.

**4.6 Memo-writing:**

Memo-writing is a journal of the researcher's thought process that contributed to the research outcomes. I wrote memos from the early stages of this project, based on Charmaz's (2014, p.162-163) and Urquhart's (2013, p. 120) guidance. Around 47 memos were completed Most of the memos were in written form and nine were graphic, involving boxes and arrows. A full description of the memo-writing process, the characteristic of memes and an example of a completed memo are presented in appendix I.

**4.7 Criticism of GT and how this was managed during this project:**

Grounded theory is a commonly used qualitative research method; however, its use was associated with two major concerns.

Firstly, researchers may use incomplete methodologies and claim that they have developed a theory. An incomplete methodology may include ignoring one of the basic steps altogether or failing to utilise the steps to their full potential. These steps are: constant comparison, theoretical coding, theoretical sampling, theoretical saturation and theoretical sensitivity (O'Reilly et al., 2012). The problem here is that an incomplete methodology may lead to themes but not theories

Secondly, researchers may use certain aspects of the grounded theory methodology (mainly coding) with no intention of generating theory. Some may call this a grounded

approach. Although Strauss finds this flexible approach acceptable (Jones et al., 2007), for the novice, this will make it difficult to differentiate between what is and what is not grounded theory research. Some 'grounded theory' publications have failed to adhere to the majority of the grounded theory procedures and techniques. This may undermine grounded theory as a research methodology and imply that this is a situation in which 'anything goes' (Jones et al., 2007).

These concerns were brought to light and strategies to manage them were suggested by recent key publications (O'Reilly et al., 2012; Jones et al., 2007; Suddaby, 2006). In this research I adopted a full grounded theory methodology, in which a systematic approach, using Urquhart (2013) and Charmaz's (2014) work, was followed to construct a theory on the meanings of knowledge as viewed by healthcare professionals.

### 4.8 Ethical considerations:

The ethical assessment of this project was completed by Sheffield Hallam University – Sheffield Business School REC (05 Aug 2013). Evidence of a favourable scientific review was provided by Sheffield Hallam University Research Degrees Sub-Committee (27 Sep 2013). A Project Authorisation (NHS Permission for Research to Commence, STH ref: 18057) was issued by the Director of R&D, Sheffield Teaching Hospitals NHS Foundation Trust on 28 October 2013. Moreover, the documentation, approval and practice of this project were audited by the university as part of a random sample of projects in July 2014, according to NHS research governance. Although some qualitative research projects change direction midway and require further or updated ethical assessment (King and Horrocks, 2010), there were no significant changes to this project's research questions, methodology or study cohort that would require any further ethical consideration. Appendix II contains the research authorisation and ethical approval.

### 4.9 Conclusion:

The GT literature provides the detailed research steps to ensure the grounding of the emergent theory in empirical data. In this project, medical consultants were interviewed to research the concept of knowledge in healthcare services. The interviews were transcribed in full and coded line by line using Urquhart's (2013) coding advice which were based on the Glaserian version of GTM (Glaser, 1978). This included the use of open, selective and theoretical coding. The process of coding was used to build the concepts that were then related to each other to build a theory.

This chapter has also covered how important components of GTM, such as theoretical sampling, constant comparison and memo-writing, were used to ensure the saturation of the constructed categories. The ethical approval of this research was described and a note on reflexivity was provided to define the researcher's influence on the research.

The research method used in this project yielded a substantive theory which links the concept of knowledge to the participants' feeling of confidence. This will be discussed in detail in the next chapter.

# Chapter 5
# Research Findings:
# The Main Categories and the Theory

My *interpretation* of the data (interview transcriptions) led me to a new *understanding* of the *meaning* of knowledge.

## 5.1. Introduction and Summary:

The coding of the interview data led to the construction of five main categories. Together, these categories support a sixth, more central 'core' category (which relates knowledge to confidence) in constructing a theory regarding the process of knowledge as understood by the research participants. This chapter presents all of the categories and provides data regarding their relevance as well as describing the constructed theory.

Following this brief summary of the findings (section 1), this chapter present the core category of building confidence and outlines its features and dimensions (section 2). This is followed by a description of the constructed theory, including presenting the relationships of each category to the core category in order to establish a theory, the mutual relationships between knowledge and confidence as well as presenting the dynamic nature of knowledge and the findings regarding imperfect knowledge (section 3). This is followed by a detailed presentation of each of the five supporting categories. These are: motivators, knowledge sources, knowledge process, practising skills and peer influence (section 4). The theory is then presented in the form of integrative diagrams to demonstrate the links between its various components (section 5). The chapter ends with a conclusion (section 6). To support the findings, quotes from the interviews were included so that the reader can see how the category and the theory were constructed from the primary data. However, the categories and theory were constructed using open and selective codes, as explained in the methodology chapter.

The following diagram presents an initial overall view of all of the categories:

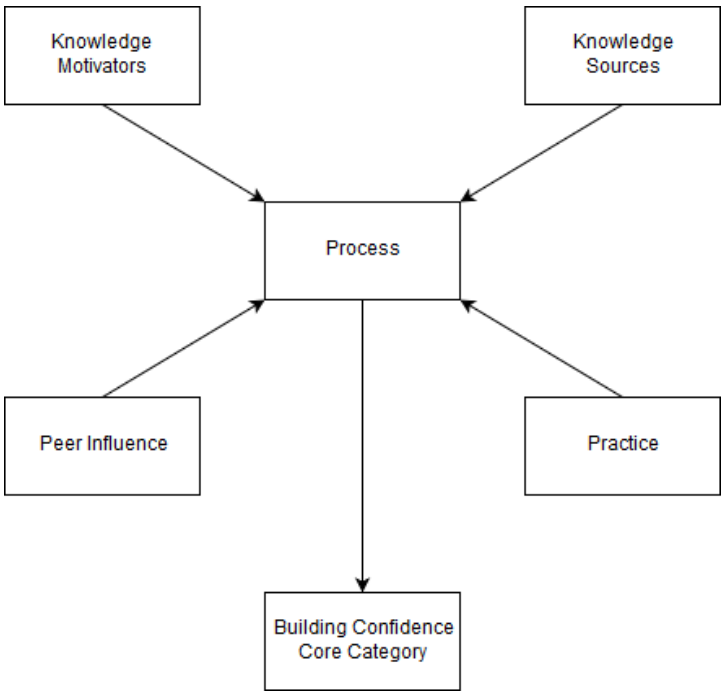



**Figure 5.1**: A diagrammatic representation of all of the categories.
Further diagrammatic representation of the theory is presented in section 5 below

**The core category: Building confidence**

The essence of the core category is that the process of knowledge acquisition aims to build confidence in the available information and/or skills. People can be aware of the existence of many things in life but do not necessarily consider themselves knowledgeable about such things or think that they can make use of such awareness. This awareness can become knowledge once people develop confidence in what they are aware of and how such awareness can be used. Confidence transforms awareness into knowledge. This confidence can be obtained through the approval and agreement of relevant others, usually credible peers, or through the direct use of such information or skills to obtain feedback that helps to build confidence.

**Summary of the Theory:**

The coding of the interviews allowed the construction of a substantive theory to explain what knowledge means, as understood by medical consultants in the NHS. The emergent theory argues that knowledge is the result of a continuous, complex process that is

triggered by motivating factors and sustained by the presence of sources of knowledge. One of the aims of the process is to build confidence in what we are aware of (our information) or what we can do (our skills). One knows something or how to do something if one is *confident* that one knows it or knows how to do it. Someone who understands a subject very well or has the ability to complete a task successfully but lacks confidence simply does not know the subject. On the other hand, people can be overconfident or have completely unjustified, misplaced confidence in situations where they lack understanding or ability. According to the emergent theory, they are still knowledgeable, albeit in an incorrect or negative way. Confidence is an important component of our knowledge.

Two main sources of such confidence were expressed during the interviews. *Firstly*, the agreement and support of peers and/or experts in the field (i.e. peer influence) seem to be a major source of confidence for this group of staff (medical consultants). Such boosts to confidence can be made by examiners following a successful exam result. *Secondly*, hands-on-practice of such understanding or information in a real situation (direct practice) is an effective source of confidence. For medical staff, trying out certain skills and obtaining immediate feedback on such trials is an effective way to reinforce our knowledge

According to this understanding of the meaning of knowledge, the process of knowledge management should aim to build staff confidence and ensure the justification and sound basis for such a feeling (confidence) as well as continuously managing the notion of overconfidence or misplaced confidence (see chapter 7). This is different from the current understanding of knowledge which views it as either objective information that requires cognitive processing or as human behaviour that influences practice. According to the emergent theory, an important component of knowledge is a fallible emotion which can be harder to measure, observe or control. Similar to other human emotions, knowledge fluctuates and responds to one's surroundings. This makes the knowledge process highly dynamic in nature. Moreover, the process can go wrong, particularly if its routes (peer influence and practice) are weak or ineffective (see Chapter 7). Overconfidence can create a sense of false knowledge, which can be very influential and practically constitute a type of knowledge in itself. The following diagram summarises these categories into a theory:

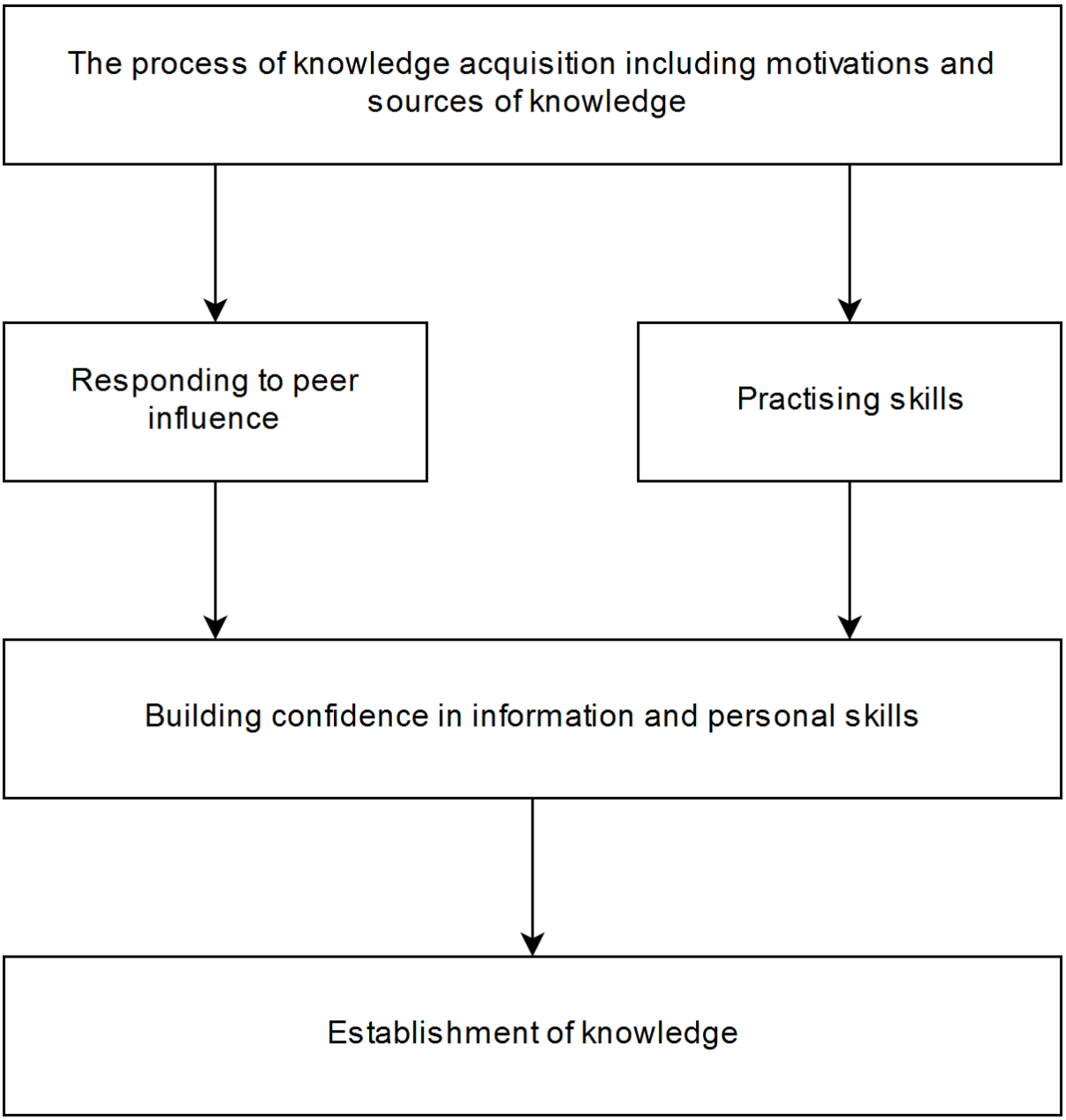



**Figure 5.2**: Diagrammatic representation of the main categories as a theory

### 5.2. The core category of building confidence:

The category around '*building confidence'* has been selected as the core category for the construction of a theory in this dissertation. An examination of the core category revealed that it possesses the following features:

1. This category gives explanatory power to the theory; i.e., it can explain what knowledge is and this addresses the research question directly.
2. 'Building confidence' is the most mature category, that follows from the knowledge acquisition process. It is a conclusion and an end in itself rather than a means to further categories. This has allowed it to account for the variation in the views and behaviour of the research participants.
3. Similar to other categories, it is well grounded in the data and there is evidence from the interviews to ensure an adequate level of saturation.
4. The other five final categories in this research are strongly linked or directly lead to this category, as shown in Figure 5.7 and Figure 5.8
5. Building confidence is a useful concept. It can be used practically to understand and manage certain problems related to knowledge acquisition and its utilisation in health care (see Chapter 7).
6. More importantly, this concept represents the contribution of this dissertation to the existing knowledge within this discipline. Arguing that confidence is a source of knowledge is new in the field of knowledge management and this should open the door to more insights into how knowledge is acquired and managed. This is presented as a new contribution to the existing knowledge.

#### Building confidence: the dimensions of the core category:

The essence of this category is that people can be aware of the existence of many things in life but do not necessarily consider themselves knowledgeable about such things or think that they can make use of such awareness. This awareness can become knowledge once people develop confidence regarding what they are aware of and how such awareness can be used. Confidence transforms awareness into knowledge. Such confidence can be obtained through the approval and agreement of relevant others, usually credible peers, or by the direct practising of skills and/or using information to obtain feedback that helps to build confidence. According to the conclusions of this research, confidence is not only an essential feature of knowledge but also a sufficient criterion for knowledge. Humans maintained for many millennia that the earth was flat. Such knowledge was maintained by their confidence in their senses.

In defining what confidence is, one of the interviewees said:

"*I think confidence is that you have the ability to do something or say something with conviction and you can back it up and you feel in your head that you are doing the right thing. It's also not only in your medical life but it's also in your personal life*" (Interview K).

The following dialogue took place when an interviewee stated that they were knowledgeable about treating a particular disease:

"*Interviewer: What makes you think so?*
*Interviewee: More confidence.*
*Interviewer: So you feel confident. What gave you that confidence?*
*Interviewee Exposure to different types of patients.*
*Interviewer: When you treated them, how did it give you the confidence?*
*Interviewee: Response* [meaning the patients' response to treatment]."
(Interview I).

One interviewee explained how expertise relies on confidence rather than on theoretical information:[15]

"*So you are only an expert inasmuch as your confidence, so it may be true that, academically I am less familiar about gene therapy or some of the new treatments…but I am more confident the more experience I get in how to manage patients which is slightly different from academic knowledge*" (Interview L).

The following quote summarises the importance of confidence in clinical practice. The interviewee referred to knowledge but meant information. The picture becomes clearer if 'knowledge' is replaced by 'information' in the quote. The last sentence would then read: "*You need information to build knowledge (confidence) but just information is not knowledge*". This explains the essence of the emergent theory which is based on building confidence based on reliable information:

"*So knowledge is that you know the subject, but I feel that confidence is when you can apply your knowledge to manage the patient. So, just having the knowledge, you may still be unable to apply it appropriately to the patient. So I think, when you've applied that skill to convert your knowledge into the application of management, then you get confidence. Without knowledge, you can't be confident but just having knowledge is not confidence, in my opinion*" (Interview K).

The line-by-line coding, used in this research (see Chapter 4), resulted in a large numbers of codes. The following table provides examples of the codes that underpin the core category.

[15] The interviewees usually use knowledge to describe information and an awareness of facts.

| Open codes | Subcategories (Dimensions/Properties) | Selective code (Core category) |
|---|---|---|
| Making correct decisions gives confidence<br>Gradual practice builds confidence<br>Considering workload as a source of knowledge<br>More work, more experience<br>Practice-learning association<br>Feedback (from practice) changes confidence | Obtaining confidence from practice | Building confidence |
| Relating self to others<br>Positioning self into a hierarchy<br>Reading about other people's work<br>Comparing self with others<br>Expert people as an excellent source of knowledge<br>I know more if others know less<br>Disagreement damages confidence<br>Effects of positive and negative people around us | Peers' influence on our confidence | |
| My knowledge goes up and down<br>Contextual nature of knowledge<br>Knowledge is relative<br>Knowledge has more than one aspect<br>'Confidence is cyclical' | Changing confidence: a dynamic process | |
| Good confidence does not mean correct knowledge<br>Admitting ignorance<br>Agreeing ignorance<br>Accepting limitation of one's knowledge<br>Reacting to being wrong<br>The unaware ignorant others | Ignorance damages confidence | |

**Table 5.1**: Example codes constructed for the core category

The following is discussion of the dimensions of this category.

**Dependence on Practice[16] as a dimension of this category**:

Practice is one of the two main direct routes to building confidence. The interviewees commented:

"*What gives you confidence is making decisions about treatment and then them turning out correctly, or them not turning out correctly but you learning something from them…you learn more from personal experience than you do from reading*" (Interview L).

"*Things come gradually. The more cases you manage, the more confidence you have in yourself to manage*" (Interview J).

Some of the interviewees provided examples of how practice is important in enhancing confidence and hence knowledge:

"*I haven't done a bone marrow biopsy for many years now. Someone else does it in the department, so I'm definitely less confident now about a bone marrow biopsy; or, for example, I haven't put a central line in for 15 years so there is no way that I'd even try and do it. I've the skill and I was confident but if I haven't done it for so long I'm not going to do it now. Yes, you lose your confidence. You don't lose the knowledge so you still know knowledgeably that this is the point where you put the needle in, so you have the knowledge but you lack the confidence*" (Interview K).

"*You could go and read about something and have no practical experience of it at all and you might not be any good. You could go and read a car maintenance [manual] and you could say, 'Yes, I know exactly how my car works', but if you say 'Go and change the timing belt!'…you can read things and you can understand what you have read and you can understand how the internal combustion works, but I'd also say a mechanic not only needs that knowledge, he also needs that confidence about how to do it, and I think that medicine is an arrogant sort of thing*" (Interview L).

The difference between theoretical information and practice is clearly expressed:

"*Well, I think there are two aspects to it. There's the sort of academic knowledge which you can acquire through reading…but what really makes you an expert, I think, is the practical aspects, and that you get through managing people and you get experience*" (Interview L).

However, practice as a source of confidence can be a slow and therefore ineffective way to knowledge. This limitation is explained below:

[16] Further quotes, linking practice to confidence building, are provided in section 4 below.

"*Feedback [in clinical practice]. The pace is very slow…if you know straightaway that you were wrong, obviously you won't do it again but, if you only find out a year later that you were wrong, then that's a whole year's worth of risk that you've taken*" (Interview A).

The interviewees explained that practising certain skills increases the confidence of the practitioner due to the observed feedback. The dependence on feedback from practice is a feature of confidence building.

**Dependence on peer influence[17] as a dimension of this category:**

The interviewees explained how their peers influenced them:

"*By observing, more than anything else. You observe how other people are managing patients, treating patients, communicating with patients, and this is the kind of thing*" (Interview J).

"*I compare myself with my peers in exactly the same situation*" (Interview A).

"*It is relative to the knowledge of the person you are talking to*" (Interview A).

"*It* [passing the exam] *confirmed that everybody else thought I knew enough about it*" (Interview B).

"*You have to actually get agreement from your peers that, yes, it's a good idea and it's safe to use and it needs to be approved by everybody*" (Interview B).

"*I think that having the peer group there is definitely beneficial*" (Interview D).

Turning to colleagues for help can be more effective than trying to search for information elsewhere:

"*It's probably more lengthy because you might not find the answers you are looking for. I think people with experience would help. Colleague interaction*" (Interview I).

The following quote explains how collective decisions make one an expert:

"*If we're going to do a clinical trial, we talk…and maybe what makes you more expert is, I think, collective discussion and knowing stuff that's not accessible simply by doing a Google search*" (Interview L).

Confidence is related to others and so dependent on them. People may feel threatened by confident colleagues as well as reassured by colleagues who agree with them. This is explained in the quotes below:

[17] See below for a detailed explanation of peer influence.

"*Yes. I can be in expert in, say, the use of [a medication] but there will be other people in Europe who've the ability to use [that medication] outside the very strict licensing rules*" (Interview E).

"*It's reassuring. I'm faced with a situation and I don't know what to do…and actually, it's not me; it's the situation…I think it's reassuring when everyone else is saying the same thing*" (Interview G).

However, peer influence is not always positive or constructive. The following quotes explain how peer influence can threaten or damage one's confidence:

"*I think they can influence you both ways, so they could disagree with you repeatedly and undermine you, so that undermines your confidence…and then they could also seek advice from you because they think you are competent and knowledgeable, and then that makes you more confident because you think that, if people are seeking you out, you're giving advice to them and they are taking your advice and applying it, then that boosts your confidence, but other people who are also within the remit of your subject still want to take advice from you*" (Interview K).

"*Sometimes, if someone starts interfering with your thought processes, they make you feel nervous and, in fact, you're more likely to misjudge it but, if you've somebody with you, that makes you feel comfortable and is a bit of reassurance for you, and you can then feel more comfortable to learn*" (Interview C).

*"[The presence of colleagues around you] can make that experience awful if you feel that your colleagues around you are critical about what you've done*" (Interview C).

**The dynamic nature of confidence as a dimension of this category:**

Confidence can grow or collapse, can move between people and/or change.[18] It is a dynamic feeling. Growing confidence is explained by the following quote:

"*It's now being reinforced* [the feeling that the interviewee knows about leukaemia] *at work by now. Everyone sends their patients to me and I'm starting to get phone calls*" (Interview F).

Different confidences bring different 'knowledges' and so create different experts:

"*I might feel perfectly confident about managing someone with VWD[19] but, if they're a vulnerable adult, as some of them are, I'm very unconfident about managing vulnerable adults, therefore that's where the social worker'll be very useful…it's different and therefore that's an overlapping area of knowledge or expertise where I am less confident than somebody who is professional in that area*" (Interview L).

The dynamic, changing nature of confidence is well explained in the following quote:

[18] Issues such as information overload can damage confidence, and these issues were mentioned by the interviewees; see section 4 below.
[19] A type of bleeding disorder.

"*Confidence is cyclical so…you have periods of time where you are functioning well and your decisions appear to be good and then, at some point, you either get things slightly wrong or things don't go the way you predicted, and then you swing the other way a bit, so you lose confidence in your decision-making, and I think confidence about clinical decision making is cyclical…but then your confidence builds up again and you feel happier making decisions until the next time that something slips through the net or doesn't quite function the way you thought it did*" (Interview H).

**Lack of confidence, unjustified confidence and the concept of ignorance as the dimensions of this category:**

If knowledge is confidence (the essence of the emergent theory) and a lack of confidence is a lack of knowledge, does a lack of confidence then equate to ignorance? An unconfident person may not be knowledgeable but is not necessarily ignorant. One interviewee expressed his/her shaky confidence as follows:

"*Even though my experiences and knowledge are probably well and truly above a lot of other people's because I specialise in this area, I'm always very hesitant to claim that I'm an expert*" (Interview E).

This interviewee is unlikely to act in a dangerous or arrogant manner. It seems that, if one is confident, one is knowledgeable. If one is unconfident, one is not knowledgeable. There is a situation when one is wrongly confident and so is knowledgeable in a wrong, damaging way. The following quotes explain this concept:

"*It was very funny and it was slightly terrifying that there were a lot of people out there who seem to react to a very primal belief in their abilities without the knowledge behind it*" (Interview D).

"*I've seen my colleagues giving wrong advice in my particular position with confidence*" (Interview A).

There is a difference between someone who does not know and therefore may seek knowledge, and someone else who 'knows' incorrect, baseless and sometimes damaging ideas and continues to disseminate them. The latter is still ignorant, based on incorrect rather than a lack of knowledge. One of the interviewees explained this scientific ignorance very well:

"*I think there are some people who are supremely confident but they don't really have the knowledge base to back it up. And you have other people who are actually very knowledgeable but lacking in confidence…It was quite obvious that they didn't really have a lot of knowledge to back up that confidence…It was pitiful, it was worrying, it was very funny and it was slightly terrifying that there're a lot of people out there who seem to react to a very primal belief in their abilities without the knowledge behind it…[a*

*colleague may make] a very confident decision that I'm not sure I agree with and I can qualify my decision but they can't. Which to me suggests that actually their knowledge was lacking rather than my knowledge lacking in a particular area*" (Interview E).

The problem of unjustified confidence leading to dangerous knowledge is common and seen 'all the time'. Another interviewee explained:

"*I think confidence without knowledge is a very dangerous proposition and you see problems with that all the time. It's obviously most explicit, for example, in surgeons who are confident in their ability to do surgery but are doing the wrong surgery or are doing out-dated surgery…the whole purpose of re-validation is to try and prevent people who are confident but not knowledgeable…I suppose becoming a professional is going from being knowledgeable to being knowledgeable and confident. That's what trainees go through*" (Interview L).

In conclusion, for one to move from being aware of something to being knowledgeable about it, one needs to develop confidence in what one knows and in one's ability to apply skills. Such confidence is built through seeking peer agreement or by practising skills and activities. Some staff can build baseless confidence and so have an unjustified sense of being knowledgeable.

**5.3. The Theory:**

The codes from the interviews showed that individuals can be 'aware' of something, such as a particular practice or certain information, but may not necessarily consider themselves as 'knowing' such a thing. To know something requires more than simply an awareness of it. One of the interviewees explained how they may know (be aware of) a certain drug and "*need to know now in detail how it will work*"; i.e., become knowledgeable about it:

"*I probably acquire more knowledge now, even every week, than I actually did because there is more knowledge to acquire, more is known so I'm increasingly aware that there're things that I don't know, or I need to know more about…I'm beginning to come across examples of patients where what I have heard about that drug might fit their particular needs, so what I need to start looking at now is looking at the patient I've in front of me and going and looking at the information about that particular mode of treatment and seeing if it'd match what I've practically got in front of me. So I might know the outline of the theory about how they work but I need to know now in detail, will it work and will it be suitable and safe for the patient I've actually got in mind in front of me.*

*It might be that I may have read about it in a journal, I might have been to a lecture at a scientific conference, I might have received information on the internet, through avenues such as Medscape, which I could update on certain forums and things that I have signed up to, or I might have been actually told by a representative, at a stand at a meeting, that this drug's now available and he told me a little about the side effects. So I've been made*

*aware of this potential through lots of different routes and now I want to see if it will actually match what I need for my patient"* (Interview C).

The medical consultants felt that they would know something if they manage to build *confidence* that the basis of their understanding (usually information) is sound and they are able to apply their understanding (or information) in practice. Hence, building confidence was selected as the core category for the emergent theory.

Two main sources of such confidence were expressed during the interviews:

*Firstly*, the agreement and support of peers and/or experts in the field (i.e., peer influence) seem to be a major source of confidence for this group of staff (medical consultants). Such boosts to confidence can come from examiners following a successful exam result:

"*It* [passing the exam] *confirmed that everybody else thought I knew enough about it…my peers, or at that time my superiors, thought I knew enough to be independent in my practice*" (Interview E).

Confidence can be obtained from direct discussion and agreement with peers regarding a particular action. In response to being asked if he/she would use a medication straightaway that had been shown to be good in a recent publication, one interviewee responded:

*"Not unless it's something that we discussed as a group and we got some consensus as the group of physicians now because that's the way we work these days, we don't just go off and decide we'll - oh, I don't know - give that patient ginger because somewhere in the paper it looked good; you have to actually get agreement from your peers that, yes, it's a good idea and it's safe to use and it needs to be approved by everybody, so that people aren't going to think that you're behaving in a way that is out of consensus"* (Interview B).

Acknowledgement by peers of one's expertise through requesting one's help and advice is also a source of confidence:

"*It's now being reinforced* [their feeling that they know a type of leukaemia] *at work as now everyone sends their patients to me and I'm starting to get phone calls. I got a phone call from Hull yesterday saying "We've got a patient with ALL. What do you think we should do?" The more I get phone calls, the more I think highly of myself in this area. So as I get invitations to speak or to sit on advisory boards, now trial committees and things, that kind of reinforces the idea that I think about myself, being that others think I know plenty*" (Interview G).

The following quote explains how the staff highly valued interactions with their peers and experts related to documented knowledge in journals and books as a source of knowledge (or confidence):

"*I think that having a peer group there is definitely beneficial…it's a one-to-one conversation (with an expert) which is the best if you can. Otherwise even if it's a group or a talk, then you can ask questions…a meeting, if it's being presented by an expert in the field who is actually presenting good data, I would regard that as being high up on the list and probably more useful than the journals, because you get that opportunity to question and challenge the information you're being presented with*" (Interview A).

*Secondly*, hands-on-practice of such understanding or information in a real situation (direct practice) is an effective source of confidence. It seems that trying out certain skills and obtaining immediate feedback from such trials is an effective way to enforce our knowledge. One interviewee explained:

"*If you trying to learn something, or I have to learn something, I might have to keep doing it over and over again, whether that be a physical skill like playing the scales on the piano or it might be a fact in a book*" (Interview B).

Another interviewee explains how a lack of practice can adversely affect skills:

"*I suppose it's the phenomena of, first, you feel that you probably know quite a lot about it, but if you're away from it a long time, your practical knowledge will fall away because you're not keeping up to date*" (Interview F).

Exposure to a particular situation and learning by practice is usually expressed as experience, as shown in the following quotes:

"[Acquiring knowledge] *is a combination of experience and that's acquired quite slowly over time. Also reading journal articles, attending conferences, listening to talks and things like that"* (Interview F).

"*Some of the knowledge that you acquire with time and experience, so it's having seen scenarios over and over again*" (Interview G).

"*You get more confidence as you go along because of your experience, your personal experience*" [with reference to a new trial protocol] (Interview B).

A lack of exposure (e.g. lack of practice) can damage confidence even if the doctors know the theoretical bases of the problem in front of them. Such a lack of confidence (and hence lack of effective knowledge) is well explained by the quote below:

"*One example is a case that we had this weekend; a lady who the general feeling that she had developed veno-occlusive disease during the course of the weekend. Now, that's a condition where I've read the guidelines and have been to a lecture about it but, in real life, it is much more difficult to know that that was right and what to do, even though I've read all about it. For the treatment for this condition, the text book says that but, in real life, I've*

*no certainty about actually doing that because the patient wasn't a text book patient*" (Interview C).

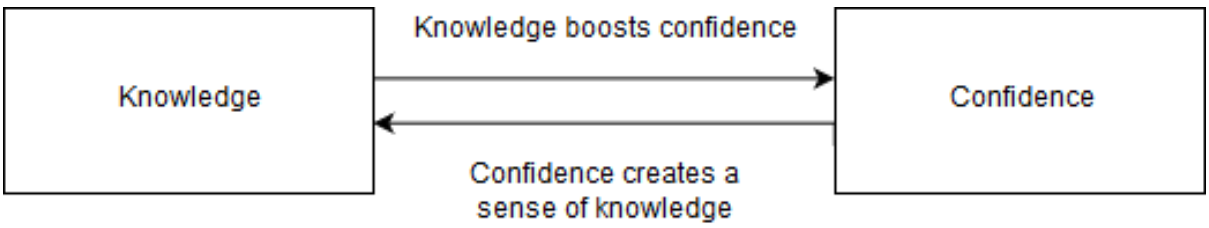
An interviewee explained how they became knowledgeable in a certain particular skill (parking a car) through repeated practice and this was clearly reflected in their confidence:

"*One weekend, I came here* [to the hospital] *and had my husband in the car, and I had been parking the car in the consultants' car park, which here is tricky – there're a lot of pillars and posts. I've learnt that there're certain bays in the car park where I feel comfortable parking in now, as I know that, if I do that manoeuvre, stop there, reverse there, I know I'm going to get it in without bashing it, and I've beepers on the car and they beep. My husband's saying 'Stop, stop here, we're going to hit something' but I'm not, I know that I'm alright in this particular situation in there*" (Interview B).

We are aware of information, practices, etc., but will not know such artefacts until we develop the required confidence. This led here to the conclusion that a significant component of our knowledge is confidence in what we know and in our ability to use it. Confidence can be established as one of the meanings assigned to knowledge and this is the contribution of this research to knowledge in the field of business administration.

**Knowledge – Confidence interactions:**

These two concepts are interrelated. The argument in this these is that confidence is very influential on knowledge to the extent that it forms an integral part of knowledge and is a critical component that is essential to the final product of knowledge. Unjustified, misplaced confidence can create a false sense of knowledge. However, it should also be acknowledged that knowledge makes us feel confident.




**Graph 5.3** The bidirectional relationship between knowledge and confidence

The effects of knowledge on boosting confidence are not discussed in this dissertation as the effects of knowledge on confidence are not the focus of the research question. The discussion in this thesis was kept, to a great degree, unidirectional for clarity and to show a new contribution to knowledge. The findings of this research have shown that our knowledge consists of two parts: firstly, objective information and skills and, secondly, the

emotional part. Three scenarios can explain the interactions between these knowledge components:

- **The desirable scenario**: adequate amounts and the correct types of information and skills as well as the appropriate dose of confidence: this leads to positive outcomes as doctors will deliver a service that is based on correct information but within the limitations of their capabilities.
- **The ineffective scenario**: adequate amounts and the correct types of information and skills but no confidence to support what one knows: this leads to no outcomes, as the person will be unable to use what they know. A lack of confidence is incapacitating.
- **The dangerous scenario**: a lack of adequate amounts and the correct types of information and skills but inappropriate confidence in what individuals think they know: doctors will confidently use incomplete or incorrect information, with very damaging outcomes

**Relating supportive categories to the core category:**

Figure 5.3, below, summarises the meaningful relationships between the core category of building confidence and each of the other categories. Detailed explanations and relevant links to the primary data are provided in the main categories discussion in section 4 below.

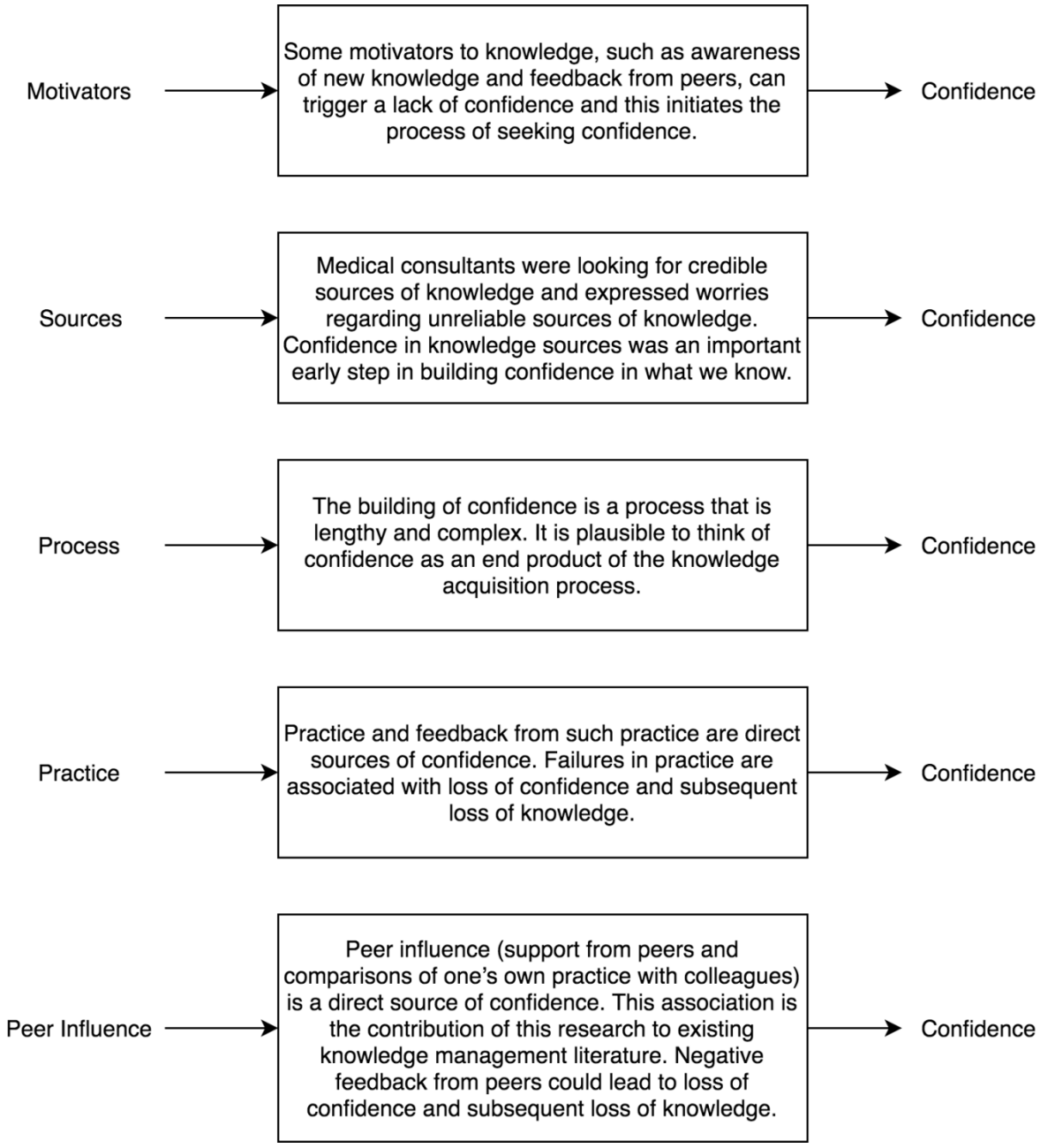



**Figure 5.4:** This support that the five final categories provide to the core category of confidence

**Presenting theory as relationships between the propositions:**

The following table shows the relationships between the main categories, which makes it possible to present the constructed theory in more detail. The theory is reported in the form of propositions. This table summarises the emergent theory. A detailed discussion of these propositions, including the chain of evidence that links them to the primary data, is provided in the presentation of each category below, as is a graphic representation of these relationships (Figure 6.0).

| | Interrelated Categories | Propositions |
|---|---|---|
| 1 | Confidence and Motivators | Knowledge workers are influenced by several negative or positive motivating factors to start a process of knowledge acquisition that leads to the gaining of confidence. |
| 2 | Confidence and Sources | Knowledge workers use various sources of knowledge during the process of knowledge acquisition. Their confidence in such sources will increase (or decrease) their final confidence in what they know. |
| 3 | Confidence and Process | Knowledge workers engage in a complicated process in order to gain confidence in what they know and what they can do with such knowledge. |
| 4 | Confidence and Practice | The act of practising to gain and maintain a practical skill is a direct, reliable source of confidence. |
| 5 | Confidence and Peer Influence | The approval of others (usually experts or peers) is an important source of confidence in any information. The lack of such approval could lead to the failure to know information or practice. |
| 6 | Peer Influence and Practice | Feedback from peers and experts about certain information and practices and the direct practice of skills by an individual are the two main sources of confidence in what we know and do. These two sources can confirm each other to substantiate confidence further. |
| 7 | Peer Influence and Process | Seeking approval from peers as well as comparing one's own ability and skills with others (the main source of confidence in this group of knowledge workers) usually requires a multi-stage, complicated continuous process that should keep our knowledge (confidence) up to date. |
| 8 | Peer Influence and Sources | Peers debate various sources of information and assign different levels of credibility to such sources. The process of seeking peer approval usually involves a critical examination of the sources of knowledge. |

| | | |
|---|---|---|
| 9 | Peer Influence and Motivators | Negative feedback from peers can be a motivator for gaining new knowledge. Support and encouragement from peers can also be motivators. Strong motivation can lead to strong engagement with peers, and vice versa. |
| 10 | Practice and Process | Practising skills is a direct source of confidence. Practice is the end result of the knowledge acquisition process. However, it could be argued that practice is the final step in knowledge acquisition. |
| 11 | Practice and Sources | The practice of skills (like most activities in life) requires sources/resources before it can begin. Certain information, advice, hints, etc., must be available to help the practice. The results of such practice depend on the quality of the sources/resources. |
| 12 | Practice and Motivators | Practice to gain confidence requires adequate levels of motivation. Strong, sustained motivating factors will lead to persistent practice which will build strong confidence (the confidence of an acrobat walking on a tightrope at a high altitude). |
| 13 | Process and Sources | The initiation of an effective knowledge acquisition process relies on the presence of reliable, continuous sources of knowledge. This could be the availability of updated information or easy access to areas of practice |
| 14 | Process and Motivators | The initiation and continuation of the knowledge acquisition process requires the presence of strong, persistent motivating factors. A smooth, satisfactory process can also act as a motivator and vice versa. |
| 15 | Sources and Motivators | Sources of knowledge (available information or areas of practice) can act as motivating factors in themselves. Moreover, the presence of strong motivations will trigger the search for better sources of knowledge. These two categories are closely related. |

**Table 5.2**: The relationships between the main categories

**The dynamic nature of the knowledge acquisition process:**

According to the emergent theory, confidence in what we know gives us knowledge. However, such knowledge is not permanent. Confidence (the basis of knowledge) is a human feeling that can fluctuate, sometimes very rapidly. This provides an opportunity to

search for more, or different, confidence elsewhere and so update our knowledge. This creates a dynamic cycle of knowledge acquisition (Figure 8.8). The whole process of dynamic confidence was summarised by one of the interviewees:

"*I think confidence is cyclical so, yes, I can't particularly give you a scenario but I think you have periods of time where you're functioning well and your decisions appear to be good and then, at some point, you either get things slightly wrong or things don't go the way you predicted, and then you swing the other way a bit; so you lose confidence in your decision-making and I think confidence about clinical decision-making is cyclical…I think each of those errors usually teaches you a lesson about something. So maybe, rather than it being a regular cycle of confidence and lack of it, maybe the periodicity lengthens, I'm not sure…your confidence builds up again and you feel happier making decisions until the next time that something slips through the net or doesn't quite function the way you thought it did*" (Interview H).

The critical steps in this cycle are when confidence is lost or reduced. As explained in Figure 5.5, there are two suggested pathways for lost confidence management:

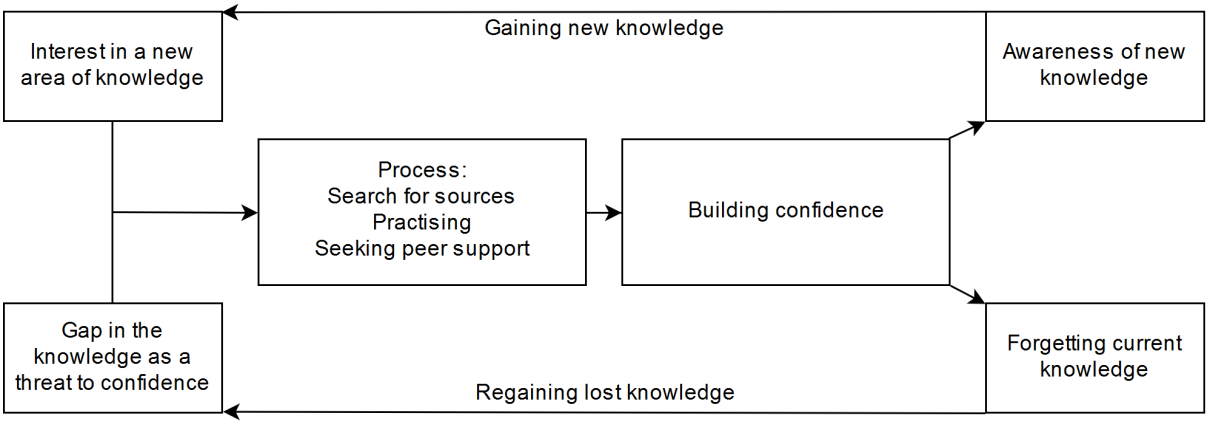



**Figure 5.5:** The dynamic knowledge cycle

*Firstly*, when knowledge is forgotten. The awareness of lost old knowledge can motivate knowledge workers to refresh and search for the old knowledge again by looking for sources, engaging in training and/or consulting with colleagues to regain their confidence (and knowledge). One interviewee commented:

"*Because I haven't done a bone marrow biopsy for many years now - someone else does it in the department - so I'm definitely less confident now about a bone marrow biopsy; or, for example I haven't put a central line in for 15 years, so there's no way that I'd even try and do it. I've the skill and I was confident, but if I haven't done it for so long,*

*I'm not going to do it now. Yes, you lose your confidence, you don't lose the knowledge so you still know knowledge that this is the point where you put the needle in, so you have the knowledge but you lack the confidence*" (Interview K).

There is a chance that the old knowledge no longer exists or is no longer acceptable or correct. There are several mechanisms for managing this within the knowledge acquisition cycle. The sources of knowledge may be different or new and peer influence may change, so that the confidence built at the end of this process may be relatively dissimilar to the lost confidence; i.e., although the knowledge workers started by trying to build the same confidence (regain their forgotten knowledge), they ended up, due to the new, up-to-date sources and changed peer input, acquiring different (hopefully more appropriate) knowledge. Also, whilst trying to refresh and regain their old lost knowledge, knowledge workers may find that such knowledge no longer exists and that a new approach to this area of practice is required. This would encourage them to develop an interest in a new area of practice and move into the top part of the cycle.

*Secondly,* knowledge workers may lose their confidence, not because of memory loss or de-skilling but because they become aware of the existence of new knowledge or practice, and so lose their confidence in what they know or do. This will activate the upper loop of the knowledge dynamic cycle. The awareness of such gaps in knowledge created by new developments will act as a strong motivator that should trigger the knowledge acquisition process ultimately to build new confidence. The following quote from an interviewee explains the struggle of medical staff to keep up-to-date:

"*Much of what I learnt as a registrar's no longer applicable, and much of what we teach our current registrars now may not be applicable in five years' time, when they're consultants*" (Interview L).

"*It's an ever-changing field, so what you get validated in is always stuff that's slightly out of date. I mean, you know in this field that things change, that the prospect of gene therapy comes and goes, the concentrates we use are changing all the time, so five years ago, you may have been an expert on what the standard of care was give years ago, but now it's changed, if you see what I mean. So you're only an expert in as much as your confidence, so it may be true that, academically, I'm less familiar with gene therapy or some of the new extended half-life treatments in this area than I was before they existed. So I don't know everything about them but I'm more confident the more experience I get in how to manage patients, which is slightly different from academic knowledge*" (Interview L).

This process explains the dynamic nature of knowledge acquisition and explains how knowledge is kept up-to-date. Knowledge management models should aim to ensure that

functional, well-oiled dynamic knowledge cycles exist in the organisations. An interviewee commented:

"*What gives you confidence is making decisions about treatment and then them turning out correctly, or them not turning out correctly but you learning something from them, and perhaps you learn more from the ones that didn't go quite so well, and that's why I think, in medicine, a personal anecdote carries more weight than it should do*" (Interview D).

The loss of knowledge, whether deliberate or accidental, was more prominent during the interviews with senior staff more than with the recently-appointed consultants. Ignorance and the concepts of forgetting and remembering as well as the evidence relating to them from the interviews will be explained during the discussion of category 1 on motivation in section 4 below. An awareness of a lack of knowledge is critical for our ability to manage the unexpected, and this will keep the knowledge cycle moving.

**Limitations of the knowledge process:**

Defining knowledge as confidence can be used practically by organisations, including the NHS, to manage knowledge purposefully and limit the confusion which currently exists due to the presence of many concepts of knowledge and variable models of knowledge management (see the literature review in Chapter 2). For example, positive, constructive interaction with peers and experts should be considered a critical step in knowledge (or confidence) acquisition and this interaction should be encouraged, facilitated, monitored, supported and evaluated in terms of its effectiveness (see Chapter 7). However, the understanding of knowledge as confidence exposes two significant limitations of the knowledge acquisition process. The findings of this research define these limitations well and this allows the management to design tools (see Chapter 7) for overcoming such limitations. These limitations include issues with dated, circular knowledge and knowledge as an imperfect product.

A limitation of the knowledge acquisition process is the potential for circular knowledge.[20] Knowledge workers gain confidence (knowledge) from their peers and this can become a closed circle, where old knowledge is continuously recycled due to a lack of new knowledge or even resistance to new knowledge. The limitations of peers was explained by one of the interviewees as follows:

"*Most colleagues, when they tell you about things, it's really on the basis of things that they've experienced themselves once or twice…unless they're an expert in that field, the*

[20] The term 'circular knowledge' is used here to describe the continuous exchange of old information between staff without any updating or development; see Chapter 6 for further discussion.

*average colleague doesn't know more about it than I do…So, if a colleague came and said, "I used this on this patient and it's really good", I wouldn't use that as my basis for treatment. I'd want to know more about it from a peer review type of situation"* (Interview C).

The findings of the previous section on the dynamic nature of knowledge explains how knowledge can circulate but is not regenerated if the external input is cut off (see Chapter 6 for examples of this drawn from NHS practice).

The other limitation of the knowledge acquisition process is that confidence can be misplaced and lead to incorrect knowledge. The acquisition of knowledge is not a perfect process and can lead to the acquisition of wrong or incorrect knowledge, for example, through the utilisation of incorrect sources or due to ineffective peer feedback. This could lead to confidence that is misplaced. A lack of sufficiently challenging peers could encourage overconfidence in one's ability and ultimately lead to unjustified, misplaced confidence, which constitutes incorrect knowledge.[21] According to this, knowledge is not always right or true; i.e., it is not necessarily truth. It is a relative personal feeling which continuously fluctuates within individuals. Staff work to gain more confidence and so be knowledgeable; however, this could be in the wrong direction.

Medical staff usually strive to be knowledgeable (or confident):

"*It's professional pride of wanting to be seen as knowledgeable and expert*" (Interview F).

The problem of baseless confidence (or negative types of knowledge) is noted in the following quotes:

"*I think there are some people who are supremely confident but they don't really have the knowledge base to back it up*" (Interview C).

"*It was pitiful, it was worrying, it was very funny and it was slightly terrifying that there are a lot of people out there who seem to react to a very primal belief in their abilities without the knowledge behind it"* (Interview D).

Some problematic publications can be misleading and a source of unjustified confidence:

"*Some of these (journal) articles are very very nice, but they're not based on the most robust of evidence and if you actually scrutinized the lovely graphs very carefully, some of the numbers involved and P values that they're quoting, you just think, 'Actually, do you really have the statistical power to say that?', and sometimes the original classic sort of*

[21] See Chapter 6 on the negative implications of excessively weak/strong peers for the process of confidence building.

*example would have been the myeloma elderly sort of MPT group, where they showed an initial publication with good separation and survival and then, when they re-published on the same group of patients two years later, the survival codes had sort of joined up again, so you do have to be wary of that sort of stuff. Give data enough time to mature*" (Interview A).

"*I also know how some of the journals do peer review and I've seen some information that should never have been published, even in good, reputable journals, so I'll always assess it according to my knowledge and then try to do it, if it makes sense*" (Interview A).

According to the emergent theory, the process of building confidence and acquiring knowledge does not guarantee justified, well-placed confidence or correct knowledge. It is a process that depends on its components, including sources, peer influence, etc., and the end product of the process (knowledge as confidence) is highly dependent on the quality of these components. Knowledge acquisition is not a perfect process and the end product of knowledge can be incorrect. The following is a discussion on the ways that could lead to wrong knowledge and misplaced confidence. This discussion is a summary of the views and conclusions regarding the main categories, as explained below as well as in the earlier discussion in this chapter on the core category.

*Firstly*, a lack of motivating factors may slow down or stop the knowledge acquisition cycle, resulting in retaining confidence in outdated information. In time, this could become wrong or, in healthcare particularly, dangerous knowledge. Biased motivation towards a particular type of practice or certain sources of information can lead knowledge workers to seek one type of knowledge at the expense of other, more relevant and more important types of knowledge. The ultimate knowledge, although correct, is incomplete and probably misleading because it does not include all of the available options. The presence of multiple or different motivating factors within different members of the team may contribute positively or negatively to the knowledge acquisition process. The presence of different competing motivating factors will allow different members of staff to pursue different types of knowledge and ensure coverage of a wider area of new developments. However, the conflict that may arise may influence the peer influence required to build confidence, knock confidence in legitimate, useful knowledge and skew the overall knowledge in a direction dictated by the conflict and power within the team.

*Secondly*, issues with the sources of knowledge have always been seen as a major contributor to the difficulties associated with acquiring knowledge, probably because these are the most visible part of the process. Three types of problem can be identified: unreliable sources such as some questionable publications and some misleading expert advice can

contaminate the sources of knowledge; outdated or immature data can also lead to a loss of confidence in the resources used to build knowledge; and, finally, conflicting data, information or reports can confuse the process and knock our confidence in our knowledge.

*Thirdly*, the process of knowledge acquisition is a long, complex one. It is influenced by emotions and conflict. Unlike other steps required to build confidence, the knowledge process is the least visible to staff and can be the most difficult to manage. The issue with circulating the same old knowledge is that this involves a closed process, which can be damaging.

*Fourthly*, practical exposure to develop confidence in healthcare-related skilful activities was expressed during the interviews as an important factor within knowledge acquisition. However, the availability of opportunities to practise (e.g. operating on children's hearts) can be limited and requires careful organisation, which has funding and cost implications.

*Fifthly*, peer influence, according to the emergent theory, is a major contributor to building confidence (i.e. acquiring knowledge). The presence of effective, balanced peer input is critical. Issues around excessively weak/ strong peers and the destructive implications of this on the process of knowledge acquisition are explained in Chapter 7.

*Finally*, confidence (as knowledge) can be difficult to manage. It is a human emotion that can be highly sensitive to the environment and fluctuate quickly with practice (or a lack of it) and peer influence. It is also linked to personal character, and so certain people are usually more confident than others in the same circumstances.

Evidence drawn from the interviews to support these limitations is presented in the next section.

### 5.4. The Five Supporting Categories

The following is a description of each of these categories. Each section starts with a definition of a category, then defines its dimensions and links it with the other categories and the core category. Evidence to support the findings is provided as quotes from the interviews rather than codes, which makes it possible to link the conclusions directly to the primary data and allow the readers to see for themselves what the interviewees said and what conclusions were drawn, in order to ensure that the constructed theory is grounded

in the primary interview data. However, each quote can be tracked down by a code or a group of codes (on the coding, see Chapter 4, the methodology chapter).

### Category 1: Responding to motivators

It was evident from the interviews that there are factors that, when present, can motivate (or demotivate) medical consultants with regard to initiating and maintaining the process of knowledge acquisition. Different factors operate during different stages of their careers or in different work situations. This section examines examples of motivating factors that were mentioned by the research participants and explains how these are connected with the other main categories, particularly the core category of building confidence.

**Example motivating factors:** Relevance to practice, awareness of legal obligations and personal interest in a particular specialisation were frequently mentioned by the interviewees. Relevance to the knowledge process is an important reason to seek knowledge. This is mainly relevant to the patient care process:

"*It's always the **relevant** things, there's no absolute here*" (Interview A).

"*If **something very significant** has happened, such as an **unexpected death** in a patient*" (Interview D).

"*So I've been made aware of this potential through lots of different routes and **now I want to see if it'll actually match** what I need for my patient*" (Interview B).

The relevance can also be to the medical training process, as in passing exams. Studying for an examination is a motivating factor:

"*There are probably a couple of peaks [*in acquiring knowledge*] when I was absolutely focusing very hard on the exams and studying*" (Interview A).

"*I think they [*the exams*] forced me to look into the areas of haematology that I'm very glad that I don't have to deal with now, like clotting*" (Interview E).

"*I think the process of revising for FRCPath is useful…The process of revising and studying was very useful*" (Interview G).

Relevance to the medicolegal constraints on practice can also be a reason for maintaining knowledge. Some of the open codes from the interviews exposed the doctors' concerns regarding the legal implications of their decisions and the process used to reach such decisions:

*"I am also reminded [*to*] actually really do, have to be seen to be seeking advice in the very medical legal environment that we seem to be in at the moment…You can be severely* ***criticised*** *for it"* (Interview E).

Here, doctors are seeking advice (and showing that they are doing so) in order to mitigate legal risks and/or avoid criticism.

Aiming for specialisation and the need for the division of labour are motivating factors: some medics choose to develop an **interest** in a particular field and this motivates them to pursue knowledge accordingly. In the following quotes, interest means specialisation, which is a type of practice:

"*I had an* ***interest*** *and then I studied for my MRCPath exams*" (Interview A).

"*If you're* ***interested,*** *there's always something more you can learn*" (Interview C).

"*So the things I know well I'd point to being my areas of* ***interest,*** *so acute lymphoblastic leukaemia*" (Interview G).

Many of the codes from the interviews acknowledged the different types of knowledge, for which there can be different types of knowers. There was an emphasis on and acceptance of specialisation. This was partly to manage the problem of information overload but also as a means of division of labour:

"*I probably know where my parents are…How to get hold of them…I probably know the myeloid malignancies very well*" [describing the types of knowledge he/she has] (Interview D).

"*If you ask people who are very clinically biased, they won't know a lot of the biological stuff…I find this almost a dichotomy of individuals working within the same field with the same group of patients and disorders, but their knowledge base is so, so different and there's a lot to try and keep up with…There're groups of people who know a lot about this but not about the other and the other*" (Interview D).

The interviewees managed the discrepancy between their limited capacity and the wide scope of the field of medicine through specialising, which led to improved motivation:

"*I think having a generic knowledge of a subject and disease is very different from knowing the processes of how to deal with the disorder in the environment you're in*" (Interview F).

It also helps them to cope with areas where they lack knowledge:

"*No, because it is also biological research and I'm very clinically biased*" [when asked whether he/she considers him/herself an expert in this field] (Interview D).

Specialisation works as a driver to acquire more knowledge, helps medics to focus on certain sources of knowledge, guides their knowledge process and defines how they interact with the peers to gain sufficient confidence in themselves and their knowledge.

**Confidence, or the lack of it, as a motivator:**

The data from the interviews showed that this category (responding to motivators) is closely linked to the core category of building confidence. Providing praise and encouragement to staff and recognising clinical excellence enhances confidence and so improves motivation:

"*It's now being reinforced at work by now, everyone sends their patients to me and I'm starting to get phone calls. I got a phone call from Hull yesterday saying, 'We've got a patient for ALL. What do you think we should do?' The further I get phone calls from the more I think highly of myself in this area. So as I get invites to speak or to sit on advisory boards, now trial committees and things, that kind of reinforces the idea that I think about myself that others think I know plenty*" (Interview G).

The awareness of a gap in knowledge or feeling that knowledge has been forgotten post major threats to confidence but are also strong motivating factors. References to forgetting, remembering and the need to refresh knowledge occur frequently in the interview data:

"*And then I still felt that there were some **unexplored areas**, which I wanted to get the answers to, so it just kept me running*" (Interview A).

"*When I got back [*from maternity leave and could not remember things*], I found I had to look up or ask someone because I can't quite remember*" (Interview C).

A loss of knowledge, whether deliberate or accidental, was more prominent during the interviews with senior staff more than during those with recently-appointed consultants. Although one may be tempted to conclude that the senior staff are more likely to forget information and need it refreshing, there is another, probably more convincing explanation: the expanded knowledge of senior staff may have given them a greater awareness of their ignorance and knowledge loss. The speed of change in knowledge acquisition may have increased the awareness of the senior consultants regarding the amount of knowledge, information and data that is out there, and this has created a sense of ignorance, which could be constructive. There follow some quotes from the interviews related to the forgetting and refreshing of information:

"*I know what I was taught at school but some of this I've* ***forgotten***" (Interview B).

"*Yes, for instance, managing a haemophiliac, I haven't had to do that for real for twenty years. I wouldn't know exactly what to do*" (Interview B).

"*I don't know if I've learnt more or if I've* ***refreshed****. I think I've* ***refreshed more****; I think quite a lot of what I think now I know that I didn't know six months ago I did know years ago*" (Interview C).

"*Yes, I suppose so and it also makes it easier for me because I didn't have to learn it, just kind of* ***refresh***" (Interview C).

An awareness of a lack of knowledge is a motivating factor to seek knowledge and so the management of knowledge and the management of ignorance are equally important and must progress side by side. Information overload makes our awareness of ignorance more acute. One interviewee commented:

"*I don't know all the snippets of the literature out there*" (Interview C).

"*Even though my experiences and knowledge are probably well and truly above a lot of other people because I am specialised in this area, I am always very hesitant I am an expert*" (Interview D).

The feeling of ignorance, and its effects on confidence, is a strong motivating factor. There are many types of absence of knowledge or ignorance about existing knowledge that can trigger the motivation to seek further knowledge:

The unknown unknowns:

*"It was very funny and it was slightly terrifying that there are a lot of people out there who seem to react on a very primal belief in their abilities without the knowledge behind it*" (Interview E).

The known unknowns:

"*I've actually discovered that a lot of us are very much so-called experts in the field and there are still always gaps in my knowledge, and there are some bits that some people know and some bits that other people know*" (Interview E).

The knowable known unknowns:

"*I can be an expert in, say, the use of a drug, but there'll be other people in Europe who have the ability to use this drug outside the very strict licensing rules that we have to adhere to here, so that they have more experience of this drug, even the off label uses*" (Interview D).

The unknown knowns:

"*… professors or experts in their field who couldn't explain the things as well as I did*" [explaining that she could do things better than others and was surprised that she knew more than she believed] (Interview D).

Two actions for managing ignorance can be extracted from the interviews:

Firstly, acceptance of ignorance. Healthcare professionals have to accept that there are questions related to patients' diagnoses and treatment that have, so far, not been answered. Healthcare professionals use acceptance as a survival technique in a profession that is heavily dependent on knowledge and its correct application:

"*A lot of the time, if there are difficulties, actually the difficulty is because there is no right answer rather than there is a right answer and I don't know it*" (Interview G).

Secondly, a more constructive manoeuvre is the concept of collective knowledge, i.e. we together know more and could cover each other's ignorance. Staff are motivated to work together to reduce the gaps in their knowledge and boost their confidence.

The awareness of ignorance is a major challenge to confidence and the discussion of ignorance strengthened the conclusions of this project. The interviews provided confirmation that healthcare professionals struggle with many types of ignorance. The awareness of ignorance is particularly acute in the minds of healthcare professionals and, given the nature of their work as knowledge workers, this is unsurprising. The awareness of ignorance is a potent motivator for seeking further knowledge. However, as shown by the theory discussed in section 3 of this chapter, there is a (vital) difference between ignorance and the awareness of ignorance; while the former is dangerous, the latter is constructive.

In addition to its links to the core category, this category on motivation can be linked to all of the other main categories used to build the theory. The following findings explain this:

**Motivation factors related to the sources of knowledge:**

**Exposure** to certain practices or problems, such as a recent clinical experience during daily practice, can work as a motivator:

"*Yes, there're some things that I don't **practise** professionally*" (Interview A).

"*Before coming into this field, I knew little about it and then, getting more **exposure** and experience, I felt that I had an interest in it*" (Interview A).

"*I'm beginning to come across examples of patients where what I've heard about that drug might fit their particular needs*" (Interview B).

A lack of exposure to certain practices was viewed by the participants as a demotivating factor:

"*Yes, for instance, managing a haemophiliac, I haven't had to do that for real, for twenty years. I wouldn't know exactly what to do*" (Interview B).

The **availability** of knowledge to acquire can increase the willingness to learn:

"*I probably acquire more knowledge now, even every week, than I actually did because (a) there is more knowledge to acquire, more is known so I'm increasingly aware that there are things that I don't know, or I need to know more about*" (Interview B).

"*Now, you're constantly being almost bombarded with opportunities to learn things*" (Interview F).

Many illnesses remain difficult to treat. The feeling that a cure (or significant improvement) cannot be achieved based on the current knowledge (i.e., a lack of sources of knowledge) can be de-motivating. One interviewee commented:

"*A lot of the time, if there are difficulties, actually the difficulty is because there is no right answer rather than there is a right answer and I don't know it. Most of the time, when we face a difficult situation, it's actually because there isn't a right answer, and if you went to a dozen people, you'd get a dozen different answers. So, in that situation, often, I might, if I don't know what to do, phone around or discuss with my colleagues. Actually, usually, as a result of that, I get half a dozen different opinions and the reason is that there isn't a right answer*" (Interview G).

"*I believe very strongly in doing the best but I know that that's the best I can do at the time, given the situation and the resources. We don't have infinite time, infinite energy, infinite money, infinite resources, and actually everything we do is limited by some of those things. Pragmatically, we do the best that we can*" (Interview G).

**Interaction with peers** can be motivating:

"*It's more of peer support**,** it's an energy where **people enthuse each other** about the work we're currently doing and seeing the prospects for a better, brighter, better way of doing things in the future, and I quite like that because it's also consolidating the theoretical knowledge for the real world and sort of moving things forward*" (Interview E).

This could explain how people can motivate each other. One interviewee stated:

"*I can be an expert in, say, the use of [*a drug*] but there will be other people in Europe who have the ability to use [*this drug*] outside the very strict licensing rules that we have to adhere to here so they have more experience of [*this drug*], even the off label uses*" (Interview D).

Also, however, people within less motivated teams can demotivate each other, which might result in highly-performing teams in certain organisations and less motivated teams in others. One interviewee said:

"*When I was working in London and (that was when I was an SpR) that Centre was the centre for CMV, it was the Reference Centre for CMV Worldwide in a way. So there was a lot of research going on, a lot of activity as compared to Sheffield. When I came here, CMV was just a service and not many people knew much about it, and it was actually quite surprising to me because I thought that virology had a heavy role in virology. So, from that point of view, I did feel that, yes, probably, I know more about CMV and/or have actually experienced more about CMV than other people, so it's all a matter of where you are and the amount of experience*" (Interview A).

Recognition of one's clinical excellence by peers can improve motivation:

"*I get invites to speak or to sit on advisory boards, now trial committees and things, that kind of reinforces the idea that I think about myself that others think I know plenty*" (Interview G).

"*It's professional pride of wanting to be seen as knowledgeable and expert*" (Interview F).

**Practice as a motivator:**

A change of practice or the need to change practice (because the current treatment options are not working) are reasons to learn more:

"*If, for some reason, I decided to move to Yemen and start practising haematology there, I'd have to change my practice*" (Interview E).

A lack of exposure to certain practices was viewed by the participants as a demotivating factor:

"*I haven't had to do that for real, for 20 years. I wouldn't know exactly what to do*" (Interview B).

Practice (and the lack of it) has been shown to be a motivator to pursue knowledge.

In conclusion, a certain degree of motivation is required and the research participants described many motivating factors that are essential in order to initiate and maintain the process of knowledge acquisition. Examples from the interviews showed that these factors are diverse and variable. Motivation is part of the knowledge process, and can be related to the other main categories of this research, particularly confidence building, so its inclusion as a main category in the emergent theory is justified.

### Category 2: Finding knowledge sources

Medical staff interact with various sources of knowledge in the early stages of building and maintenance of their confidence. These sources include textbooks, journal articles, conferences and the Internet. Also, the medics indicated that certain practices act as sources and contributors to knowledge building. Examples include: an appropriate workload; preparation for examinations; and pre-existing expertise which may act as a self-renewing entity; i.e. an expert can learn more quickly because of his/her pre-existing experience (the learning curve principle). Some of these resources are found to be more helpful than others.

The available sources of knowledge can be outdated, unreliable, immature, changing or diluted and this can be demotivating and damaging to confidence. This point, on problematic sources, links the motivation and sources' categories together as well as linking both to the core category of confidence and showing their interdependency. One participant expressed scepticism regarding some of the published medical knowledge:

"*I also know how some of the journals do peer reviews and I've seen some information that should never have been published, even in good, reputable journals. So I will always assess it according to my knowledge and then try to do it, and if it makes sense*"
(Interview A).

Direct interaction with an expert, e.g. at a conference, was highly regarded as the best and most effective source of knowledge, whilst textbooks were deemed less reliable because they are usually outdated by the time they are published. The following quote summarises the various sources of knowledge used by the medical staff:

"*It might be that I may have read about it in a journal, I might have been to a lecture at a scientific conference, I might have received information on the internet, through such as Medscape, which I could update to certain forums and things that I have signed up to, or I might have been actually told by a representative, at a stand at a meeting, that this drug is*

*now available and told me a little about the side effects. So I have been made aware of this potential through lots of different routes, and now I want to see if it will actually match what I need for my patient*" (Interview B).

The interaction with the sources of knowledge can also be quite dynamic:

"*I think there are different times when different methods* [of gaining knowledge] *work best; so, when you're at a conference and away from work, you are having an intense lot of lectures and peer-to-peer discussions and networking and that sort of thing is beneficial, for that 2 or 3-day period when you are at that conference, but at the end of that I'm done, I need to absorb that information and consolidate it and be outside a conference environment for a little bit and go back to applying the new knowledge to patient care, and then perhaps read around what's been discussed semi-formally or informally at those meetings with further online reading*" (Interview E).

**Classical sources of knowledge:**

**Experts and conferences** were valued as the best sources of reliable knowledge:

"*Oh, discussion with an expert, there's no doubt about that.* [When asked which is better for acquiring knowledge, reading an article or speaking to an expert]…*it's a one-to-one conversation* [with an expert] *which is the best if you can. Otherwise, even if it is a group or a talk, then you can ask questions…a meeting, if it's being presented by an expert in the field who is actually presenting good A3 data, I'd regard that as being high up on the list*" (interview A).

**The Internet** is considered a common and easy source of knowledge:

"*We're all doing it. If I don't know something, I Google it. I mean, isn't Google a fantastic thing?*" (Interview C).

"*You've got Pub Med [*a website*] literature searches and that sort of thing and sometimes you do find the answer*" (Interview D).

"*Dr Google. It would be an online literature search*" (Interview E).

**Medical journals** are old-fashioned but still commonly used:

"*The good references obviously are apart from the journals, which publish all the latest studies and. in times like these, people are very quick about publishing topics of global interest*" (interview A).

"*Again, the Lancet has got quite a lot …*" (Interview A).

"*You are well covered* [legally] *if it is an article*" (Interview A).

**Professional bodies**, such as medical societies and Royal colleges, are a reliable source of knowledge:

"*For example, you may have your own, we have a virology body where they might publish, there's the Royal College which may publish it, there may be an overlap with another body*" (Interview A).

Guidelines are increasingly used as accessible and reliable sources of knowledge:

"*I suppose I'm so used to the idea that you've to find a guideline*" (Interview B).

**Practical sources of knowledge** include exposure to skill-building activities such as an appropriate workload, exam preparation or even being an expert. Appropriate exposure to an appropriate workload was seen as an important source for building skills and knowledge:

"*This is what the work was, there was some vague virus in Western Africa which we had seen maybe one case in 10 years, it's not going to be that much of an experience*" (Interview A).

Exam preparation can also expedite knowledge:

"*The exams obviously did improve my knowledge and understanding of things*" (Interview A).

"*It's a combination of experience and that's acquired quite slowly over time*" (Interview G).

**Limitations of the sources of knowledge and their effects on building confidence:**
The sources of knowledge have limitations and this creates difficulties in the knowledge acquisition process. These problems include: being outdated (e.g. textbooks); unavailability (new, still unpublished research or old but still useful information); issues with overload (important information is being buried among unimportant information); the doubtful reliability of the information, even in up-to-date articles published by highly respected journals, remains a concern; and a great deal of effort is sometimes required to assess the quality of published work. Some published data and information, particularly on the internet, is immature and requires further analysis or processing in order to become knowledge which can be acted on. Finally, the types of knowledge sources and the interaction of the staff with such sources have been subject to a continuous change recently, particularly due to the recent introduction of the Internet (rather than the library) as the main source of information.

**Issues with outdated sources of knowledge:**

"*There is a corona virus…because this's such a new virus, it's not in the books*" (Interview A).

[When asked which sources are reliable] "*Probably not the books because books are about ten years out of date before you get there*" (Interview A).

The sources can be unreliable:

"*Some of these articles* [journal articles] *are very, very nice, but they are not based on the most robust of evidence, and if you actually scrutinized the lovely graphs very carefully - some of the numbers involved and P values that they're quoting - you just think 'Actually, do you really have the statistical power to say that?*'" (Interview E).

"*I have seen some information that should never have been published* " (Interview A).

"*What you get from Google is information…within the information there is misinformation*" (Interview A).

The sources can be unavailable:

Explaining the fate of information regarding a virus which was discovered many years ago:*" it' all been archived and we may not have access to it. There are aspects of knowledge that are no longer available, not even in textbooks. The details you're after aren't there"* (Interview A).

*"Most of the time when we face a difficult situation it's actually because there isn't a right answer, and if you went to a dozen people you would get a dozen different answers*" (Interview G).

Raw data and immature information can delay the knowledge process:

*"Give data enough time to mature"* (Interview E).

"*So I've been made aware of this potential through lots of different routes and now I want to see if it'll actually match what I need for my patient*" (Interview B).

[When asked if he/she would use a medication that is shown to be good in a recent publication straightaway] "*No, because there are lots of things, not just about the efficacy. There are lots of things you need to know about that drug which determines whether it's available to you. Is it licensed? Is it funded?* " (Interview C).

**Knowledge overload and its effects on the knowledge process:**

The interviewees in this research project regularly expressed problems and concerns related to the amount of information available to them. This creates a challenge, that is sometimes unmanageable, and leaves them feeling vulnerable:

"*I don't get a chance to read every single article* " (interview A).

"*There's a lot more information out there that's more readily available. I'd say almost to the point of information overload, so you have to be more selective*" (Interview F).

"*I probably ought to feel that I should know plenty about myeloid but I also know that there's a lot out there that I don't*" (Interview F).

"*There's a lot to try and keep up with*" (Interview D).

"*There are groups of people who know a lot about this but not about the other and the other. It is such a big field*" (Interview G).

"*I don't know all the snippets of literature out there…There's such a big body of information out there*" (Interview C).

Information overload is an important dimension of this category. It is a major limitation and likely to knock the practitioners' confidence in what they know and give them a feeling that their information is outdated or incomplete. This would adversely affect their confidence. The issues with overload were linked to confidence in this project because the human nature of feeling around this. Overload affects humans' feelings and knocks their confidence.

In conclusion, the sources of knowledge are variable and the staff interactions with them are dynamic. The sources of knowledge are of variable quality and this sometimes triggers staff apprehension regarding misleading, immature or unavailable information. The interviewees expressed views and concerns regarding information overload. This category is related to the core category of this theory, since good sources of knowledge help to build staff confidence and vice versa.

### Category 3: Following a knowledge acquisition process

This section explains the 'process of knowledge acquisition' as one of the main categories used for theory construction in this research. The research participants described a process of knowledge acquisition that includes the motivation-to-know, which leads to searching for sources of information. Information is assessed against the views of peers. Information and skills are applied to obtain feedback. Confidence is built (or lost) based on information or skills. Forgetting information, de-skilling or a loss of confidence trigger the motivation to restart the process. The following quote explains parts of this process. Verbs, indicating a dynamic process, have been highlighted:

*"I probably **acquire** more knowledge now even every week, … I am increasingly **aware** that there are things that I **don't know**, or I **need to know** more about. … I am beginning to **come across** examples of patients where what I **have heard** about that drug might fit their particular needs, so what I **need to start looking at** now is looking at the patient I have in front of me and **going and looking** at the information about that particular mode of treatment and **seeing** if it would match what I have practically got in front of me. So I might know the outline of the theory about how they work but I **need to know** now in detail, will it work and will it be suitable and safe for the patient I have actually got in mind in front of me."* (Interview C).

This process can be seen to encapsulate all of the other categories as explained below and was found to be helpful to the participants when pursuing knowledge. One interviewee said:

*"I think the process of revising for FRCPath [*a medical degree*] is useful. Again, my idea of a structure; I had a structure during the exams; I sort of filled in a lot of the gaps…The process of revising and studying was very useful"* (Interview A).

It is noticeable that the knowledge acquisition process consists of several components, which encompass all of the other categories of the emergent theory, including the core category of building confidence. Several verbs were used to describe the various components of the knowledge process. This indicates a dynamic process and most verbs can be linked to different steps in the process. The following are some of the verbs used by the participants to describe the process, which were linked to a particular category as follows:

**Motivation**: 'have an interest', 'wanted to get the answers', 'kept me running', 'want to see if', 'you need to know', 'you need to look'

**Sources**: 'studied', 'dig deeper', 'find', 'you look in the books you find a sentence', 'pick up the knowledge', 'look at the basis', 'may have read', 'might have been to a lecture', 'received information', 'have been actually told by a representative', 'have been made aware of', 'let's find', 'go and look'

**Peer influence**: 'talk to others', 'learn from others', 'compare myself with my peers', 'talking to other people'

**Practice**: 'you have to try', 'I will always assess it', 'then try to do it', 'I do on a regular basis', 'rely more on experience'

**Confidence**: 'felt I know', 'I learn', 'have filled in the gaps'

In this sense, motivation and the sources of knowledge can be considered the knowledge process, initiating categories, peer influence, practising maintaining such a process and building confidence are the aim of the processs. Figure 5.6 explains these relationships:

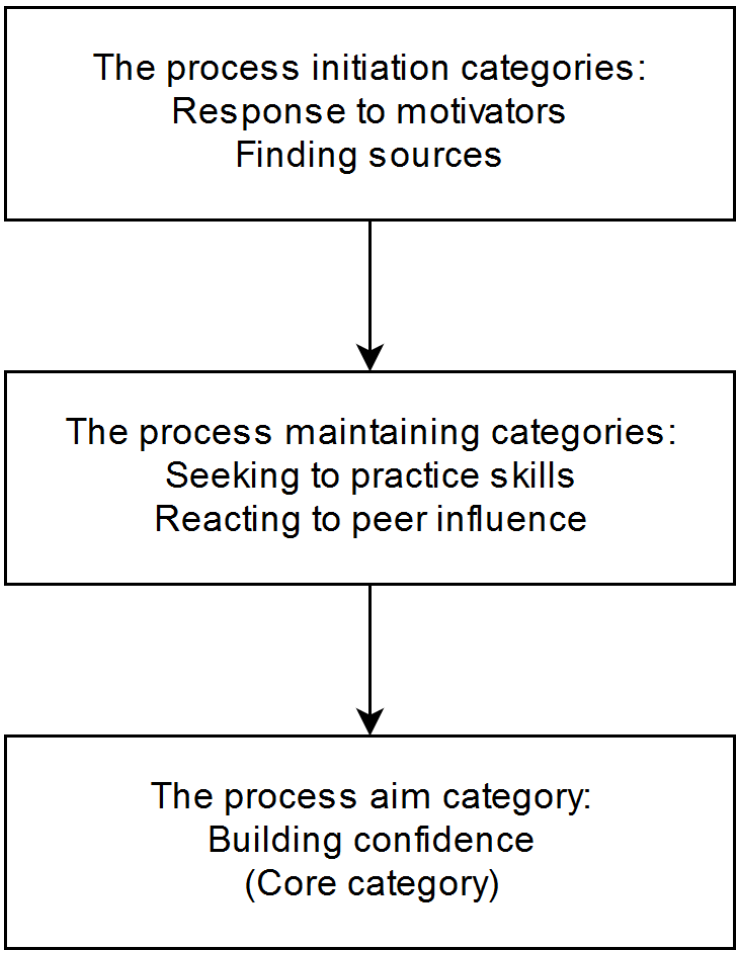



**Figure 5.2:** How the 'process' can be understood as an all-encompassing category

The following is a description of the dimensions and properties of the process category as revealed by the coding. Four properties of this category have been constructed. These include: being continuous; having time-boundaries; the demonstration of speedy changes; and, finally, a strong emotional component.

**Firstly, the knowledge acquisition process is a continuous process:**

The staff expressed the need for actions to happen every day or every week:

*"I haven't got there yet. I'm still learning every day"* [when asked about when she started to become knowledgeable] (Interview E).

"*I probably acquire more knowledge now even every week, than I actually did because (a) there is more knowledge to acquire*" (Interview C).

*"So that's* ***something that I do on a regular basis and it's almost now a process*** *where I go through at least sort of weekly*" [describing reading medical journals] (Interview D).

The use of "always" by the staff reflected the continuous nature of the knowledge process:

"*So I'll* ***always*** *assess it (*a new journal article*) according to my knowledge*" (Interview A).

"*I* ***always*** *need to consider the options*" (Interview A).

Others used phrases like 'kept me running', 'gradual build-up', 'persistence', and 'increasingly aware'.

**Secondly, the knowledge acquisition process has time scales, temporal boundaries and landmarks.** The staff can identify a point in time when certain knowledge has been achieved:

"*I think it was during my training years when, before coming into this field, I knew little about it and then getting more exposure and experience*" (Interview A).

"*I've been in haematology for 14 years, so 14 years ago I didn't know anything about it (*leukaemia*)…Probably two or three years into my consultant job, so about five years ago*" (he/she started to feel knowledgeable about leukaemia) (Interview G).

The staff can also identify the beginning of a new stage of knowledge acquisition:

"*I'm* ***beginning*** *to come across examples of patients where I've heard about a drug that might fit their particular needs*" (Interview B).

Several references were made in relation to time. These included:

"*I probably acquire more knowledge* ***now*****"** (Interview C).

"*I know now that there are some new agents on the horizon, that've only been discovered in* ***the last three or four years*****"** (Interview C).

"*Some of the knowledge that you acquire with* ***time*****"** (Interview F).

"*I need to go and stop because I've not been doing that* ***for years*****"** (Interview C).

"*I know a lot about it because I've read a lot about it because it's* ***very acute*** *in my mind*" (Interview B).

"*... but, if you're away from it for a* ***long time*** *your practical knowledge will fall away*" (Interview C).

**"*At one time***, *I used to be a library user*" (Interview B).

"*I do think that it's a wonderful thing that you can actually acquire the knowledge you need so quickly* ***now*****"** (Interview C).

"*I'm* ***suddenly*** *finding I'm at the other end and I'm thinking that I didn't really know any more about it when I arrived here than I did* ***last week*****"** (Interview D).

**"*Years ago***, *we didn't have that luxury*" [an iPad] (Interview C).

References to the passage of time were mainly made by the senior interviewees, which may reflect the intense feeling of change that is felt by this group of consultants.[22]

**Thirdly, knowledge acquisition is subject to (at times speedy) change**: a noticeable observation was that multiple references were made to the changes in knowledge acquisition and the speed of these over time. Time brought about changes in the thinking about knowledge and ways of practising knowledge; these changes have significantly altered the speed of the process of knowledge. Several references were made to changes. These included:

"*These things* ***don't remain fixed****, the optimum treatment for a condition* ***doesn't always remain the same*****"** (Interview B).

"*But it* ***was*** *a slower way of doing it…We're all doing it, if I don't know something I Google it*" (Google as a new source of knowledge) (Interview D).

"*I'm doing it all the time in the clinic* ***now*****"** (obtaining knowledge from the internet) (Interview C).

"*I do research beforehand (*searching the net before buying items*) which is something you'd* ***never have done*** *ten or 20 years ago..****I've almost stopped*****"** (reading at bed time) (Interview C).

"*I've* ***seen*** *colleagues who will look up stuff on there" (the internet during ward rounds, a change in practice)* (Interview B).

Several references were made to the faster speed at which staff are expected to learn as well as the current quick methods for providing information. These includes:

"*I know a lot about it because I've read a lot about it because it's* ***very acute*** *in my mind*" [the clinical management of a rare condition that was faced for the first time] (Interview B).

[22] The research sample includes both senior and junior medics (see the theoretical sampling section in Chapter 4.

"*One of the things is the **speed** with which we can acquire knowledge, all the **immediate availability** of this*" (Interview C).

"*Now you're constantly being almost **bombarded** with opportunities to learn things; if you've got the time or if you need to know something, it's **very instant***" (Interview B).

"*I'll have a **quick** look. I forget things, I know I forget things and I now know I can **quickly** top it up by looking it up on the net…I can **quickly** look up the guidelines and **don't have to wait** a week to find out and I think that's a phenomenal, wonderful thing which wasn't there*" (Interview C).

"*I do think that it's a wonderful thing that you can actually acquire the knowledge you need **so quickly** now*" (Interview C).

**Finally, the process of knowledge acquisition is full of emotions, sometimes strong emotions which can be negative and threatening: the** interviewees expressed strong emotions, particularly with regard to criticism from their colleagues, frustration if they miss critical information and a spectrum of emotions related to taking extra exams and the associated feelings of threat.

"*Some people might find it a **threat***" [the need to acquire new knowledge] (Interview B).

Emotions can be triggered by many factors during the knowledge-acquisition process; for example, working in groups. One interviewee said:

*"[It] can make that experience **awful** if you feel that your colleagues around you are critical about what you have done…It'll knock their* [staff subjected to criticism] *confidence and they'll feel less inclined. Let's say it was me, I would feel less inclined to approach them* [critical staff], *less inclined to ask for help next time because I'd feel **nervous** about it* [describing the effects of critical colleagues] (Interview C).

However, the medics sometimes felt safer with supportive colleagues. Another interviewee stated:

"*That was obviously where **they felt safe**…I think, again, it's the phenomenon of being a new Consultant and it's that **safety** blanket that you know you can ask people* [describing how new consultants consult familiar colleagues for advice] (Interview C).

Missing important information that is relevant to decision-making is frustrating:

"*It slightly **frustrates** me if I do buy something and I find that there's a big problem with it*" [describing the need to gather information before buying an appliance] (Interview B).

When some structured examination was introduced to assess the senior doctors' knowledge, the following response was triggered:

"*I **hate** those* [mini tests that are required during or following ongoing training]. *I **hate** it when you get, like that book that John has given me to read about transplants, has got multi-choice questions at the end and you get quite a few journals now where, to prove that you've done the activity, at the end you have to do a little test, they **annoy me**…I'd be **horrified** if I had to sit an exam in my knowledge field again, I think that'd be **quite stressful**, you'd feel now that you've got to get it all right…and you'd **be a bit worried** if you didn't. So I think taking exams now is probably **more stressful** than it ever was if you're talking about taking exams in your professional field. It's quite **stressful**"* (Interview B).

Emotions can affect the readiness to learn: positive emotions such as interest and hope can inhibit other competing goals and ensure a focus on the learning process Fear and anxiety related to a failure ensure the avoidance of circumstances that may have led to such failure. Emotion is an integral part of the knowledge process and, in this setting, emotion provides an interesting dimension to this category. Moreover, emotions can explain knowledge itself, not only the process of achieving it. The core category of this project, knowledge as confidence, undoubtedly has a strong emotional dimension. Confidence is a type of emotion.

### Category 4: Seeking to practice skills

The essence of this category is that practising most skills, from driving a car to operating on someone's brain, if successful, provides immediate feedback that builds confidence in one's ability to repeat these skills in purposeful ways and hence leads one to become knowledgeable. Practice builds confidence, which ultimately establishes knowledge. With repeated practice, the practitioner becomes able to predict the outcomes of their practice, i.e. gains confidence in what they do and so knowledgeable in such practice. Practising driving is an effective way to obtain feedback on how a car will respond to the driver's actions, and this will build confidence in one's driving skills which leads one to become knowledgeable about how to drive a car. One interviewee stated:

"*You get more confidence as you go along because of your experience, your personal experience*" [talking about treating patients using a new trial protocol] (Interview B).

Another interviewee explained the process of gaining experience:

"*But also, alongside that has been not just facts but also experience as well. So difficult to quantify experience - you do something, you do it again, you see it works, or you see it*

*doesn't - so experience isn't always something you can learn, you just acquire it nebulously on the job by doing it*" (Interview G).

One participant explained why his unique experience was important. There is an implicit expression of confidence in the quote:

"*I think there're different strands of knowledge…I see that I bring some strands to the table that no one else brings. Actually, I bring a lot of hands-on, on the ground knowledge. Actually, I do the job every day, so I bring something that others don't, but I'm aware that they bring a lot that I don't as well*" (Interview F).

The analysis of the interviews in this research led to the construction of the following picture: a physician decides to prescribe a particular type of medication to treat a patient's hypertension, based on well-debated information, which led that physician to feel confident in this course of action. On the other hand, a surgeon requires practical training; i.e., long, carefully designed training on how to perform a hernia repair operation. During their first attempt (under supervision), the trainee surgeon may feel nervous and reluctant but, with repeated exposure to this experience, their ability improves to a stage where their performance starts to build confidence in their capability to operate, which makes the surgeon knowledgeable about repairing hernias. Practice is a source of confidence in what one does, and repeated practice creates confidence, which is the final stage of the knowledge process. One interviewee stated:

"*I sometimes kind of compare myself to a surgeon. A surgeon might have a skill he would hone over many years and, as he gets towards retirement, he'd still be at the top of his game because he's more skilled and experienced*" (Interview F).

The analysis of the data related to this category revealed that the category contains several dimensions. **Firstly**, the staff distinguish between practice and theoretical knowledge. **Secondly**, there are several advantages to practice as a way of gaining confidence (knowledge). **Thirdly**, practice is not necessarily an individualistic activity and has a strong social component; and, **finally**, there are situations during which practice (or a lack of it) can adversely affect the process of knowledge acquisition. These dimensions will be discussed below.

**Firstly**, the research participants differentiated between theoretical information and practical experience (knowhow) as sources of knowledge.

"*If you're going through a topic, for example the EB virus and I'm **reading** through it, by going through it, you come across more aspects of the knowledge, which you would otherwise not come across in your day to day **experience***" (Interview A).

"*It's a combination of experience and that's acquired quite slowly, over time. Also reading journal articles, attending conferences, listening to talks and things like that*" [how they acquire knowledge] (Interview G).

The interviewees are learning by doing. Extensive practice is sometimes required in order to master complex tasks and acquire the necessary skills. Medicine is a practical field and it is unsurprising that such views were expressed by the participants during the interviews. It is reasonable to conclude from the participants' views that the earlier scenario of a physician prescribing antihypertensive medications could also be augmented by practice; as the physician sees the reduction in the blood pressure of their patients (practical experience), their confidence in their theoretical information will increase and they will become more confident, i.e. more knowledgeable.

The differences and overlap between know-what and know-how were also mentioned during the interviews:

"*What is it you're wanting to test? Are you testing their actual knowledge, or are you testing what they do with the knowledge? As you get further down your line as a qualified professional consultant, it's not really about what you actually know as facts, it's about what you do with them*" [on constructing tests for senior professionals] (Interview B).

Theoretical knowledge differs from practical knowledge in many ways.

"*It depends whether you're trying to acquire **factual** knowledge about the way things are, **black and white**, or whether you're trying to acquire the **greyer** knowledge that is about what happens with experience*" [on how to acquire knowledge] (Interview C).

The **second** dimension of this category is the high quality of practice as a source of confidence. The research participants valued more highly experience gained by practice than theoretical information obtained by reading. Practice gives them a real feel for the solution to problems and the long-lasting ability to manage such problems. One research participant explained his/her recent experience of treating a patient with a relatively rare complication following transplantation, as follows:

"*Some of the knowledge you acquire with time and experience, so it's having seen scenarios over and over again. …One example is a case that we had this weekend; a lady who the general feeling that she had developed vaso-occlusive disease [VOD] during the course of the weekend* " (Interview C).

This research participant went on to explain how practice was central to building self-confidence:

"*Not that I'd wish that particular condition [VOD] on anybody, but the thing that'd help me the most would be to see several people with it, so it's experience, isn't it? It's repeated exposure to the scenario so that you can then get a feel for the situation, isn't it?*" (Interview C).

Another participant explained how gaining certain practical experience could distinguish him/her from others:

"*I think there're different strands of knowledge…I see that I bring some strands to the table that no one else brings. Actually, I bring a lot of hands-on, on the ground knowledge. Actually, I do the job every day, so I bring something that others don't, but I'm aware that they bring a lot that I don't as well*" (Interview F).

Practical knowledge is better because it is relevant and real. One of the participants explained that:

"*If we're going to use this new drug or whatever, the topic of conversation'd be the all-around practicalities. So the things that the journal doesn't give you in terms of experience; the journal says it works but it doesn't tell you who benefits and who doesn't, what problems there are, how you actually give the drug, what supportive care you need. You kind of get the experience from colleagues rather than the knowledge*" (Interview G).

Another reason that makes practice a better way of obtaining knowledge is that it is direct and provides immediate feedback:

"*The driving part is more of a mechanical process in a way, and if you don't do it properly, then you won't be able to drive, so it's more knowledge followed by the direct application of that knowledge…I think, I'd say that, because you can practise (driving) straightaway and see the results. It's more of a graphical thing - if the gear should have been second, it's immediate feedback*" (Interview A).

The research participants saw practice as a valuable method of learning. The view that practice and experience are better ways of obtaining knowledge (compared with reading information or attending lectures) is represented in the emergent theory from these interviews. The reader can see from the graphs in section 5 below, representing the theory, that the category 'practice' as a route to knowledge is closer to the core category 'knowledge as confidence' than the category 'sources of knowledge'.

The **third** dimension of this category is the social influence on practice. Practising any skills is a process that is greatly influenced by those around us. One of the research participants explained this process succinctly as follows:

*"If you get a new car, a different car to the one you're driving, you're possibly more likely to have an accident or have something happen because it's new, so…one weekend, I*

*came here and I had my husband in the car, and I'd been parking the car in the Consultants' car park…My husband's saying, 'Stop, stop here, we're going to hit something' but I'm not, I know that I'm alright in this particular situation in there. Sometimes, if someone starts interfering with your thought processes, they make you feel nervous and, if fact, you're more likely to misjudge it but, if you've somebody with you. that makes you feel comfortable and is a bit of reassurance for you, you can then feel more comfortable to learn and maybe, you know, try something a little bit newer, different, if you've someone with you who gives you a bit of confidence and says 'Yes, I'd have done that too*'" (Interview B).

The people around us can provide a supportive environment for our learning, but also be a source of disruption with regard to our practical learning. Medical practice is hardly an isolated or individualistic activity. Medical practice mostly takes place with people and for people, so it is unsurprising that such activities have strong social components which, as explained in the quote above, can have either positive or negative consequences.

**Finally**, issues with practice can also adversely affect knowledge building. Three such issues were expressed by the research participants. These are: a lack of or discontinuation of practice, negative feedback from practice, and too much practice (or experience) as barriers to new knowledge.

A lack of practice could jeopardise or delay the process of confidence building. Clinicians are less likely 'knowledgeably' to manage rare disorders that they do not see frequently enough. Practising long enough to master rarities and oddities is what distinguishes the wise senior from the bright junior. One participant explained how practice allowed them to develop experience that replaced dependence on written information:

"*You start to speak to the patients more about your own experience of that way of treating rather than from the book or the trial…As you get further down your line as a qualified professional consultant, it's not really about what you actually know as facts, it's about what you do with them*" (interview B).

Discontinuation of practice could also erode confidence and, with time, knowledge is lost so refreshing it becomes essential. There is a need for continuous practice to maintain knowledge:

*"For instance, managing a haemophiliac, I haven't had to do that for real for 20 years. I wouldn't know exactly what to do…I suppose it's the phenomena of, first you feel that you probably know quite a lot about it, but if you're away from it for a long time, your practical knowledge will fall away because you're not keeping up to date*" (Interview C).

The links between adequate practice and confidence building are expressed by the research participants. Practice can be used in knowledge management as a knowledge

(and confidence) building method. However, of interest is the observation that practice itself can damage confidence directly if the outcomes or feedback related to such practice are negative. After a car accident, the driver may feel apprehensive about driving along the same street where the accident happened, driving the same vehicle or even driving altogether, for a period of time. A failed surgical operation (unless due to factors other than the surgeon's ability) will probably knock the surgeon's confidence and cause a loss of knowledge. Bad experiences influence the choices we make and the decisions we take, by damaging our confidence in a particular course of action:

"*I think, sometimes, some people don't like certain things; it wouldn't be their preferred way of doing something, so that they can be quite negative about a certain choice of treatment because they don't like it, maybe they had a bad experience with it and so they'll say it doesn't work or it causes loads of problems, and when you think 'Actually, hang on here, I'm not sure it really does*'" (Interview B).

In this research, practice build confidence in our skills and this makes us knowledgeable. These findings explain the emotional nature of knowledge.

Too much experience may obstruct new learning. Existing knowledge (or confidence), particularly that held by senior staff, may prevent the adaptation of new, more up-to-date, desirable knowledge and skills. This would hinder further learning. In such situations, a loss of knowledge may become an ideal solution. One interviewee explained:

"*They [*senior colleagues*] rely more on experience and, when newer ideas, technologies and treatments come along, perhaps in the last few years, they take their foot off the gas a bit and coast and rely on their experience. That's an interesting sort of trajectory really which I feel I need to be aware of so, as I approach retirement, do I keep going, all guns blazing, or do I actually at some point, say ALL, actually it's quite critical to keep up to date. If I'm not going to keep up to date, then actually I'll have to get someone else to do it*" (Interview G).

New learning takes place within an existing framework or context of pre-existing knowledge. Forgetting will create space for new knowledge. One interviewee explained:

"*I think of medicine as a bit of a framework and I've got lots of framework around but there are areas that I have filled in the gaps and, with* [leukaemia], *I've filled in the gaps in the knowledge over time*" (Interview F).

In conclusion, practising medical skills was considered by the research participants as a major route towards building confidence (knowledge). It is more effective than a simple awareness of information through the process of reading documents or attending lectures.

Practice is socially influenced and we learn by seeing others practising. A lack of or cessation of practice can adversely affect confidence. Negative feedback from practice, particularly in a destructive way, can damage confidence and cause a loss of knowledge. Moreover, too much practice can create strong self-confidence which could slow down or prevent our ability to forget some learned skills so we can no longer make room for new and more up-to-date knowledge.

**Category 5: Reacting to Peer influence:**

The essence of this category is that: medical consultants feel that medical information must be verified by adequate discussion with credible peers and experts before they can use such information in practice. To the interviewees, information remains provisional and outside their area of knowledge until it has been approved by their colleagues. This approval allows its internalisation and so it becomes knowledge. Peer influence is a critical part of the process of knowledge acquisition, as it directly promotes confidence building.

Peers play a critical role that influences how doctors interact with information and change their practice. The importance of peer interaction in building confidence is explained by the following quotes from the interviewees:

"*I think that having the peer group there is definitely beneficial*" (Interview E).

"*Your perception of what you know or don't know might be increased by being with people who clearly know a lot more about it than you do*" (Interview B).

"*It'll definitely influence me. If my colleagues say it's all absolutely fine, then I'd definitely go ahead with the practice*" [of managing new knowledge] (Interview A).

Obtaining knowledge from an expert rather than reading about it in journals, books, guidelines or web pages was rated very highly. As explained in the category of sources of knowledge (see the previous section), interaction with others, particularly experts, was rated as the best source of knowledge, because this also passes a sense of confidence to the recipient of the information. The interviewees stated:

"*Oh, discussion with an expert, there's no doubt about that*" [explaining the best sources of knowledge] (Interview A).

"*It's a one-to-one conversation* [with an expert] *which's the best if you can. Otherwise, even if it's a group or a talk, then you can ask ques*tions (Interview A).

"*But if you've **somebody with you that makes you feel comfortable** and is a bit of reassurance for you, you can then feel more comfortable to learn and, maybe, you know, try something a little bit newer, different, if you've someone with you who gives you a bit of confidence and says 'Yes, I'd have done that too*" (Interview C).

Interaction with colleagues can provide more detailed information that is particularly relevant to one's work. This is more than just an exchange of information; it offers direct access to colleagues' experience. One interviewee stated:

"*If we're going to use this new drug or whatever, the topic of conversation'd be all around the practicalities. So the things that the journal doesn't give you in terms of experience, the journal says it works but it doesn't tell you who benefits and who doesn't, what problems there are, how you actually give the drug, what supportive care you need. You kind of get the experience from colleagues rather than the knowledge*" (Interview F).

Social interaction is required to gain knowledge by building confidence in information:

[When asked about good sources of knowledge] "*A meeting, if it's being presented by an expert in the field who is actually presenting good data, I'd regard that as being high up on the list and probably more useful than the journals, because you get that opportunity to question and challenge the information you're being presented with*" (Interview B).

Of interest is the observation that peer influence can be indirect or take place from a distance; e.g., over the Internet. This explains the social nature of medical knowledge and so the importance of peer interaction, even in the virtual world:

"*Dr Google. It'd be an online literature search, it's my favourite method…I think the nice thing about the online thing is because you can have the peer-to-peer thing even online. You've got editorials and reviews and discussions and blogs online"* (Interview D).

The analysis of other codes related to this category showed three main dimensions which can help to define this category more clearly. These are: comparing oneself with others, seeking recognition from others and seeking approval from others.

Firstly, comparing oneself with others is a very common theme in the interviews. Such comparisons take different forms and are surprising because the medical practice within a team of practitioners is not supposed to be competitive, unlike the practice in sport for example. Moreover, the tone when expressing such comparisons was not competitive. Doctors were probably seeking the benchmarking of their level of competence:

"*Talking to a person who doesn't know anything about EBV* [a virus], *I'm an expert, but talking to the renal people who have more expertise than me [is different*]" (Interview A).

"*You ask about a point where I know it well and probably that's a point at which I'd know it. How would you define 'know it well'? How do you set that bar? Probably, it would be when I look around and think I actually I know more than other people in the room. So at that point*" (Interview F).

The realisation that one knows more than others is a very satisfying feeling because of the associated confidence (i.e. knowledge):

"*You think 'Oh well, it's common knowledge and everyone else understands it', but if I compare myself with my peers in exactly the same situation, their understanding wasn't as good as what my understanding was…so that was the* ***enlightenment moment*** *for me*" (Interview A).

Knowledge does not seem to be an absolute characteristic. It is relative to others and can fluctuate depending on those around us. This supports the idea that knowledge is our confidence in what we know and this can fluctuate from time to time and from place to place. This constant comparison of one's knowledge with that of others is explained in the following quote:

"*When I was working in London…that centre was the centre for CMV, it was the Reference Centre for CMV Worldwide…and as compared to Sheffield when I came here, CMV was just a service and not many people knew much about it…So from that point of view I did feel that, yes, probably, I know more about CMV and or have actually experienced more about CMV than other people, so it's all a matter of where you are and the amount of experience… at the Royal Free, I'd have said that I don't know much about CMV…At [Sheffield], it'd be much higher…It depends on who's asking the question…It's relative to the knowledge of the person you are talking to*" (Interview A).

Comparing our knowledge with that of others does not always result in positive feedback. There will be occasions when others are better than us and this will knock our confidence and so reduce our knowledge:

"*I am very hesitant to say that I know this very, very well because there will always be someone who knows more…Yes. I can be an expert in, say, the use of [*a medication*] but there will be other people in Europe who have the ability to use [*the medication*] outside the very strict licensing rules that we have to adhere to here so that they have more experience of [it], even the off label uses*" (Interview E).

Worries about how we compare with others in the future were also expressed. This is unsurprising in a knowledge-based community, where knowledge and its uses are doctors' reason for existing:

"*As I approach retirement, actually, it'd be easy for my knowledge to be overtaken by somebody coming up who was less experienced, because they were reading more actively and more engaged with things. So I don't think I'd necessarily lose my old knowledge, but I'd not keep up to date with new knowledge*" (Interview G).

The following quote explains the relief that an inability to manage a particular situation was due, not to the doctor's ignorance, but to a lack of knowledge in that field that no-one really possesses. This summarises the benchmarking attitude of knowledge workers:

"*If I don't know what to do, I'd phone around or discuss with colleagues. Actually, usually, as a result of that, I get half a dozen different opinions and the reason is that there isn't a right answer…it's reassuring. I'm faced with a situation and I don't know what to do, I have a think about it and actually it's not me, it's the situation…I think it's reassuring when everyone else's saying the same thing*" (Interview E).

The second dimension of this category is seeking recognition from others. The doctor who participated in this research explained how the recognition of their knowledge and skills by their peers is desirable and very helpful, because it increases their self-confidence. Such recognition can be very formal, such as passing exams and gaining recognition from examiners:

"*The exams obviously did improve my knowledge and understanding of things, for example, where maybe I knew already but, all of a sudden, when you go through it, number one you understand the background*" (Interview A).

Less formal recognition is based on what others think:

*"Yes, I do, and I think a lot of people seem to think that I'm knowledgeable about it [*MPD, a type of blood disorder*] as well*" (Interview E).

More convincing recognition is received when knowledge and skills are acknowledged by peers' actions, such as sending their patients to you to treat:

"*It's now being reinforced at work by now everyone sends their patients to me and I start to get phone calls … So as I get invites to speak or to sit on advisory boards, now trial committees and things that kind of reinforces the idea that I think about myself that others think I know plenty*" (Interview F).

Recognition by others helps confidence-building in the pursuit of adequate knowledge.

The third dimension of this category is seeking approval from others. A consistent theme in the research interviews is that doctors almost always seek to verify new knowledge by debating it with their peers. Even good published papers in prestigious journals will not be accepted at face value. The medical staff may agree or disagree with the new

developments in their field; however, they are unlikely to change their practice unless such changes are endorsed by their colleagues:

"*It will definitely influence me. If my colleagues say it's all absolutely fine, then I'd definitely go ahead with the practice*" [managing new knowledge] (Interview A).

[When asked about adopting new practice)]: "*No, unless it's something that we discussed as a group and we got some consensus as the group of physicians now, because that's the way we work these days, we don't just go off and decide to give that patient ginger because somewhere in the paper it looked good, you have to actually get agreement from your peers that, yes, it is a good idea and it is safe to use and it needs to be approved by everybody, so that people aren't going to think that you are behaving in a way that is out of consensus*" (Interview B).

[On managing newly published evidence]: "*One of the things I would probably do is discuss it in a journal club setting with other people or basically because…you may miss something that someone treating a different disease-specific area may have*" (Interview D).

The basis of this reliance on colleagues' consensus can be due to a feeling that doctors must follow a system that is beyond their control:

"*I think there's something in the system that constrains us; it's not just funding and all of that, there're guidelines to follow, there're processes. You can't adopt new treatments without them being reviewed and approved*" (Interview G).

The other reason for seeking peers' views is to seek support for one's own decisions. Following difficult decisions, medical staff turn to their peers in search of retrospective agreement on what has been done. This can be explained by benchmarking behaviour or seeking reassurance. The quote below related this to reassurance, i.e. confidence-building:

"*If you get someone who comes along and says 'Yes, I'd have done something similar'…colleagues on the Monday said 'Well, it's very difficult, it probably is what it was' and they'd not have done anything different from what I'd done. Nor would any of the options for treating it have made any difference, it's then kind of reassuring*" (Interview B).

However, this does not always work and reassurance may be denied. This disagreement on knowledge has significant and 'awful' implications for the staff. The quote below shows the emotion associated with this:

*"[*The presence of colleagues around you*] can make that experience awful if you feel that your colleagues around you are critical of what you've done…I'd feel less inclined to*

*approach them, less inclined to ask for help next time because I'd feel nervous about it*" (Interview B).

The social influence on medics is strong. The staff usually seek consensus and group decisions:

"*So, if some colleague came and said, 'I used this on this patient and it's really good', I wouldn't use that as my basis for treating. I'd want to know more about it* ***from a peer review type of situa*****tion**" (Interview C).

Moreover, medical staff are critical of the feedback they receive from their colleagues and they evaluate others' opinions carefully. They seek a well-informed consensus:

"*Most colleagues, when they tell you about things, it's really on the basis of things that they've experienced themselves once or twice…unless they're an expert in that field. the average colleague doesn't know more about it than I do, it's just that they have had the opportunity to try it once or twice*" (Interview C).

A high level of conformity was reflected in the research interviews. This is because medics want to make a correct judgement and assume that others (their peers) have more accurate information on which to base correct decisions. The informational influence is explained by the following quote:

"*I don't get a chance to read every single article…So you can't be an expert in everything… so many studies have been published and a lot of work has been done by people in London and people elsewhere, so that unless I'm part of that team, there's no way that I will know absolutely everything about it, so if I then come across a person who has been involved in those projects, who's done a lot of reading around it, then at least I think the key crucial difference probably will be that the expert'll be able to answer my questions directly where a journal article may not*" (Interview A).

Working in a coherent team was regarded as important by all. The interviewees pointed to the strong pressure upon the medical staff to confirm to their peers' consensus. The quote below explains this:

[When asked about adopting new practice]: "*No, unless it's something that we discussed as a group and we got some consensus as the group of physicians*" (Interview B).

The research participants manage their knowledge by seeking the views of their peers on such knowledge. This, if positive, builds confidence within medical practitioners in the information under discussion. This process is complex and has several dimensions, as negative feedback leads to a loss of confidence and so, ultimately, a loss of knowledge.

The following section present several diagrams to show the coherence of the links between the categories in a form of a theory.

### 5.5. Presenting theory through a series of integrative diagrams:[23]

In this section, the theory is presented through a series of diagrams that include the six main categories. Such integrative diagrams represent the links between such categories. These diagrams showed the increasing complexity and variability related to encompassing most if not all of the data gathered from the research. This was followed by the simplification of the diagrams to facilitate the emergence of a parsimonious theory. The origin of the theoretical codes was explained and related to the primary data.

The six selective categories were related to each other through theoretical codes. The diagram below shows these relationships. It reflects the early stages of the theoretical coding and has been simplified for clarity. The diagram shows four theoretical codes: 1. Trigger 2. Facilitate 3. Encourage and 4. Enhance.

[23] Glaser's coding families (Glaser 1978, 2005) were used to construct the theoretical codes in the diagrammatic representation of the theory.

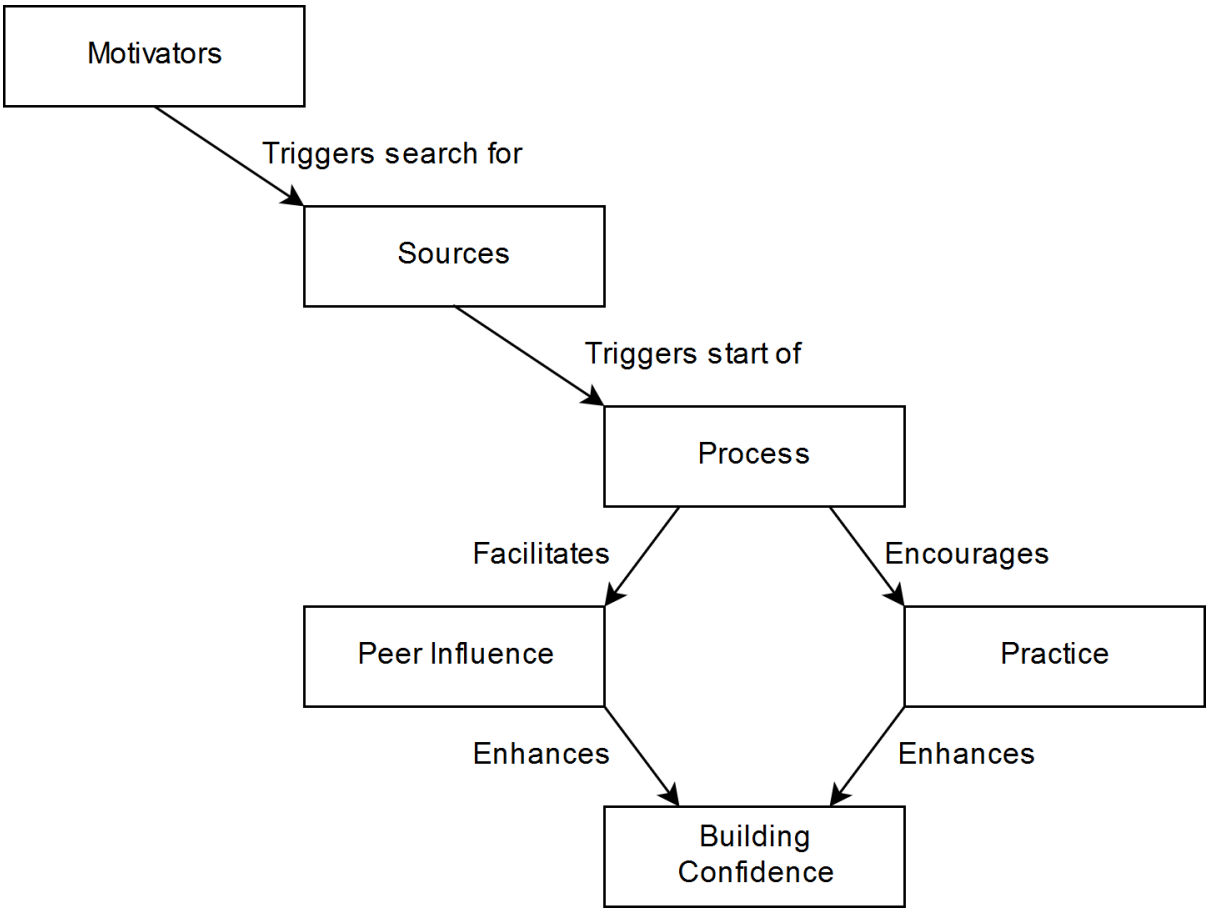



**Figure 5.7:** Theoretical codes explained by an integrative diagram
The six selective codes are related to each other through theoretical codes. The diagram is simplified for clarity.

**Trigger**: This is a causal or a consequence code by which motivation causes a search for sources of knowledge, and the sources of knowledge cause the start of the knowledge acquisition process. In explaining how the presence of sources of knowledge would trigger the process of knowledge acquisition, one interviewee stated:

"*I probably acquire more knowledge now even every week, than I actually did because (a) there is more knowledge to acquire, more is known, so I'm increasingly aware that there're things that I don't know, or I need to know more about… if I see something - I might have liked the cover of the journal or what the article is about - I pick it; I suppose I still do that*" (Interview C).

On explaining how motivation triggers the search for sources of knowledge, one interviewee stated:

"*If you're interested, there's always something more you can learn*" (Interview B).

Another interviewee explained how his interest in a virus (a motivator) led him to search for different sources of information:

"*It is very interesting because EBV* [a type of virus] *causes the development of herpes, and if you look in the books, you find a sentence or a couple of sentences about it. If you really want to dig deeper and someone asks me a question…what I had to do was another spot check to actually get that article of the study from the 1950s and actually, when you looked at it, there was a detailed analysis…Now, 50-60 years later, everyone knows about it, so if you have to ask the details about it, it has all been archived and we may not have access to it*" (Interview A).

**Facilitate**: the process of knowledge acquisition has led to the progression to peer influence as part of a process. On explaining how the process of knowledge acquisition leads to peer support, one interviewee stated:

"*It's more of a peer support, it's an energy where people enthuse each other about the work we're currently doing and seeing the prospects for a better, brighter, better way of doing things in the future and I quite like that because it's also consolidating the theoretical knowledge for the real world and sort of moving things forward*" (Interview E).

**Encourage**: is the code that is used to relate the knowledge acquisition process to the practice of various skills. This means that the concept of a knowledge process has led to or been followed by practice. One interviewee described how starting a process of learning led them to the repeated practice of certain skills:

"*If you try to learn something, or I have to learn something, I might have to keep doing it over and over again. Whether that be a physical skill like playing the scales on the piano or it might be a fact in a book, I have to keep opening the book and reading it and putting the book down and reading it again*" (Interview B).

Another interviewee commented as follows:

"*I think there are different strands of knowledge…I see that I bring some strands to the table that no one else brings. Actually, I bring a lot of hands-on, on the ground knowledge. Actually, I do the job every day, so I bring something that others don't, but I'm aware that they bring a lot that I don't as well*" (Interview F).

**Enhance**: this code relates to the role of practice and peer influence in building confidence. Peer influence and practice lead to a moment when confidence suddenly develops within the knowledge worker. Practice (expressed as experience) can enhance one's feeling of confidence. One participants commented:

"*You get more confidence as you go along because of your experience, your personal experience*" [on treating patients using a new trial protocol] (Interview C).

Peer support can boost confidence:

"*It's not the conference sessions it's the meetings outside, all that kind of chat outside. So it's the informal networking...You kind of get the experience from colleagues rather than the knowledge*" (Interview G).

Peers affect how the medics feel about themselves as well as their level of confidence:

"*How would you define 'know it well'? How do you set that bar? Probably would be when I look around and think, actually I know more than other people in the room. So at that point*" (Interview F).

In Figure 5.8, the six selective codes have been extensively linked to each other using as many theoretical codes as possible to explain the coherence of the resulting theory. This diagram demonstrates such links through several theoretical codes. This diagram is an expansion of Figure 5.7 through the use of many theoretical codes to relate the categories to each other. These theoretical codes were obtained from Glaser's families of codes as well as related to the primary data from the interviews, as follows:

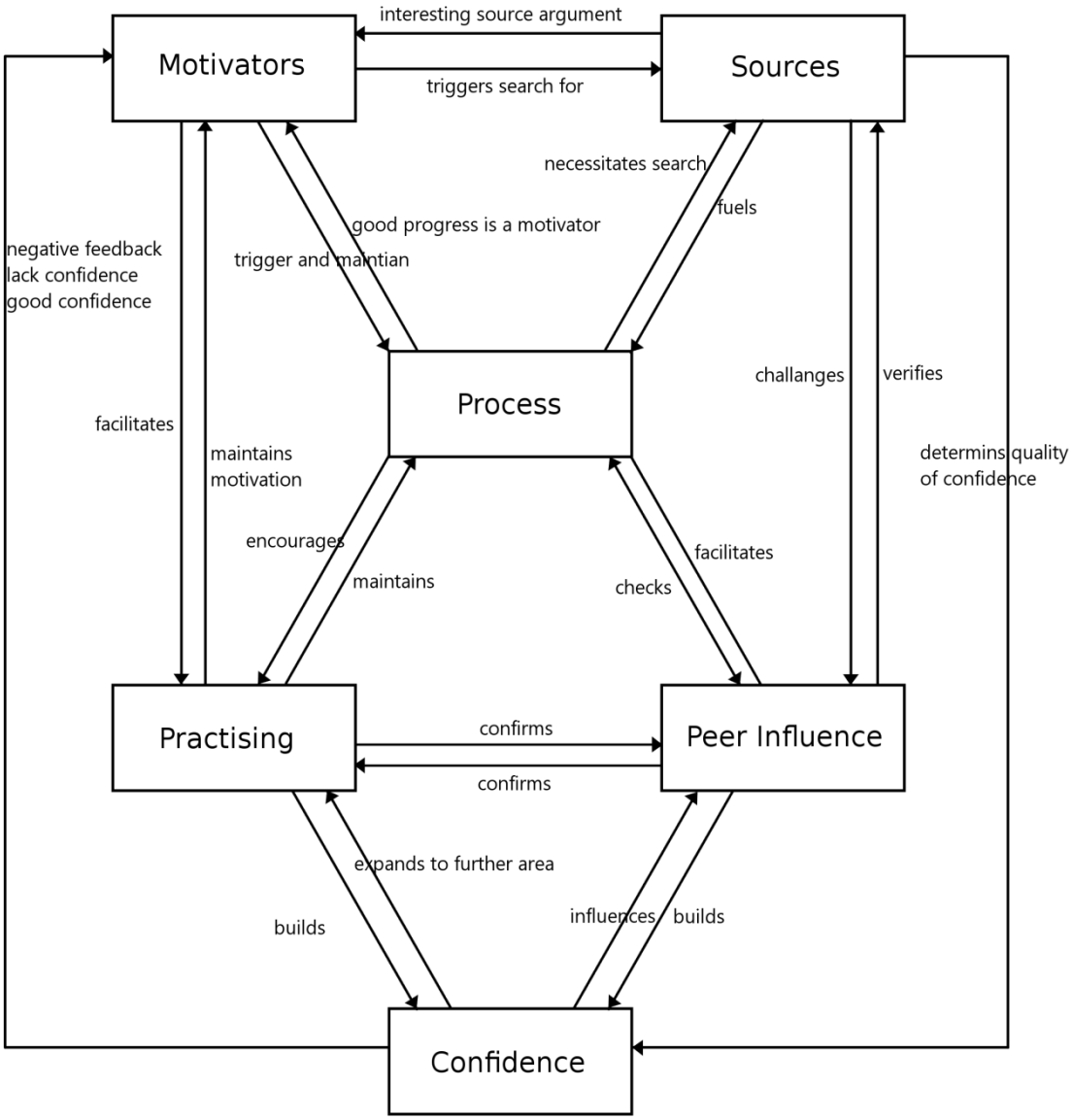



Figure 5.8**:** An integrative diagram of the theory.

Four of Glaser's coding families were found to be useful in presenting the links between the categories as follows:

**The Six C's coding family** (including the **c**auses, **c**ontexts, **c**ontingencies, **c**onsequences, **c**ovariance and **c**onditions): the theoretical codes from the diagram such as trigger, necessitate, encourage and expand could be substantiated by this family of codes.

**Strategy coding family** (includes: tactics, mechanisms, manipulation, manoeuvring, dealing with, handling etc.). Theoretical codes from the diagram such as fuels, challenge, verifies, check and confirm can be related to this family.

**Process coding family** (includes concepts such as stages, phasing, progressions, gradations, transitions, steps, chains, sequencings, etc.). Theoretical codes from the diagram, such as augment, maintain, motivate and facilitate, could be placed within this family.

**Moment capture family** (to capture an intervention that is critical to causing a quick optimal outcome): This could explain the codes in the diagram that led to confidence building, such as: build, enhance, negative feedback and determining quality.

The above diagram is condensed into a simpler diagram that reveals the underlying structures of the theory. So, the first two categories, “motivators” and “sources” of knowledge, were considered as the dimensions of the “process” category. Knowledge acquisition is a process; where such a process starts and ends is subjective to the researcher's views on building the theory.[24] This should simplify the diagram and make the theory more abstract, i.e. not rigidly related to specific codes. Seeing a code as a part or a property of another code helps to deepen the understanding and appreciation of the codes. It is assumed that the process of knowledge acquisition starts by being motivated to search for sources of knowledge. These two items form part of the process and this will lead to the following diagram:

[24] Urquhart explained that “Some researchers, such as myself, would argue that coding is a very subjective process” (2013, p.96).

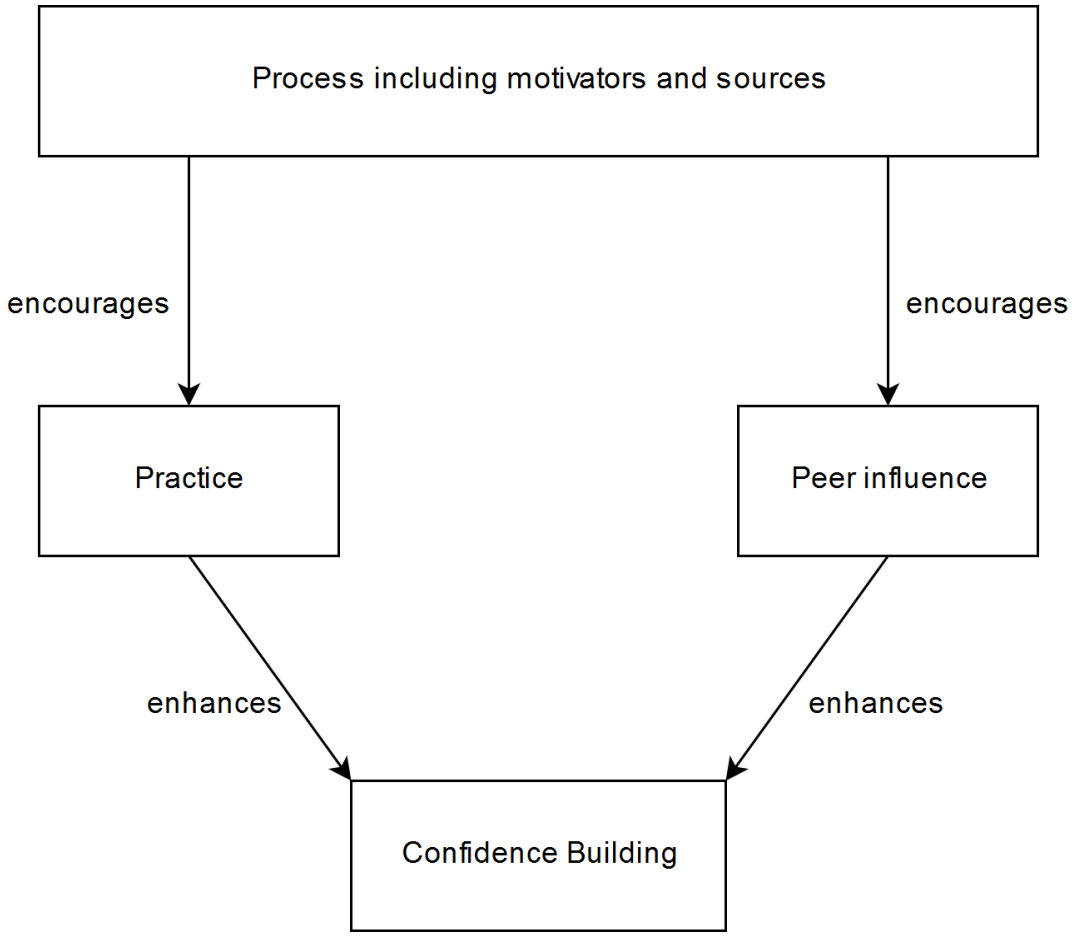



**Figure 5.9**: Theoretical codes explained by an integrative diagram, scaling up the theory by grouping the codes into two larger ones. The process, resources and motivators were grouped into one code.

Moreover, the category of “process” can be used as a theoretical code. This means that this category is used to link the other categories. This could help in two ways. *Firstly*, this would give more legitimacy to the theoretical coding through the use of a theoretical code that originated from the data rather than being transferred from the literature into the analysis. *Secondly*, this further simplifies the diagram and elevates further the theory level of abstraction.

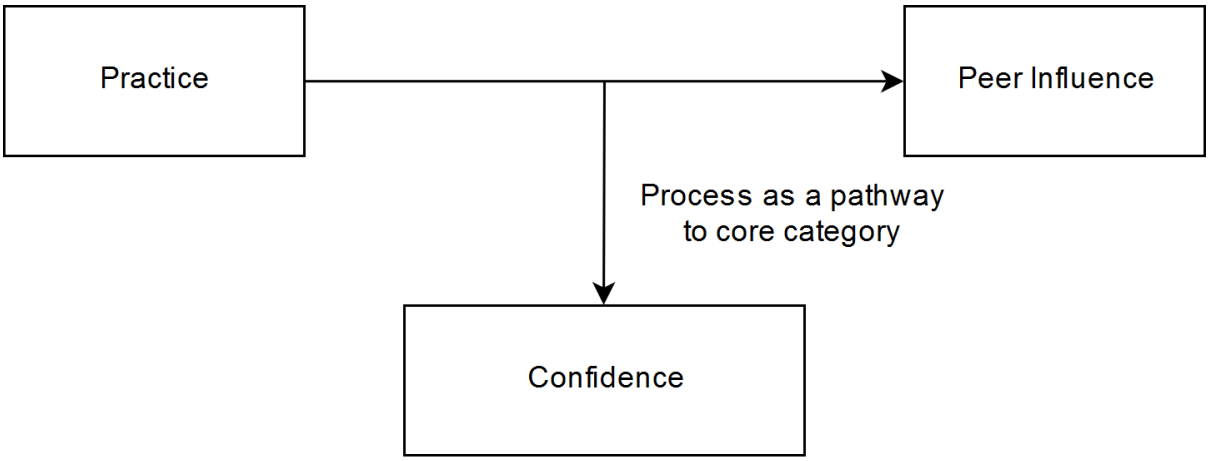



Figure 5.10: Theoretical codes explained by an integrative diagram.
Process is used as a theoretical code to link two selective codes to the core category

The final theory can also be expressed by the following diagram:

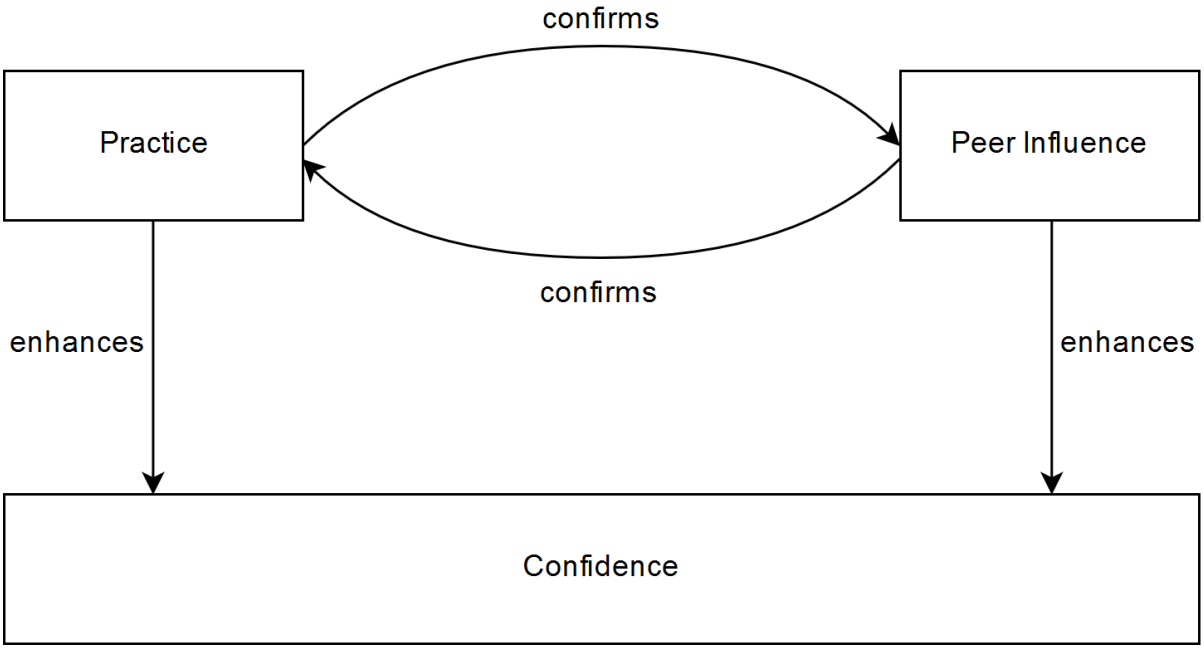



Figure 5.11: Theoretical codes explained by an integrative diagram Another presentation of the final core category and how it is achieved through peer influence and practice.

Figure 5.11 uses two theoretical codes: *confirm* and *enhance*. These codes can be substantiated by open codes from the interview data as follows:

**The theoretical code 'confirms'**: Figure 5.11 shows a constructed link between the two sources of confidence; these are 'peer influence' and 'practice'. These two categories seem to support each other, i.e. practice confirms the feedback from peer influence and vice versa. This theoretical code could be substantiated by Glaser's interactive family of coding.

**The theoretical code 'enhances'**: according to this theoretical code, peer influence and practice could bring the required confidence to the individual. This can be an 'a-ha' moment. This code can be substantiated by Glaser's moment capture family, and covers the situation when an intervention is critical to causing a quick optimal outcome; i.e., confidence building. This could explain the codes in the diagram that led to confidence building, such as: build, enhance, negative feedback and determine quality. One of the interviewees explained this 'a-ha' moment as an enlightenment moment when he realised that he knows:

"*I think the realisation is that you do so much, then you think 'oh well, it's common knowledge and everyone else understands it', but if I compare myself with my peers in exactly the same situation, their understanding wasn't as good as what my understanding was. Yes, you can challenge me on that, maybe I'm wrong, but that was just my subjective feeling and I felt that probably, so that was the enlightenment moment for me. After that. it was a gradual build-up of knowledge - talking to other people who knew much more about it, professors who've been in the field for the last 30 years or so. You can't compare your experience with them but at least you can learn from their experiences. What they published, what they know about it*" (Interview A).

Alternatively, the theory can be presented in two arms, as shown in Fig. 8.6 below:

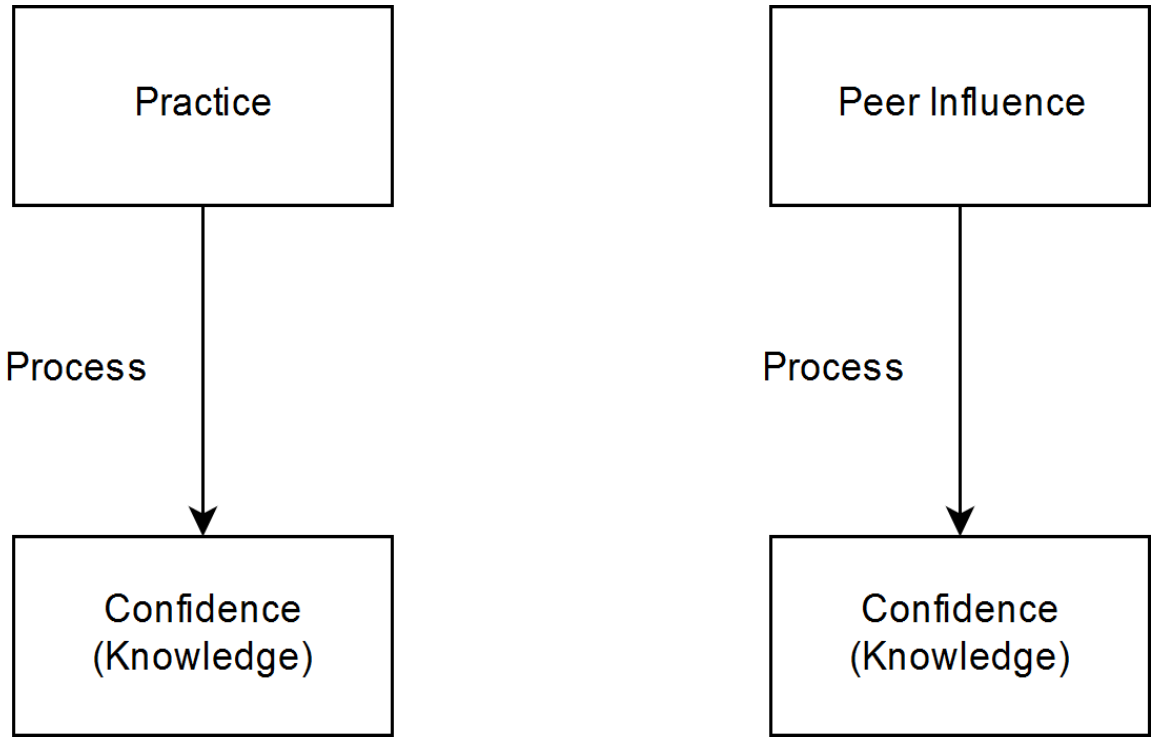



Figure 5.12: The two arms to building confidence.
This is an abstract presentation and it represents the final substantive theory

This two-arm theory does not introduce any theoretical codes that are not constructed directly from the selective coding of the data. This eliminates the potential problem of forcing preconceptions into the theory.

Practising a set of skills (driving a car or operating in a surgical theatre) will provide feedback (mostly quick or immediate), which will encourage desirable practices and discourage unsuccessful actions. The continuous, successful achievement of wanted outcomes will build confidence within the operators, and so they will start to feel that they know how to practise and what to do. The loss of this confidence by de-skilling or the introduction of a new type of practice leads to a loss of knowledge. This loss of knowledge - if appropriate circumstances are present - will trigger the motivation to start a new cycle of practice to rebuild confidence and gain new knowledge. In the other arm, peer influence is used to build confidence in what we know, and what we do, so that we can transform these actions and information into knowledge (or confidence). The two arms of the

constructed theory explain the nature of knowledge, as expressed by the research interviewees, by linking knowing to being confident.

### 5.6. Conclusion:

This chapter tackled the core category of 'building confidence', explaining its dimensions and features. The theory was then presented in several different formats to enhance understanding from different angles. The theory argues that our confidence in what we know (theoretical knowledge) or what we can do (practical knowledge) forms an integral part of the meaning we give to knowledge. Such an understanding of the meaning of knowledge (confidence) can explain the dynamic nature of knowledge as well as shed light on how knowledge can be negatively affected by, for example, poor peer influence and outdated, unreliable sources of information.

This chapter also discussed the five main categories that supported the core category so that it became possible to construct a theory which relates knowledge to confidence. This chapter shows how each of the five main categories can be related to the core category. Some of the motivating factors, particularly the awareness of ignorance, can knock one's confidence and trigger a process of searching for knowledge (or building confidence). The issues with information overload, a problem with the knowledge sources, can have similar effects. The knowledge acquisition process is maintained through practice and feedback from peers. The aim of such a process is to build confidence. The outcomes of practice are a direct and immediate source of confidence (or otherwise) in what we know or what we can do. Peers also provide us with similar feedback, which constantly influences our confidence and knowledge. The management of such categories can influence the core category (building confidence) and hence can have practical applications (see Chapter 6). The chapter concluded by presenting the theory as a series of integrated diagrams.

# Chapter 6
# Discussion

## 6.1 Introduction

This chapter examines the constructed theory of knowledge in light of the existing literature. Grounded theory studies must *"systematically relate the emergent theory to the wider literature…a grounded theory needs to be put into context by mentioning other theories in the field"* (Urquhart, 2013, p. 185, Urquhart *et al,.* 2010). Moreover, there is an obligation to link and analyse the emergent theory in relation to the theories from outside the original field of study (Strauss, 1987, p.282). This chapter follows these recommendations.

The argument in this chapter is that the findings of this research, particularly the concept of confidence as an integral part of our knowledge and so building confidence is what makes us know, are implied in the majority of the knowledge-related literature. Also, knowledge and its management is equally implied in most of the confidence-related publications and experiments. However, the links between confidence and human knowledge have never been adequately developed in any of this literature. The research findings provide new meanings of knowledge which can be used to understand the existing literature in a different light. Moreover, this chapter explains how some of the NHS's current knowledge-based problems can be approached based on the new insights created by this research. The chapter concludes with a discussion regarding how confidence can be managed.

Section 6.2 examines the philosophical underpinning of the constructed theory. Aristotle's concept of practical knowledge supports many of my themes and I propose links between Aristotle's phronesis, which is a slowly developing part of the soul and human emotions, including confidence. Williamson's idea of knowledge as a mental state (not justified true belief) is new to epistemology and supports my theory. The section also critically assesses the notion of knowledge as truth, which is very prominent in academia, and the philosophy of Kuhn is used to support my point. Confidence, after all, is an emotion, not truth, and there is rarely any absolute truth in medicine. This approach allows the pragmatic flexible management of knowledge. Section 6.3 positions the emergent theory within the current meanings of business knowledge; i.e., the objectivist and practice-based perspectives. Section 6.4 examines the relationships and overlaps of the emergent theory with some of the literary classics that discuss the concept of confidence. This includes Bandura's idea

of self-efficacy which comes very close to the concept of confidence as proposed in this research but Bandura stops short of considering confidence as part of our knowledge. Kruger's work on the 'unskilled and unaware' is discussed to show how this can be seen as a knowledge management problem and how confidence can explain the underlying mechanisms of Kruger's observations. This will help me to design a tool for better knowledge management (see Chapter 7). Asch's effect on conformity was relevant to the peer influence theme constructed in this thesis. Asch's original publication discussed confidence on many occasions, but he failed to mention knowledge at all. I provide a new way to understand and analyse Asch's experiments as a knowledge-based problem using my confidence idea, which will clarify some of the NHS's knowledge-related problems.

The above discussion will be used to examine some of the NHS's knowledge-based challenges. Firstly, examples of doctors who harm patients are provided (section 6.5) and I propose a lack of timely feedback from practice or lack of appropriate peer support as the underlying reasons for this problem. Both of these reasons are themes obtained from this research. The second type of problem is related to delays in introducing new advances into the field of medicine (section 6.6). The presence of strong peer support will allow the development of strong unjustified confidence within closed communities of practice, which can lead to catastrophic outcomes, such as the NHS blood transfusion scandal.

The links uncovered in this chapter between the literature, the research themes and the NHS issues will allow the design of a management tool for knowledge that is suitable for the NHS. This is discussed in the next chapter.

## 6.2 The philosophical underpinning of the constructed theory:

Three landmarks are characteristic of the long history of the human struggle to define knowledge (McGlynn, 2014, p.1), Firstly, Plato argued that a true belief requires good justification in order to become knowledge (Plato, 1992, Harrison-Barbet, 2001, p.123). Aristotle extended Plato's tripartite view by providing a classification of knowledge (discussed in Chapter 2). Aristotle differentiated between scientific knowledge and practical knowledge, which resonates well with some of the themes of this research and will be discussed in the next section. The second landmark in the history of epistemology was Edmund Gettier's paper (1963). Over three pages published in *Analysis*, Gettier

provided examples of justified true beliefs that were not knowledge,[25] raised doubts and bequeathed us with what has become known as 'The Gettier Problem'; however, he did not provide any answers.

Gettier's point is that we can hold true beliefs that are based on the wrong types of justification. This shifts the knowledge emphasis from being true to being correctly justified. The ways in we used to justify our beliefs are critical. The interviewees in this research explained how they spend their time justifying their confidence in what they do or what they know through practice which gives them feedback or through structured consultations with their peers. The meaning of knowledge and the routes to such knowledge, as constructed in this theory, take into consideration Gettier's point and adds more weight to the problem of justification that Gettier uncovered. The emergent theory argues that the justification of our beliefs (or confidence) and the regular updating of such a justification are a more critical and more manageable issue for us to consider in the health service than aspiring for the truth.

The third, most recent landmark in epistemology is Williamson's (2000) claim about knowledge, as a mental state, is relevant to the emergent theory of this research. Both Aristotle and Williamson's views will now be discussed in more detail.

**Aristotle's phronesis: the wisdom behind practice:**

Aristotle's views (discussed in Chapter 2) can be used to support four of the main categories underpinning the constructed theory. These are the categories of the sources of knowledge, practice, process and confidence.

The engagement of doctors with sources of knowledge can be problematic. As the theory explains, medical knowledge is not simply the application of facts and information from books and journals. One may think that medicine can be practised by applying hard medical scientific rules as per the notion of evidence-based medicine. However, this approach tends to fail frequently whenever there are competing priorities or goods (Tyreman, 2000). As the interviewees noted, the engagement with medical sources of knowledge is a struggle that requires a great deal of thinking and deliberation. This is what

[25] As an example of Gettier's point, a farmer looks out of his window to check on his cow in the field. He sees her lying under a tree and feels reassured. However, what he actually saw was a piece of white and back paper, while his cow is safe, but lying underneath a different tree. His belief is true but his justification of it is incorrect.

Aristotle called phronesis (Tyreman, 2000), which helps us to link the sources of knowledge with the long knowledge acquisition process and, ultimately, becoming knowledgeable. This sequence represents the emergent theory (see Figure 2, Chapter 5). Doctors thoughtfully engage with knowledge sources as a step towards building confidence, which underpins phronesis.

Aristotle's views were also relevant to the category of practice as one of the themes within the emergent theory. Aristotle argued that good practice requires practical wisdom and this research has shown that effective, successful practice can itself build wisdom. It seems that the relationship between phronesis (as practical wisdom) and practice (such as leading a good life and making appropriate medical decisions) is bidirectional and reciprocal in nature, something that Aristotle himself accepted. Aristotle emphasised the point that practical wisdom (phronesis) is required for good (or ethical) practice. He also accepted that practice is required in order to build wisdom. In this sense, Aristotle agrees with the theme of this theory: that practice is one of the routes to establishing knowledge (by building confidence).

The development of all of Aristotle's virtues, including phronesis, requires a lengthy process, since "*moral virtues, like crafts, are acquired by practice and habituation*" (Aristotle, 2004: 31). Moreover, young people, according to Aristotle, can become wise in mathematics and geometry but "*they are not thought to develop prudence [*phronesis*]. The reason for this is that prudence also involve knowledge of particular facts, which become known from experience; and a young man is not experienced, because experience takes some time to acquire"* (Aristotle, 2004: 156). Aristotle emphasised the presence of a process to acquire practical wisdom, which consists of different stages and takes time. These views are shown in this research by the development of a main category regarding the process of knowledge acquisition. The category of 'process' was very helpful in linking most of the other categories into an emergent theory, as shown in Chapter 6. Aristotle's ageist approach reflects the ancient Greek culture.

Finally, Aristotle described phronesis as a state of mind that is usually a feature of older people (Aristotle, 2004, 160-161). He also explained that phronesis differs from wisdom (as the scientific knowledge of facts) because *"each is a virtue of a different part of the soul"* (Aristotle, 2004, 161). Aristotle did not draw any direct links between knowledge and

confidence, but is describing a type of knowledge that is represented by a state of mind which develops over time with experience and is not simply the mere understanding or mastery of scientific facts. In many aspects, this description is consistent with the emergent theory of this research, which argues that medical knowledge is the mental state of confidence of the medical practitioners with regard to the medical and scientific facts of which they are aware. This understanding is similar in many ways to Williamson's (2000) claims about knowledge, as discussed below.

**The contemporary contribution of Williamson**

Timothy Williamson (2000) claimed that knowledge is a mental state, a claim that resonates well with the emergent theory. Williamson's book (2000) constitutes the third landmark in the history of epistemology. *"Even by conservative estimates, Timothy Williamson's book 'Knowledge and its limits' is one of the most important works of philosophy published in the last twenty-five years"* (Greenough and Pritchard, 2009). This book was the subject of well-constructed debates and analysis by other philosophers, edited by Greenough and Pritchard (2009).

Williamson argued that *"knowledge is a state of mind…A state of a mind is a mental state of a subject. Paradigmatic mental states include love, hate, pleasure and pain…In short, knowledge is merely a state of mind. This claim may be unexpected"* (Williamson, 2000, p.21). Williamson did not include 'confidence' in any of the examples he gave for the mental state, which was possibly an oversight. *"The case for KMS* [knowledge as a mental state] *in KAIL* [Williamson's book, 2000] *is not offered as a simple knock-down argument. Rather, Williamson develops a persuasive overall package of related theses"* (Fricker, 2009, p.32). The importance of Williamson's work to this research is that his proposal that knowledge should be understood as a mental state significantly overlaps with and supports the emergent theory of this research as, after all, confidence is a state of mind.

Williamson also claims that knowledge is unanalysable. He thought that problems with understanding knowledge (including the Gettier problem) originated from the fact that knowledge is considered subordinate to belief. He suggested an epistemology in which knowledge is a central concept (Williamson, 2000, p.5):

*"Experience confirms inductively that the present account implies that no analysis of the concept knows of the standard kind is correct"* (p.30).

Gettier refuted the justified-true-belief argument and no further analysis of knowledge seems to be acceptable, agreeable or plausible. This (according to Williamson) may indicate that '*knows'* is a basic term (or verb) in itself and it is not amenable to further analysis (Williamson, 2000, p.31). He concludes that *"the concept of knows cannot be analysed into more basic concepts"* (p.33); i.e. knowledge cannot be split into being justified, true and belief. Likewise, confidence, I claim, is not analysable into more basic concepts: either you are confident (about a piece of information or particular skill) or you are not. It seems challenging to dissect confidence into smaller concepts, as it appears to be a basic unit of human feeling. There are concepts (according to Williamson, p.31) that are unanalysable, such as 'knows', 'means' and 'causes'. Because these are basic units, they can be used to explain other complex concepts but not *vice versa*. I consider confidence (not included in Williamson's examples) one of these.

Williamson's views are of significant interest to the findings of this research project. Confidence, as an explanation of knowledge, is a mental state and it seems that Williamson's epistemology supports the findings of this project.[26] Moreover, Williamson thinks that the mental state of knowing something is, in itself, sufficient to explain all aspects of knowledge; i.e., there is no need for an extra truth outside the knower. *"To entail knowing, the mental state itself must be sufficient for truth* (Williamson, 2000, pp. 39). These views are highly consistent with the emergent theory in this project. Confidence as knowledge is all that is required, practically, to define knowledge. According to the emergent theory, and from a pragmatic point of view, a confident person is a knowledgeable person even if what he/she knows is wrong, incorrect or untrue (see examples of the knowledge challenges in the NHS below).

Confidence was mentioned in Williamson's book on many occasions. However, its links to knowledge were not fully debated and this may have created small gaps in his debate, probably because confidence was not a primary focus of discussion in Williamson's book. On one occasion, Williamson explains how one's mental state of knowing that one is cold can slowly change: "*One's confidence that one feels cold gradually decreases"* (p.97). Williamson's explanation seems to relate knowledge to confidence. It seems that confidence is critical to one's mental state and so to one's knowledge. On another occasion, Williamson dismisses confidence as a sufficient criterion for building knowledge: "*The point is not that knowing exceeds believing in implied degree of confidence; it need*

[26] Williamson's views were unknown to the researcher prior to completing the data analysis. This is consistent with GT and allowed the emergence of new ideas that are not influenced by the existing literature.

*not. I know many things without being prepared to bet my house on them"* (p.86). Williamson did not regarding knowledge as merely confidence, nor did he debate this in detail in his book. The findings of this research can be used in conjunction with Williamson's views to develop this idea further. Williamson's claim that knowledge is a mere mental state provides a bridge between the findings of this research and the wider philosophical literature.

The emergent theory provides new light to see, examine and understand the views of both Aristotle and Williamson. Although this positions the emergent theory deeply in the existing understanding of the meaning of knowledge, it fails to mask the contribution of this project to the literature, where an understanding of knowledge as a form of confidence is proposed. Issues around appealing to truth are explained in the following paragraphs.

**Philosophical knowledge and the appeal to 'Truth':**

The emergent theory does not share the widely-accepted philosophical view that knowledge is always true. Insisting that knowledge has to be true in order to be knowledge is a highly restrictive concept that could impede attempts to construct a new understanding of knowledge. Williamson (2000) argued that feeling cold is a state of mind and, hence, is knowledge and, hence, truth (p. 96-98). However, sensing cold is a perception and so highly subjective. What about feeling that a particular painting is beautiful? What about certain negative perceptions, such as those related to racism and discrimination? These perceptions, including perceiving cold, can be states of mind and hence (sometimes negative) knowledge, but not truth.

Despite all claims to be based on scientific methods and principles, truth in medical practice is a myth.[27] Andy Carr, Nuffield Professor of orthopaedic surgery at the University of Oxford, explains that *"one of the problems with surgery is that there hasn't been a requirement or culture of clinical trials. We often don't have enough evidence for what we do"* (BMJ, 2017, 358, p. 251). Medical knowledge tends to be provisional and constantly changing. What is right and appropriate now may not be so at some point in the future or in slightly different settings. Moreover, the evidence (or truth) behind what we know may be incorrect. The BMJ[28] contains a regular section on uncertainties within the field of

[27] Medical journals regularly publish concrete data and experimental evidence related to medical practice. However, this DBA project does not adopt a positivist philosophy and so does not consider this angle, but uses a interpretivist philosophy which focuses on the research participants' understanding of the research points. To medical staff, truth in medicine is a challenge.

[28] The BMJ is the leading, most widely-read medical journal in the UK, with an impact factor of 23.6 (2017).

medicine.[29] To show how medical experts struggle with these uncertainties, this section in the BMJ usually contains paragraphs entitled 'What is the evidence of uncertainties?', 'Is ongoing research likely to provide relevant evidence?' and 'What should we do in light of uncertainty?' These examples from a leading medical journal make claims to truth within medicine practice difficult to justify.

Moreover, systematic reviews and meta-analysis are expected to evaluate already published studies. As such, they should provide the busy clinician with a conclusion (a truth) about what is known in the field. However, John Ioannidis, a medical professor from Stanford University, raised concerns regarding "*an epidemic of deeply flawed meta-analysis with the numbers published each year having increased by more than 2600% over the past 20 years, compared with only 50% for research studies of all types"* (BMJ, 2016;354:i5184). Ioannidis was concerned that systematic reviews and meta-analyses have become a source of biased medicine by failing to acknowledging the limitations of primary studies, not taking all contributory factors into consideration and not being transparent to outside reviewers (BMJ, 2016;354:i5184). Issues with information overload and the reliability of the sources of knowledge were raised by the interviewees in this research and were discussed in Chapter 5. Finding what is correct or right to do (i.e., truth) in the medical field is difficult, if not impossible, which precludes the use of truth as a prerequisite to knowledge; otherwise, we would possess very little, if any, knowledge. A pragmatic approach is, therefore, required.

The BMJ also published a recent editorial entitled 'Uncertainty in Medicine' (BMJ, 2017;357: j2180), which criticised the medical community's attitude of suppressing open discussion about uncertainty and focusing instead on successful research outcomes to the extent of promoting harmful self-delusion. Uncertainty seems to trigger anxiety in certain types of clinicians. This view acknowledges the importance of the staff's feelings in managing medical knowledge rather than focusing on hard facts, a view that is consistent with the adoption of confidence as a major contributor to our knowledge. A lack of willingness to acknowledge and embrace uncertainty has led to open disagreements about national guidelines on the management of common clinical scenarios, such as breast cancer screening or hypertension treatment. The editorial also identified overconfidence, where medical practices become accepted through the advocacy of prominent figures rather than careful research (BMJ, 2017;357: j2180). These issues will be discussed

[29] For example, see Mahmood *et al.*, 2016, in the BMJ, on the uncertainties regarding the use of tranexamic acid, a medication used to stop bleeding.

further below, as a concern related to knowledge management in situations where weak peer scrutiny fails to stop authoritarian personalities from promoting their personal views to the detriment of more reasonable 'truth' or 'knowledge'. The editorial referred to a paper (Prasad et al., 2013), published in a high-impact journal, that reviewed articles published between 2001 and 2010. Of these reviewed articles, 363 examined standard practice, 146 of which disagreed with it and suggested the reversal of such low-value practice. This indicates that many of the current routine medical practices are untrue. The editorial advocated the admission of uncertainty as a starting point for fostering greater trust and confidence; i.e., it advocated a lack of confidence as a motivator to search for confidence (i.e., knowledge) and this is exactly the point of the emergent theory, where ignorance is used to challenge confidence, which leads to the further search for more sources in order to build better confidence or knowledge.

Changes in medical practice are a constant theme in the life of a medical practitioner. Probably because most of the current chronic and fatal diseases are incurable, intense searches for better practice dominate the news. Every week, the BMJ publishes the results of new research, which not only changes practice but also casts doubt on what doctors have been doing for quite a long time. For example, on 3 June 2017, the BMJ reviewed a study published in the Journal of the American College of Cardiology (BMJ, 2017;357: j2635), which concluded that only patients with heart failure following a heart attack would benefit from the use of beta blockers (a type of medication). This conclusion immediately made obsolete the current UK national guidelines (which recommended the use of beta blockers for all patients following a heart attack).[30] Although the practical switch to new guidance sounds easy, the psychological impact on practitioners who have been (over)using this type of medication can be profound. They will remember all of their patients who have been given beta blockers unnecessarily, and also be acutely aware that anything doctors do now could be proven to be wrong at any time in the future. This is clearly a desirable advancement in the field but also has an emotional impact on the staff, as suggested by the BMJ editorial. Although rapid changes are currently observable in all walks of life (IT, astronomy, archaeology, etc.), healthcare-related issues are sensitive and closer to people's emotions. The concept of truth in the current medical knowledge is highly dynamic, difficult to pin down and different from other situations, such as a philosophy class. Kuhn (1996) dismisses the appeal to truth in the field of scientific knowledge (see

[30] See the NICE guidelines at: https://www.nice.org.uk/guidance/cg108/chapter/1-Guidance#treating-heart-failure

section 7.6), instead defining knowledge as whatever a group of scientists agree by consensus: we make our knowledge, and do not obtain it from outside (Kuhn, 1996).

Truth is an elusive concept in medicine. Rather than searching for truth, medical staff aim for what works, try it and seek a consensus on its uses. Medical knowledge cannot be linked to truth, particularly when most senior clinicians have seen their practice change, sometimes dramatically, over the years. A DBA is a pragmatic practical research project which aims to identify solutions to business problems, whereas the philosophy of knowledge aims to debate principles of thinking, even if these are highly theoretical in nature and lack any direct applications (at present). The fact that confidence, in this research, has been found to be a significant component of the current medical knowledge and not necessarily truth, makes the emergent meaning of knowledge pragmatic, reflects the feelings and views of the staff and is able to provide new insights into the NHS's knowledge problems and their possible resolutions.

**Confidence in the light of the philosophy of science:**

Kuhn's (1996) theory on science posited three concepts, all of which are relevant to the outcomes of this research. *Firstly*, Kuhn agrees with the theme of peer influence, as constructed in this thesis. According to Kuhn, people (or scientists) practice within groups and are strongly influenced by each other. They keep practising within a particular paradigm and it is unusual (or impossible) for one to depart from such a paradigm without consequences. Kuhn writes: *commitment and the apparent consensus it produces are prerequisites for normal science"* (1996, p. 11). Kuhn described such practice as 'normal science'; i.e., accepted but not necessarily accurate or the most up-to-date science. Kuhn clearly describes some of the views of this research's participants, who felt that their knowledge must be verified by their peers and that disagreement with colleagues is uncommon or undesirable. However, over time, this would allow the emergence of scientific questions and problems that are unsolvable under the existing ways of thinking. Kuhn's idea of a normal 'closed' scientific circle is consistent with the circular knowledge scenario outlined in Chapter 5 of this project.

*Secondly*, Kuhn agrees that knowledge (or science) is highly subjective, developed by people within people and is not truth. In this sense, Kuhn is closer to the notion of an emotion rather than objective facts and this reflects the core theme of this thesis: that confidence forms an integral part of our knowledge. Kuhn thought that the subjective nature of science was so influential that the aesthetic nature of knowledge can facilitate its

acceptance and a new theory can be supported by individuals because it is “neater,” “more suitable,” or “simpler” than the old one (Kuhn, 1996, p.155). According to Kuhn, knowledge (in the form of new theories or scientific laws) is not a justified true belief, but a product of human consensus, based on people’s changing and fallible views and emotions.

*Thirdly*, and most importantly to this thesis, Kuhn described the strong, sometimes violent, emotions that control the process of knowledge building within science. Kuhn argued that science can only advance by breaking the walls of a paradigm in a revolutionary manner.[31] This usually happens when enough unanswered questions and other problems accumulate in an existing paradigm, leading to a ‘crisis’ (Kuhn, 1996, p.153). Kuhn's writings explained the struggle and sometimes aggression that can accompany certain scientific breakthroughs and how *some scientists, particularly the older and more experienced ones, may resist indefinitely”* (Kuhn, 1996, p.150-2). The effects of changes in knowledge and the emotions associated with such changes were expressed by the research participants, particularly the senior ones (see Chapter 5). Kuhn's theory of scientific revolutions is consistent with the emergent theory of this research and opens the door to a discussion around the implications of having very strong, rigid peers as well as situations in which one’s peers are particularly weak and ineffective. The implications of such situations on the NHS are discussed later in this chapter.

### 6.3 The constructed theory within the existing meanings of business Knowledge:

This section examines the constructed theory’s relationships and overlap with the contemporary views of knowledge, both the objectivist and practice-based perspective (discussed in Chapter 2, section 2.6).

The constructed theory does not adopt the full objectivist views on knowledge and considers that ‘objective scientific knowledge’, usually expressed as data, information, conclusions, statistics etc., is only a tool for building confidence. Hence, this objectivist knowledge (data and information) can facilitate the development of more relevant[32] knowledge (confidence) within people. The constructed theory acknowledges the importance of objectivist information, data, statistics, etc., and the need to manage these components carefully, as they influence confidence. Issues related to the availability of information, including overload and the doubtful credibility of certain sources of data and

[31] Hence the title of his book: The Structure of Scientific Revolutions.
[32] Relevant to the research participants.

information, as well as inaccurate conclusions, were discussed in Chapter 5 (section 5.3). However, these influential components were not the real knowledge that the medical staff involved in this research project aspire to achieve. The real knowledge is an emotion (confidence), not an object. Examples of how the NHS manages the information flow and the associated difficulties were discussed in section 2.6.

The practice-based approach to managing knowledge (see section 2.6) proposes knowledge that is, among other things, "*socially constructed and culturally embedded"* (Hislop, 2018, p.37). The constructed theory is closer to this view than to the objectivist view. Peer influence, one of the main categories used to build this theory, is clearly a social process. Also, practice, the main theme underlying this perspective, is one of the main categories used to construct this theory (see Chapter 5). However, the constructed theory adds two further important points to the practice-based perspective on knowledge management. These are: *firstly*, the constructed theory explains the mechanism behind the practice-based perspective, and the reasons why this approach was found to be working on many occasions. Building confidence is proposed as a final step in the process, which allows practice to build knowledge (i.e., confidence). The current literature on the practice-based view fails to explain how and why such an approach works (section 2.6). *Secondly*, this theory explains how knowledge can be built with practice but without social influence; an example would be a person who is stranded on a desert island in the middle of the ocean, who can still learn through practice (to fish, build a boat, etc.). This practice (if successful) will build the individual's confidence and allow him/her to claim knowledge about these practices, without having any direct social influence. However, such knowledge will be extremely limited. Knowledge, according to the constructed theory, is a psychological phenomenon that is, on many occasions, socially influenced. Knowledge is not a pure social activity. Medical staff who work in isolation are prone to adopt the isolated islander approach and develop knowledge based on their limited practice, which can be problematic for the NHS. One neurologist harmed many children by misdiagnosing their epilepsy. Although this neurologist worked in a busy teaching hospital in central England, he was actually living on his own island and was extremely isolated from a knowledge point of view (Chadwick and Smith, 2002).

The constructed theory encompasses both perspectives on defining knowledge that are currently used in the field of business administration. The objectivist's knowledge materials

are used to fuel a knowledge process that is heavily practice-based. However, the aim is to enhance the staff's positive feelings about what they know or what they do. The next section examines some of the classical research on the concept of confidence.

### 6.4 The constructed theory in the light of the confidence research:

This section discusses the emergent theory in the light of the existing research and theories that have explored, albeit indirectly, the relationship between confidence and knowledge, learning and performance. This includes: Bandura's concept of self-efficacy, Cialdini's book on influence, Kruger and Dunning's work on the 'unskilled and unaware' and, finally, Asch's experiment on social conformity. The discussion below explains how the emergent theory can be used to link all of these concepts together and provides a new, unifying understanding of the issues raised by these authors.

**Bandura's social cognitive theory;**

Albert Bandura's observational learning theory, known as social cognitive theory (Bandura, 1977), was based on evidence that learning takes place by observing others; i.e., learning takes place in our brains as a cognitive process, without necessarily needing practice. This is because *"Learning occurs through observing others, even when the observer does not reproduce the model's response during acquisition and therefore receives no reinforcement" (Elliott et al., 1996, p.216).* In this sense, social interaction with others provides learning. This process is consistent with one of the categories of the constructed theory, peer influence, which is seen to build confidence or, according to Bandura, helps learning. The link is that observing others encourages learning (according to Bandura) by enhancing confidence (according to the constructed theory).

According to Bandura's theory, reinforcement acts on the cognitive processes, including motivation, rather than on the behaviour itself, and this is why Bandura thinks that this will lead to stronger, longer learning than would reinforcing behaviour directly (Bandura *et al.*, 1963). Bandura's theory supports the emergent theory's view that peer influence is critical to learning. More recent work by Bandura (1997, 2001 and 2002) (also explained in Snowman and McCown, 2015, pp.296-297) produced the idea of *triadic reciprocal causation*. According to this concept, learning is the outcome of the interactions between three groups of factors. These are:

***Personal characteristics***: including mental and emotional factors (such as goals and anxiety) as well self-efficacy (see below).

***Behavioural patterns***: including self-evaluation, observation, and behavioural changes to overcome obstacles to learning.
***Environmental factors****:* including physical and social surroundings as well as the people around us and their effects on our learning.

These factors work together in a cycle and so strongly influence each other. For example, a doctor may treat a patient using a particular therapeutic modality (behavioural factor, or the practice of skills according to the constructed theory), but the patient does not respond to it (environmental factor). This makes the doctor feel uncomfortable and dissatisfied (personal factor, or loss of confidence according to the constructed theory), who then tries a different approach (behavioural factor).[33] Whilst the behaviourist theories of learning insist that environmental factors are most important in terms of influencing behaviour, Bandura's theory stipulates that personal characteristics (or confidence in terms of the findings of this research) are far from doing so (Snowman and McCown, 2015, p.298), particularly his concept of self-efficacy.

Bandura's concept of self-efficacy is relevant to the emergent theory. Self-efficacy is one of the personal characteristics that influence learning (Bandura, 1997, 2001, 2002). Whilst self-esteem is a general term, used to describe one's overall evaluation of oneself, self-efficacy is *"how capable or prepared we believe we are to handle particular kinds of tasks"* (Bandura 1997, 2001, 2002, quoted in Snowman and McCown, 2015, p.299). Self-efficacy is important because it can affect learners' optimism regarding the outcomes of their behaviour and their motivation to undertake activities. In his argument, Bandura links confidence with motivation and this is one of the relationships that were used to construct the theory in this research:
Using Bandura's idea, students who possess identical mathematical skills may have different levels of self-efficacy and so perform differently in exams. Those with high self-efficacy (i.e. who are more confident) are likely to work harder because they feel that they can achieve more. Those who doubt their capability are more likely to give up at an early stage (Snowman and McCown, 2015), which may explain good or poor performance.

Bandura's concept of self-efficacy overlaps with the core category of the emergent theory from this research: that 'knowledge is confidence in what we know or what we can do', and many of the examples and mechanisms provided by Bandura can be explained by the emergent theory. In particular, Bandura explained that performance accomplishments

[33] Similar examples were provided in Snowman and McCown, 2015, p.297

(practice) and verbal persuasion (peer influence) increase self-efficacy. This resonates well with the views of this research that practice and peer influence help to develop confidence. However, Bandura did not link knowledge to confidence or self-efficacy as a single or overlapping concept. Bandura concluded that high self-efficacy leads to desirable mental and behavioural actions (Bandura 1997, 2001, 2002). He thought of self-efficacy as a stage in a long chain of learning and particularly associated it with self-regulation (or motivation); i.e., high self-efficacy leads to better self-regulation, during which one will be able to work and think harder, manage one's time better and so be more likely to achieve more. He considered self-efficacy as a step rather than a product. The emergent theory of this research sees confidence (i.e. self-efficacy) as an end product in itself; i.e., confidence is the ultimate goal of learning. Bandura's concept of self-efficacy does not provide an understanding of knowledge that will allow the management of the knowledge problems currently observed in the NHS (see section 6.6 below). Bandura did not include or discuss false self-efficacy as a harmful concept.

**Cialdini's views on influence:**

In his important book on influence, Robert Cialdini (2007, pp.219-220)[34] relates how a doctor who attended a patient who was experiencing pain and infection in his right ear prescribed eardrops for the right ear. The doctor, as usual, wrote this in abbreviated as drops into 'R ear'. The nurse read as 'REAR', and promptly put the eardrops into the patient's anus. Neither the nurse nor the patient questioned the reasoning behind this. Cialdini attributed this to the persuasive effects of an authority (a doctor), explaining: *"the important lesson of this story is that in many situations where a legitimate authority has spoken, what would otherwise make sense is irrelevant"* (Cialdini, 2007, p.220). Cialdini provided a theory of persuasion based on several factors, two of which are relevant to this discussion (social proof and the principle of authority), as both can affect our confidence. In some sense, the emergent theory overlaps with Cialdini's arguments and, in many respects, provides an alternative understanding of his examples. Rather than authority, the apparent confidence which must have been shown by the doctor in the example above may have been perceived as a sign of knowledge by the nurse and the patient, and they both assumed that the doctor knew best. This is implicitly expressed by Cialdini when he describes the principle of social proof:

[34] Robert Cialdini is an experimental social psychologist, interested in the psychology of compliance, persuasion and influence. For a review of his work, see Ian Wallis, *Business Gurus*, 2012, ISBN 978 1 78059 048 6.

*"One means we use to determine what is correct is to find out what other people think is correct…The tendency to see an action as more appropriate when others are doing it normally works quite well. As a rule, we will make fewer mistakes by acting in accord with social evidence than contrary to it. Usually when a lot of people are doing something, it is the right thing to do* (2007, p.116)…*In general, when we are unsure of ourselves, when the situation is unclear or ambiguous, when uncertainty reigns, we are most likely to look to and accept the actions of others as correct*" (2007, p.129).

Cialdini goes on to explain how such an approach can cause problems; for example, if exploited through advertisement. Cialdini was probably describing how people manage their knowledge - or the lack of it - by turning to others for approval. The nurse lacked confidence and so behaved as an ignorant person. This reflects, in many aspects, the emergent theory and further substantiates the view that managing knowledge involves, in essence, managing confidence to the extent that knowledge and confidence are practically the same concept. A confident nurse would have said that this REAR ear drops does not look right and questioned the doctor's advice, which would have led to better treatment for the patient. This explains how knowledge and confidence overlap and interplay in healthcare, with different outcomes for patients. Enhancing the staff's confidence in what they know or do will make them better knowers.

**Kruger and Dunning's 'unskilled and unaware':**

The concept of 'unskilled and unaware' was described by Kruger and Dunning (1999) in terms of three points: success depends on knowledge; people differ widely in the knowledge they apply; and, when people are incompetent, they not only apply the wrong knowledge but also fail to realise their failure. The latter was the focus of Kruger and Dunning's research, who completed several experiments, during which they evaluated the volunteers' performance of certain tasks as well as collecting feedback from the volunteers regarding how well they thought they had performed. Kruger and Dunning noticed an 'above-average effect', where poorly performing participants overestimated their skills, which they attributed to a defect in metacognition' i.e. our ability to know how well we are performing. Metacognition itself – Kruger and Dunning argued - is related to the skills under discussion. Kruger and Dunning (1999) explained:

*"In essence, we argue that the skills that engender competence in a particular domain are often the very same skills necessary to evaluate competence in that domain"* (p. 1121).

For example, when one is writing grammatical English, the skills that allow one to write a grammatical sentence are the same as those that allow one to recognise a grammatical sentence (Kruger and Dunning, 1999). Kruger and Dunning suggested that one way to

encourage people to recognise their incompetence (improve their metacognition) is to make them competent (p.1131), but this appears to be a circular argument. However, issues with metacognition can also affect competent people. Interestingly, Kruger and Dunning also found a bias in the assessment of the highly competent people with regard to their competence, as they tended to underestimate their performance. Kruger and Dunning's experiments showed that incompetent people are overconfident while competent people are unconfident. Kruger and Dunning directly linked people's problematic knowledge (incompetence) to their inability to recognise their incompetence (overconfidence), and suggested that the lack of insight (overconfidence) might be reduced by counteracting people's incompetence (lack of knowledge).

Kruger and Dunning's views resonate well with the emergent theory of this research and their paper (1999) provides a useful landmark in our understanding of knowledge and its management in the light of the emergent theory. The concept of 'unskilled and unaware' has been researched in the field of healthcare (Sawdon *et al.,* 2014; Abadel *et al.*, 2013; Todhunter, 2015) as well as in other disciplines (Ainscough *et al.*, 2016; Erickson *et al.*, 2015) and found to be very common (Grissinger, 2017). The 'overconfident effect' was frequently blamed for the mismatch between knowledge and knowing knowledge (Grissinger, 2017). This concern might be better tackled if we accept the link between knowledge and confidence. The view that managing confidence is required to achieve a good working knowledge lies at the heart of the emergent theory of this research. Different reasons for why people misjudge their competence were suggested. Kruger and Dunning (1999) proposed a lack of metacognition, while Kim *et al.* (2015) proposed an emotional explanation, in which *"the unskilled are motivated to ignore (be unaware of) their poor performance so that they can feel better about themselves*"; i.e., are "*unskilled and don't want to be aware of it"* (Kim *et al.*, 2015). In their experiment, Kim *et al.* found that people's estimation of the quality of their performance was related to how much the type of work performed was relevant to the self (in other words, how emotionally influenced they were by the outcomes of their failure).

The emergent theory addresses the concept of 'unskilled and unaware' and provides a pragmatic remedy for it by stipulating knowledge and confidence as a single or extensively overlapping concepts. Knowledge is hard to define (see Chapter 2); the emergent theory removes this problematic term from the discussion and focuses on the management of confidence (or over-confidence) to achieve good performance. Instead of improving metacognition (as proposed by Kruger and Dunning), the emergent theory proposes

feedback as a way to control confidence. The emergent theory describes a knowledge cycle (Chapter 5) in which the knowledge process is a dynamic cycle in continuous motion and the staff are exposed to both positive and negative feedback (from peer input as well as from their own practice) which should continuously adjust their confidence and overconfidence.[35] This model provides knowledge managers with a number of thoughts about how to influence the process of knowledge acquisition and updating, as required by healthcare services (discussed in Chapter 7). The next section examines one of the most famous social experiments on peer influence, or what is known as the Asch effect.

**Asch's experiment on social conformity:**

The other psychological concept to be considered is social influence through conformity. During his famous experiment Asch (1951) asked one participant at a time (within a group of confederates) to point to one of three lines that was equal in length to another line. The correct comparison is usually easy to make. However, the confederates were instructed to point to a particular wrong line. This influenced the participants on many occasions and so led them to agree with the group and give the wrong answer. The participants who were asked to take part in the experiment without the involvement of confederates pointed to the correct line on most occasions. Asch thought that *"the primary factor in this case was loss of confidence*" (Asch, 1951, p.182). Asch quoted one of the yielding participants as explaining: *"If they had been doubtful I probably would have changed, but they answered with such confidence"* (Asch, 1951, p.182). Asch concluded that *"he lost clear reasons for his actions and could make no reasonable decisions"* (Asch, 1951, p.183) and that *"these subjects report that they came to perceive the majority estimates as correct…these subjects suffer from primary doubt and lack of confidence"* (Asch, 1951, p.184); i.e., a lack of knowledge.

Asch's experiment was very informative. It obviously linked the types of interaction between individuals and their groups to confidence or the lack thereof. The experiment also demonstrated how such confidence could change what one knew and so one's subsequent actions. Asch's work on conformity was replicated, reanalysed and criticised (Hayes, 1994). In an interesting subsequent analysis of Asch's data, John Turner (1991) pointed out that the feedback obtained by Asch from the conformant participants after the experiments showed that the participants were not simply trying to conform with the group to avoid social backlash, but actually doubted their own judgement and decisions and so

[35] Kruger and Dunning (1999) also considered feedback but only as a method for improving metacognition.

lost confidence (i.e., they moved from one type of knowledge to another, regarding the length of the line) and so this was more than a conformance tactic. These participants seem to have voluntarily changed their mind; i.e., changed their knowledge. Asch's data can be reconsidered and the experiment can be re-analysed using the emergent theory.

Asch's work could be viewed in a different light using the emergent theory from this research. Asch's experiments, I argue, were based on knowledge, what the participants knew or thought they knew (about the length of the lines) and what others (the confederates) did or chose based on their knowledge (of the different lengths of those lines). Asch described how the participants managed their knowledge by changing their views in order to make choices. These knowledge experiments linked the influence exerted by others to the participants' confidence, which led the participants to change their actions (choices). In the quotes above, from Asch's original paper, the swapping of the word 'confidence' with the word 'knowledge' does not make any difference to the meanings of the sentences. The problematic concept of knowledge can be explained by using 'confidence' instead, and this supports the core concept of the emergent theory. 'Confidence' appeared several times in Asch's paper, while the term 'knowledge' did not.

This section has discussed knowledge and confidence from the psychological point of view, and has shown how people's actions - whether using ear drops wrongly or selecting a line of an obviously incorrect length - are related to people's confidence (or lack of it) in their ability and understanding, and this confidence is directly influenced by the choices and behaviour of those around us. This analysis supports the emergent theory and shows how this theory can provide different explanations to existing concepts within the field of psychology. The following two sections discuss two types of knowledge management difficulties that are currently facing healthcare services, including the NHS.

### 6.5 NHS knowledge challenges: the harmful doctor

This section discusses how issues with doctors' knowledge can harm patients. This section discusses pure knowledge-related harm. This is when a doctor makes a decision that is wrong because the doctor holds an incorrect belief, although such a belief may be justified to them at a particular point in time. The concept of unskilled and unaware was discussed in section 6.4. A few examples from the NHS illustrate this and show how the emergent theory can provide a different understanding for managing this knowledge-based problem.

In 2001, an NHS consultant paediatric neurologist was suspended for over-diagnosing children with epilepsy. This resulted in hundreds of such children being labelled with the illness and continuing to receive unnecessary treatment, with all of the associated side-effects (Chadwick and Smith, 2002). The roots of this malpractice originated from the fact that, although this doctor was working in a busy teaching hospital in central England, he was significantly professionally isolated (Chadwick and Smith, 2002). There were no other paediatric neurologists in the Trust, neurology discussion forms, regional or national links to the department, or systematic audits of practice. This doctor followed a knowledge acquisition process very similar to that constructed in this research, albeit with catastrophic outcomes. He was motivated to know about epilepsy because of the nature of his patients (workload was identified as a motivating factor in this research). He sought knowledge from journals and books. As explained in the finding chapter, finding and following sources is naturally difficult and full of challenges, such as information overload, uncertain and immature sources. He neither received nor requested help to manage the sources problems. He progressed with practice, where he managed children as epileptic and gave them drugs. As the children did not have epilepsy in the first place, their symptoms (an odd convulsion that may have been related to an infection) disappeared, which gave the doctor false feedback that his approach was effective. This feedback boosted his confidence and he continued with his futile practices. This doctor may have tried to improve his knowledge by reverting to his sources, reading more journal articles and books. Moreover, his practice continued to provide reassurance. This doctor's misplaced confidence was the problem. The lack of timely peer feedback allowed the continuation of a harmful practice. The Neurology Department of the Trust at that time lacked a knowledge dynamic cycle similar to that described in Chapter 5. The implementation of a confidence management system (see management tools in the next chapter) would have managed this problem at a very early stage.

Another story of harm provides a different view of the process of building confidence. In 1998, the Lancet[36] published a paper by Wakefield et al., and a further paper in 2002 by O'Leary and Uhlmann.[37] These papers raised concerns that the MMR vaccine was associated with or could lead to autism. Careful scientific examination of these papers

[36] The Lancet is an influential British medical journal with an impact factor of 53.3 (2017).
[37] The Lancet retracted both publications due to a lack of credibility.

showed that these publications did not prove, confirm or explain anything (Cox, 2010; Goldacre, 2009). However, the media coverage of these claims was intense and the subsequent reaction of the public was strong, leading to catastrophic outcomes. For example, due to the low uptake of vaccination, 1,144 children caught measles in 2009 alone and a survey in 2006 showed that only 20% of parents did not think that the MMR vaccine and autism were linked (Cox, 2010). The significance of this story to this thesis is related to the unusual confidence that Wakefield and his colleagues showed at conferences and when talking to the press, that seemed to give creditability to their flawed conclusions. This badly knocked public confidence and so parents started to refuse the vaccine. Peer influence started to resist the false claims and the confidence in peers grew slowly but strongly. Ultimately, other doctors in the field (the peers) strongly opposed Wakefield and his colleagues and proved their flaws. One may think that this was a knowledge problem, where false, incorrect or misleading facts needed to be corrected. However, a close examination of the story (see Cox, 2010) does point to confidence. Wakefield's 1998 paper stated: *"we did not prove an association between measles, mumps and rubella vaccine and the syndrome described. Virology studies are underway that may help to resolve this issue*" (quoted in Cox, 2010. p.158). This story was not about scientific knowledge but about how confident people felt regarding their information. Effective knowledge management must take into consideration the confidence that results from information, data and practice. This will ultimately enhance the knowledge outcomes, which is the essence of this thesis.

The recent story of Sir Roy Meadow explained the links between knowledge and confidence (Gooderham, 2008). Meadow was a highly influential British medical expert on child abuse and was credited with saving many children by uncovering the basis of harm to children (Horton, 2005; Speight, 2006). He was President of the British Paediatric Association and later President of the Royal College of Paediatrics and Child Health.[38]

Given his expertise and reputation, it was natural for him to be asked to give expert evidence in court in difficult cases of suspected child harm. He provided expert evidence during the trials of Sally Clark, Angela Cannings, Donna Anthony and many others. These three women were convicted of killing more than one of their children. In his evidence

[38] Sir Roy Meadow's life and the legal issues he raised were described in the press; see BBC website http://news.bbc.co.uk/1/hi/health/4432273.stm].

during Mrs Clark's trial, Meadow stated that the odds of two children in such an affluent family dying of natural causes were one in 73 million; therefore, Mrs Clark's children were murdered.[39] As a result of his testimony, Donna Anthony was also convicted of murdering her son and daughter by smothering them. He claimed that the chance of both of these two children dying of cot death was one in a million. These three women, as well as many others, were convicted of murder, but later exonerated by the Court of Appeal and freed after spending lengthy periods in prison.[40]

Meadow's evidence was challenged by the Royal Statistical Society (not his peers), who explained that there was no statistical basis for Meadow's figure of one in 73 million and, moreover, his assessment was influenced by thinking fallacies and the ignoring of the fact that infant deaths within the same family were not statistically independent (Watkins, 2000). The probability of a further cot death within a family is higher than the group average, and has been estimated at 1:100-200. Meadow pursued circular arguments and ignored natural causes as a possibility (Le Fanu, 2005a; Le Fanu, 2005b; Carpenter *et al.*, 2005) The Appeal Court heavily criticised Meadow's evidence during the original trials and he was struck off the medical register by the General Medical Council. This series of cases of miscarriages of justice led to significant harm to these women and their families.

Sir Roy Meadow was not thought to be driven by malice (Bishop, 2005; Horton, 2005). His evidence reflected his genuine beliefs but obviously not the 'truth'. He was very confident in providing misleading statistics that led to the wrongful conviction of innocent women. He thought that he knew what he did not in fact know. Is this a problem of 'knowledge', or of misplaced and unjustified confidence? Had Meadow had a suitable level of doubt (i.e. less confidence) in the information around him as well as an appropriate level of confidence in his own personal experience in the subject, he would have considered other options; i.e., natural causes of infant death, and questioned his views including his unreasonable statistical conclusions. The issue here seems to be overconfidence, which led to the inappropriate use of knowledge sources, by overestimating or underestimating the credibility or accuracy of such sources. I argue that this knowledge problem requires better confidence management.

[39] See press coverage in the Guardian 13 October 1999, page 5 by Paul Kelso, and the Observer 10 November 1999, page 2 by Paul Kelso.
[40] R v. Clark [2003] EWCA Crim 1020; R v. Cannings [2004] EWCA Crim 1 and R v. Anthony [2005] EWCA Crim 952.

The emergent theory from this research provides further explanations for Meadow's case. There were particularly weak peers around him[41] and several factors may have led to this; his prominence in the field, the extremely prestigious positions he held and the awards he received made him very difficult to challenge. His overconfidence probably contributed towards intimidating others. These factors led to the absence of adequate challenges to Meadow, challenges that would have kept his confidence in check and thus have appropriately managed his knowledge. It has been argued that the General Medical Council review (and punishment) of Meadow represent a peer assessment of his practice (Bishop, 2005), albeit this was too late.

Meadow's story is an extreme one. However, it explains how the unskilled and unaware can build a misleading confidence in their knowledge that can prove harmful. Being overconfident in making a difficult diagnosis or insisting on a particular baseless modality of therapy (e.g., Wakefield and his colleagues) or failing to consult with colleagues (e.g., the paediatric neurologist) when appropriate are knowledge management issues for doctors. These can be managed through systematic engagement with others and accessing quick feedback on patients' outcomes. A proposed knowledge management tool through the continuous adjustment of confidence for NHS staff is presented in Chapter 7. The next section examines a different knowledge-based problem facing the NHS.

### 6.6 NHS knowledge challenges: the need for development

If we accept that information or skills need to be accepted and verified by the group before a knowledge worker can feel confident in their use (the conclusion of this research, see Chapter 5), we risk a situation where the same knowledge continues to circulate most of the time within the team. In such a situation, the members of the group continue supporting each other to reinforce the existing ideas, avoiding the pain associated with change and confrontation of deeply-rooted beliefs. There are many existing academic theories which support the emergence of such a situation, and in so doing these theories provide support for the emergent theory of this research. These theories include the concepts of groupthink and communities of practice, as well as the work of Thomas S. Kuhn. Victoria Medvec of Kellogg Business School states:

[41] He was challenged by lawyers in the High Court because of his victims' resilience, not by his peers. However, medical colleagues and the Royal Statistical Society joined in after his credibility was questioned and confidence in his abilities was damaged.

"*When people sit down together, there is a tendency to seek confirmation of what everyone already knows*" (http://www.economist.com/node/5380422).

One of the major knowledge management problems currently facing the NHS is the timely, effective introduction of new knowledge into practice. Undesirable delays can be catastrophic. However, it has been estimated that a period of 17 years is usually required to move scientific discoveries into medical practice (Munro et al., 2016; Morris et al., 2011; Hanney et al., 2015). This is quite a long time for desperate patients and their families. Some of this time is spent conducting further trials and obtaining licences from regulators. Time is also required for the professional community to assess the evidence (Munro et al., 2016), mainly to build sufficient confidence in the usefulness of the new therapeutic modality. However, delays may occur due to knowledge management issues, particularly in relation to closed professional groups, who resist change and build strong confidence in what they do in a groupthink style.

Within the NHS, the contaminated blood scandal (Wise, 2015) is an example of the harmful effects of closed communities of practice and their associated group-think. In the 1970s and 80s, transfusion doctors were a small group of highly specialised staff who worked comfortably together within a closed community. They were insufficiently critical of their practices and were slow in adopting new developments or reacting to emergent risks in transfusion medicine. They continued to obtain blood from high risk donors for longer than was optimal and failed to introduce new tests to check for harmful viruses as soon as such tests were available (Wise, 2015). This led to the preventable transmission of viral infections, including AIDS and hepatitis, to thousands of patients, many of whom lost their life as a result. This is not a new problem for healthcare services. It has deep roots in the history of medicine.

Dr Ignaz Philipp Semmelweis (1818-1865) was a physician at Vienna General Hospital who failed to convince his obstetric colleagues to wash their hands in order to reduce the incidence of puerperal fever, which used to be a fatal complication following childbirth. His views were met with disbelief and criticism. Only after his death did the medical community realise the benefits of aseptic techniques. The early adoption of Semmelweis' idea would have saved many lives (Reid, 1975). Strong peer influence can lead to cohesive teams, which may result in communities of practice where experts work together to develop, maintain and use knowledge. However, the influence of peers can be damaging and lead to a closed mental circle of groupthink. These two concepts are discussed below.

Managing communities of practice (discussed in section 2.7) has proven to be difficult, if not impossible. This is because the strength of such communities is based on their spontaneous nature and reliant on the social connections between the members. Any formal or structured interference from the management would be likely to lead to members' disengagement and result in the cessation of such communities' existence (Anand *et al.*, 2007; Thompson 2005). However, communities of practice could be supported by allowing a suitable culture, releasing enough staff time for this work, and encouraging social interactions. Ironically the best way to manage communities of practice is to provide them with adequate autonomy to manage themselves (Hislop, 2018, p. 205). The emergent theory of this research provides an understanding of the mechanisms of communities of practice. The view that knowledge is confidence in what we know or what we do, obtained through the approval of our peers, would explain how socially connected members of staff, over a period of time, start to share confidence, which allows them to make better decisions and adopt more sophisticated practices. This also explains why any management interference could easily damage a process as thin and sensitive as confidence building. The emergent theory provides an understanding of how these communities work.

The concept of communities of practice is not always positive or constructive, and this brings the discussion back to issues around excessively strong or weak peers. The *"unequal relations of power"* (Lave and Wenger, 1991, p.42) between members can be problematic, with some members, probably the 'old-timers', having more influence than newcomers, for example. This power conflict means that *"communities of practice are as likely to resist as support change"* (Hislop, 2013, p.165); i.e., these communities could develop new confidence and build advanced knowledge, but also intentionally prevent such development. A strong sense of identity may lead the members to ignore ideas from outside their community and regarding them as irrelevant (Alvesson, 2000; Baumard, 1999). Some inward-looking communities are unreceptive to new knowledge (Brown and Duguid, 1998), which causes circular knowledge to replace the process of the advanced search for new ideas, ultimately leading to a loss of innovation (Leonard and Sensiper, 1998). In such circumstances, communities lose the ability to unlearn and fail to innovate, change or adapt, and so their practice and decision-making soon become outdated (Hislop, 2013). The emergent theory provides a framework, based on confidence, for understanding these problems. The mutual support between the members will build unjustified confidence. This view leads to another related, well-known concept of groupthink.

Groupthink is *"a mode of thinking in a cohesive in-group, in which members' strivings for unanimity override their motivation to appraise realistically the alternative courses of action"* (Buchanan and Huczynski, 2010, p. 644). Irving Lester Janis first used the term after studying several failed American projects, mainly in foreign policy (Janis, 1982). Janis' point is that extreme cohesiveness may prohibit the individuals within the group from challenging views, disagreeing with decisions or even volunteering ideas, because their focus is on maintaining a group consensus. Expert opinions which do not support the agreed views are quickly dismissed after a short, usually biased and selective, evaluation. Such team dynamics tend to lead to swift agreement with the majority view (based or the decision of a directive leader, see below). The group is likely to make a poor decision. Janis (1982) suggested some symptoms of groupthink, such as the illusion of invulnerability, collective rationalisation, morality and shared stereotypes. Moreover, the members of the group may act as 'mind guards' to defend the team against outside information which threatens the group consensus.

A team is likely to strive for cohesiveness if it is small, has been established for a long period of time, is isolated and exposed to external threats, if it is difficult for others to gain entry to the group and if cohesiveness is rewarded, materialistically or morally (Buchanan and Huczynski, 2010). Whilst cohesiveness was found to lead to a predisposition towards groupthink (Mullen *et al.*, 1994), the presence of a directive leader is another risk factor, as a strong, opinionated leader could influence the group in one direction (McCauley, 1989).

Given the large number of medical staff working in different specialities in hundreds of hospitals across a country such as the UK, some groups of doctors will fulfil these criteria at some stage in their life and so become vulnerable to groupthink. Being knowledge workers, whose main role is to make knowledge-based decisions about patients' care, groupthink is a threat that they could bring to healthcare services and, in such circumstances, groupthink is clearly relevant to knowledge management. Although groupthink is a well-known concept in general psychology, in the organisational behaviour literature, group dynamics and group decision-making texts, interestingly, groupthink is not usually discussed in the knowledge management literature and the concept is not usually seen as relevant to knowledge management. Knowledge management textbooks, such as Hislop (2013), Dalkir (2011) and Orr *et al*. (2016), do not include groupthink in their table of contents or subject index. Groupthink supports the idea of circular knowledge (discussed in Chapter 5) and explains the issues with peer influence as one of the main categories of

the emergent theory of this research. The understanding of knowledge as provided by the emergent theory links knowledge management with other disciplines and provides a flexible meaning of knowledge with better explanatory power of the term that is applicable to all such disciplines.

The above discussion linked knowledge with confidence. Losing confidence is a painful experience that could explain why changing or updating existing knowledge can be emotionally hard. On the other hand, building new knowledge can be a positive experience due to improved overall confidence. This means that it is important to get it right first time and avoid the development of bad habits. Also, one needs to be emotionally aware when managing knowledge. The damaging cycles of closed communities of practice or group-think can be managed by adopting a systematic approach to development; i.e., the regular introduction of research findings into practice through organised engagement with the external world by appropriate benchmarking and facilitating attendance at credible conferences to allow meaningful feedback (see the next chapter).

### 6.7 Confidence Management and Ramsey's provocative approach:

According to the research findings (Chapter 5), the management of staff confidence can be achieved by feedback from both practice and peer input. A tool based on these findings is discussed in Chapter 7. However, there is a need to activate the whole process and ensure the swift movement of knowledge from the starting point of being motivated to the end point of being confident. Maintaining a dynamic knowledge circle and avoiding stagnation is important and the provocative approach to learning may help in achieving this. The provocative approach to learning was particularly considered because most of the requirements for such an approach already existed within the NHS. Ramsey's approach is now explained and utilised to construct the management tool, as described in Chapter 7.

Ramsey (2008), being aware of the critiques of the conventional teaching of management courses, developed a different approach[42] that is based on a provocative pedagogy within classroom's relations, that are "*polyphonic, socially constructed and negotiated*" (Ramsey, 2008, p.544). Ramsey developed this approach following several ethno-experiments (Ramey, 2007) in which people engaged with interplay that allowed them to explore their

[42] An approach that is different to explanation and sense-making.

relationship within their group as well as those with the discussed idea, become conscious of how they develop new actions and, more importantly, be provoked by the idea, whether this be teaching materials or a management problem. Ramsey provided examples of managers who were inspired by the literature to generate new approaches to their management problems (Ramsey, 2011) and became aware of relationships that can influence actions, whether this is a subject-object or a subject-subject relationship. The provocative approach was used to inform the management tool proposed in this thesis for the following three reasons.

*Firstly*, the required conditions for successful provocative knowledge management are already present within the NHS. As explained in the findings chapter, the peer influence that shapes the confidence of medical staff in their knowledge, takes place during meetings (MDTs), ward-rounds, conferences, small consultation groups and sometimes over the net. These venues can be considered classrooms for learning knowledge (or building confidence). However, important differences exist. There is no formal tutor (or teacher), although louder voices or creditable experts may occupy more space and time in the discussion (the learning process). Also, being peer discussions, there is some sense of equality and one may not feel passive or merely receptive to others' views, although such situations may arise in dysfunctional teams (see Chapter 6). Medics, as experts, come to these discussions with their own influence as well. The other difference is that discussions in these venues are unlikely to bring new knowledge material to the attention of the medical staff, as the doctors would have had to have read about such pieces of knowledge previously in journal articles or have heard about them during a lecture. Discussions will allow them to become confident about a particular practice or particular piece of information, be this a new treatment, new diagnostic method, etc. Ramsey (2008) described how all of these differences from the classical classroom teaching, already existing within the NHS, need to be developed in the field of business management education (usually MBA courses) for successful provocative learning. Ramsey (2008) explained how people's relationships (peer influence in this research) need to be "polyphonic socially constructed and negotiated" (p.544).

*Secondly*, the steps to implement provocative KM are also consistent with doctors' interactions with knowledge sources. What the provocative approach adds is a focus on

the provocative nature of medical information,[43] an important point that is sometimes ignored in the traditional knowledge management approaches. In developing new insights into management teaching, Ramsey (2008, p.546) proposed the use of three points to develop a provocative classroom: firstly, the learner is an autonomous sense-maker who creates his/her own knowledge. This largely applies to the interviewed medical staff in this research. Despite their reliance on peer influence, the interviewed staff were independent organisers of their affairs, who followed a knowledge process that was influenced and sometimes designed by themselves. Secondly (Ramsey continues), the academic content of knowledge should be provocative and again this is exactly what medicine is now. The speed of change within medical practice, the need to get it right first time and the variation between patients' clinical needs make the application of medical educational materials (sources of knowledge) highly challenging and provocative. This should be emphasised as an advantage rather than a shortfall of the knowledge process. Finally, Ramsey explains that the practice (of managers attending an MBA course) is a changing product within dynamic ongoing dialogic relationships. This reflects the continuous, changing nature of the knowledge process and the resulting confidence, as explained in section 4 of chapter 5.

*Thirdly*, this approach ensures a continuous, challenging and dynamic knowledge process that generates new insights because the focus will be on practice (Ramsey, 2011, p.470). This is because knowledge is never seen as a finished product but, rather, a developing, changing idea. This will ensure the continuous development of knowledge. How doctors learn is not a classical classroom-based process but a provocative changing confidence building process that is closer to Ramsey's concept of the polyphonic prevocational classroom, where education (knowledge acquisition) is based on actively contributing learners, who see the educational materials as a source of provocation and engage in a social dynamic and changing process. The benefits of such an approach (Ramsey explains, 2008, p.556) are that: firstly, innovation becomes the focus rather than cognitive processes and this should improve the outcomes of learning; i.e., the solutions to patients' medical problems. Secondly, knowledge sources are assessed according to their

[43] As discussed in Chapter 2, medical information is rapidly changing and usually provisional in nature. Absolute truth is not a feature of medical knowledge. Moreover, the application of a piece of information to match the clinical needs requires careful deliberation. This makes medical information provocative in nature.

provocative capacity to improve practice rather than their accuracy (see the discussion about truth in medical practice, Chapter 6). Finally, a provocative learning approach will ensure that the power of a teacher (or within the NHS, a particularly influential member of staff with more expertise or a louder voice) is controlled by the sharing of influence, and such a person could play a more supportive or facilitator role (Ramsey 2008, p.556). What is of special interest to me regarding the concept of provocation is that it is linguistically linked to human emotion.[44] Although Ramsey and other related authors (Farrelly and Brandsma, 1974, Bakhtim, 1984, Dewey, 1938, Shotter, 2000) did not make an explicit reference to confidence, the use of provocation implies an emotional dimension to the process. This resonates well with the outcomes of this thesis, where the focus was on the emotional component of knowledge (confidence).

## 6.8 Conclusion:

This chapter has positioned the research findings within what is known about knowledge and confidence. The overall argument in this chapter is that the confidence idea does overlap with many existing views within the philosophy, psychology, learning and social interaction disciplines. However, none of these views have actually considered confidence as an integral part of knowledge, although Bandura came very close doing so. My findings can explain the underlying mechanisms of many of these views; i.e., the research findings have good explanatory power and this is what is needed from a theory. Aristotle's phronesis described a type of knowledge that develops over time with experience and is not related to scientific knowledge. Williamson argued that knowledge is a state of mind. Both philosophers' views can be understood as a process of building confidence in what we know. The idea that knowledge is not necessarily an absolute truth helps us to engage with the rapidly changing medical knowledge and allow the meaningful management of knowledge as emotion. The importance of practice in building confidence, as shown in this research, resonates well with the practice-based perspective of knowledge. The findings of this research provide an explanation of how the practice-based perspective actually works. Bandura's views on learning came close to the concept of confidence, by proposing self-efficacy as a tool for pursuing further knowledge and enhancing performance. The Asch experiment was reviewed to show that those around us are critical to our decision-

[44] The Cambridge Dictionary defines provocation as an action or statement that is intended to make someone angry.

making process, including our knowledge-based actions. Two knowledge management challenges that are facing the NHS were discussed; these are harmful doctors and the need to introduce the required development in a timely manner in order to avoid engaging in outdated practice. Kruger and Dunning's concept of the 'unskilled and unaware' was used to discuss the first problem and the theory obtained from this research was used to link this concept to confidence. Utilising up-to-date knowledge is critical to healthcare services and this can be hampered by closed communities-of-practice and the possible emergence of group-think. This reflects the undesirable effects of a situation in which the staff mutually support each other in order to build confidence (or knowledge) without embracing the new developments in the medical field. The explanatory power of the theory will be used to design a tool that will help to manage knowledge within the NHS. This tool is presented in the next chapter and is based on two principles: feedback and provocation.

# Chapter 7
# Conclusions, recommendations and reflections

## 7.1 Thesis Conclusions:

The objective of this thesis was to explore the meanings of knowledge as understood by senior medical consultants in the NHS. Such understandings should allow the better management of medical knowledge to the benefit of patients (Chapter 2). The constructed theory from this research, with its main six themes, has provided a new understanding of the concept of knowledge (Chapter 5), which understanding has allowed the design of a new model for managing knowledge (see below). The contribution of this thesis to existing knowledge is explained in this section. The constructed theory from this research described a knowledge process during which medics, once motivated to pursue knowledge about a particular topic, engage with sources of knowledge such as books, journal articles, conference lectures, etc. However, the information and skills obtained from these sources become knowledge only after doctors develop sufficient confidence in the accuracy of these sources and in how the information and skills can be used. Without such confidence, doctors will only be aware of such sources but do not necessarily know them. Confidence is built through two main routes: firstly, feedback obtained from practising different skills (e.g., the outcomes of a surgical operation) and, secondly, feedback from peers regarding how reliable and useful the information is. This process is continuous, dynamic and changing, during which confidence is constantly adjusted. The contribution of this thesis to theoretical knowledge is based on uncovering the emotional component of medical knowledge, which is confidence. The emergent theory, from this thesis, argues that our confidence, in the information we have and skills we develop, is an integral and highly significant component of our knowledge. One knows something or knows how to do something if one thinks *confidently* that one knows it or knows how to do it. Someone who understands a subject very well or has the ability to complete a task successfully but lacks confidence simply does not know that subject. An unconfident doctor does not know medicine, regardless of his/her awareness of the scientific facts and medical advances.

This concept of knowledge, which includes a strong emotional component, is different from the current understanding of knowledge as either objective information and data that require processing by our cognitive ability (Hislop et al., 2018, Chapter 2) or as human behaviour that influences practice (Hislop et al., 2018, Chapter 3). According to the

emergent theory, knowledge is not necessarily only a logical mental process or purposeful human behaviour; rather, it also contains a fallible emotion which is, in this setting, harder to measure, observe and control. Based on this new view of knowledge, this thesis proposed a tool for managing knowledge in the NHS (see below).

Peers influence our knowledge. Colleagues can direct us to important publications, tell us about their experience or directly teach us. However, this thesis adds a new point. The agreement of peers and their approval of different pieces of information is critical to our confidence and hence can build or destroy our knowledge. Interaction with colleagues becomes an important step in the knowledge cycle, even if such colleagues do not directly provide us with information or teach us. Equally important is practising skills to build knowledge. Although training doctors by organised practice, e.g., surgical training programmes, is routine and thought to develop skilled doctors, this thesis makes a different point. This thesis emphasised the feedback from such training and the ability of such feedback to build confidence. In this sense, an extensive training programme that provides unstructured or patchy feedback, or one that does not test or measure the resulting confidence, is of little use. The interviewees in this research explained that the confidence they gained through passing an exam is critical to their knowledge process, despite the fact that their factual knowledge did not change dramatically following the exam.

This thesis makes another contribution to the knowledge management literature by emphasising the potential negative characteristics and damaging outcomes of certain types of knowledge.[45] This insight helps us to understand some of the most common and significant knowledge-related problems existing within the NHS. People can be overconfident or have completely unjustified, misplaced confidence in situations where they lack understanding or ability. According to the emergent theory, they are still practically knowledgeable, albeit in a wrong or negative way. This is because our knowledge consists of two parts: firstly, objective information and skills and, secondly, the emotional part in the form of confidence. Three scenarios can explain the interactions between these knowledge components:

[45] Knowledge problems, such as information overload and excessive knowledge that gets in the way of new learning, etc., have been explored in the literature (Hislop et al., 2018, Dalkir et al., 2017) but the concept of wrong or incorrect knowledge was felt to be contradictory, as knowledge is always right (Williamson, 2000) or even a virtue (Aristotle, 2004).

- **The desirable scenario**: adequate amounts and the correct types of information and skills as well as the appropriate dose of confidence: this leads to good outcomes, as doctors will deliver a service that is based on correct information but within the limitations of their capabilities.
- **The ineffective scenario**: adequate amounts and the correct types of information and skills but no confidence to support what one knows: this leads to no outcomes, as the person will be unable to use what he/she knows. A lack of confidence is incapacitating.
- **The dangerous scenario**: a lack of adequate amounts and the correct types of information and skills but inappropriate confidence in what one thinks one knows: doctors will confidently use incomplete or incorrect information with very damaging outcomes

The findings of this research have shown that the process of gaining confidence in available information so that it can be used is not perfect, can go wrong and can cause harm. This introduced a negative (and unusual) meaning of knowledge. However, such a negative meaning of knowledge is helpful in understanding some of the common knowledge-based problems facing the NHS (Chapter 6). The flow of knowledge (or confidence) within teams can go wrong (Chapter 6). Inappropriately strong/weak peers can build undesirable types of confidence; i.e., the wrong knowledge. Strong peer influence can lead to closed teams with circular out-dated knowledge, whereas weak peers can lead to the emergence of harmful, unaware and unstoppable 'experts' (Chapter 6).

Another important contribution of this thesis to current knowledge is that the constructed theory provides different, sometimes deeper and more plausible explanations of the existing literature (Chapter 6). Our knowledge of various topics is gained or lost depending on the movement of these topics into or outside the limits of our confidence. Although it is intuitive to think that knowledgeable people are confident, direct or indirect references to confidence as part of our knowledge have not been addressed, discussed or researched in the knowledge management literature and confidence is not included or indexed in the major knowledge management textbooks (e.g., Hislop et al., 2018, Dalkir et al., 2017). However, Bandura's (1997, 2001, 2002) concept of self-efficacy, Asch's (1951) paradigm on conformance, Janis' (1982) work on group-think, and Williamson's (2000) view of knowledge as a state of mind, came close to the conclusions of this thesis. This body of

literature was discussed in Chapter 6, where I showed that the emergent theory not only has many links (some are strong links with existing concepts in psychology, philosophy and sociology) but also takes the thinking in these fields a step further by arguing that confidence is an integral part of knowledge.

The constructed theory from this project provides different and, at times, more persuasive explanations of the existing concepts and allows clearer thinking around how knowledge should be managed. Bandura (1997, 2001, 2002) thought that self-efficacy (his way of describing confidence) is important because confident people will work harder to achieve better learning. He did not think confidence is part of knowledge, although practically his argument points this way. Asch (1951) was researching conformity. However, many of his research participants were managing their knowledge rather than trying to conform (see Chapter 6). Janis' (1982) concept of group-think explains that people support each other to build a coherent team and this coherence is usually knowledge-based. Group-think explains some of the NHS' knowledge problems (see Chapter 6). However, group-think is a concept that is hardly discussed or debated in the current knowledge management literature. Williamson (2000) argued that knowledge is a state of mind. Equally, I argue that confidence is a state of mind and so this thesis brings hard line philosophy a step closer to practical knowledge management for the first time, as the basic philosophical concepts on knowledge are hardly used in the contemporary knowledge management literature (e.g., Hislop et al., 2018, Dalkir et al., 2017). The constructed theory from this research has shown a reasonable explanatory power not only regarding the findings of this research but also regarding the existing thinking in the literature and completed psychological experiments. A good theory aims for explanation and understanding, and offers accounts of what happens (Charmaz, 2014, p. 228). This constructed theory meets this goal.

On the theoretical ground, the coding of interviews in this research and the constructed theory have provided answers to the research question regarding the meanings of knowledge as well as provided alternative explanations to many of the concepts found in the literature. Practically, the research findings and the theory can be used to construct a model to manage knowledge. The next section proposes a tool for the management of knowledge within the NHS, based on two loops that aim to adjust peer interactions and clinical practice to ensure appropriate confidence and, hence, effective knowledge.

Currently, healthcare services manage knowledge mainly by providing access to publications, guidelines and attendance at conferences to build the objective component of knowledge. According to this thesis, the process of knowledge management should also aim to build staff confidence and ensure the justification of and good bases for such a feeling (confidence), as well as continuously managing the notions of overconfidence or misplaced confidence. Current examples of NHS knowledge management problems can be understood in the light of the outcomes of this research (see Chapter 6). Based on this theoretical background, this thesis provides a different approach to knowledge management which focuses on better confidence management. A knowledge management tool, described in the next section, shows how the staff's interactions with the sources of knowledge can be managed alongside the continuous monitoring and adjustment of their confidence using feedback in a continuous circle that is kept moving by provocation to boost staff interest.

Confidence building can be achieved by practising skills and or interacting with appropriately informed peers. Facilitating constructive interactions between professionals with different and varied types of skills is a good way to create and disseminate knowledge within an organization. Libraries and IT systems provide the information required, but cannot build the required confidence and hence do not take the process of knowledge building to its final stages. Moreover, there should be a healthy environment to challenge and update previously-held concepts and points of view.

The outcomes of this research have addressed the research question by providing a new concept of knowledge that is grounded in data and practically useful. The outcomes of this thesis help to address the problems caused by a lack of consistency and a lack of an agreed definition of knowledge that led the field of knowledge management to struggle to achieve academic creditability and be practically useful (Chapter 2). Most NHS Trusts have educational and training departments but knowledge management departments are rare. This thesis provided a concept that could be encompassing and so leads to the better management of knowledge. Such a concept can be used to explain knowledge-based problems in a different light and so we can think about alternative modalities to solve such problems. The new concept of knowledge opens the door to future research that may further define such confidence, its contexts and factors that positively or negatively control it.

The use of grounded theory in this project was helpful for two reasons. Firstly, the line-by-line coding ensured that all of the views expressed by the participants were captured. This allowed the concept of confidence to emerge. Secondly, linking the themes into a theory provided a conclusion and an answer to the meaning of knowledge. The next section describes a knowledge management tool based on the findings of this research.

### 7.2 A confidence-based tool for knowledge management in the NHS:

This section utilises the findings of this thesis to design a confidence-based tool for NHS managers to use in practice. The tool utilises activities that already exist within the NHS. The tool organises such activities in sequential steps and explains their importance. It is based on two principles: firstly, the provision of timely, effective feedback loops (using practice and peer input) to adjust staff confidence as they absorb information and acquires skills; and, secondly, the adoption of Ramsey's (2007, 2008, 2011) provocative pedagogy so that the loops remain dynamic. These two concepts are discussed below, and Figure 7.1 provides an overview of the tool. Examples from the field of bone marrow transplantation[46] are given to explain some of the practical implications of this design.

#### Feedback loops for managing confidence:

Considering the findings of this research (Chapter 5), interactions with peers and effective medical practice are the most direct activities that provide feedback which influences our confidence in the information we hold and the skills we possess. Such feedback is used to construct two loops to develop and monitor appropriate confidence. Such feedback should be both continuous and of a high standard. A practical way of measuring knowledge outcomes in healthcare is by measuring patient outcomes. As demonstrated in Figure 7.1, the tool starts with the apprenticeship stage and this is followed by two parallel loops: one uses feedback from practice and the other relies on peers' feedback. These stages are explained below.

**The apprenticeship stage** is the starting point for a doctor's training. It covers the basic medical training at medical school as well as the well-structured postgraduate training programmes. This stage involves plenty of hands-on practice and feedback from tutors. Managing knowledge at this stage in a doctor's life is less problematic. Transplant doctors

[46] Bone marrow transplantation is my field of medical practice and I claim knowledge or awareness of the training issues within this discipline.

must complete a residency programme within a transplant unit over several years in order to acquire the knowledge, master the skills and build their confidence. Doctors will be directed on what to read and what to do by their tutors and this satisfies their need for feedback. More mature doctors may need to undergo such apprenticeships at later stages when they subspecialise, change specialty, or introduce new types of practice. For example, more experienced transplanters may join an advanced transplant unit for a period of time to learn about the new types of transplantation. Following the completion of such structured training, doctors need to maintain their knowledge by engaging in two types of loops of knowledge management: the practice-based and the peer interaction loops. Although junior doctors cannot skip this stage, the current NHS systems are not robust enough to ensure that more mature medics undergo such structured training when they need it. Hence, it is included in this tool to emphasise its importance.

**Practice loop:**

Following the apprenticeship stage, doctors become independent practitioners. They continue to practise (Figure 7.1) and this loop aims to ensure that appropriate feedback from their practice is provided to them. Their practice is monitored directly by their patients' outcomes (e.g., surgical success rates, cancer survival rates, etc.). These outcomes must be continuously audited. The results of such audits are made available in good time to the medical staff as a tool for adjusting their confidence. Audit results should be benchmarked against outcomes from elsewhere, nationally and internationally, to ensure that a desirable tension is always exerted on the confidence that doctors feel regarding their practice. Unexpected inferior outcomes will trigger confidence concerns which will motivate the staff to search for sources of knowledge, practice more, seek peers' advice and, ultimately, improve their practice. For transplant units, the British Society of Blood and Marrow Transplantation[47] obtains outcome data on every transplant carried out in the UK (active auditing) and, at the end of the year, a report is sent to each unit explaining their outcomes in relation to the national performance (benchmarking). This system is ideal and fits well with the design of this knowledge tool. However, two issues are of note. Firstly, this model is designed for governance, not knowledge management. Secondly, this system hardly exists outside the transplantation field. A better understanding of the confidence component of knowledge will strongly link governance to knowledge and help to roll out

[47] www.bsbmt.org

this system to other areas of healthcare. According to this tool, access to a minimum amount of practice should be a requirement for a doctor to be considered skilled in any area of work. Rare disorders need to be centralised in units that allow reasonable degrees of practice to maintain competence.

**Peer interaction loop:**

Alongside feedback from practice, medics are engaged in active interactions with their peers. Such interactions should be organised and not left to chance. Regular team meetings should be in place. Holding multidisciplinary meetings is a good way to accommodate peer interaction. The staff need to be trained on how to engage with their peers and how to manage conflict and disagreements so that the groups are not closed and inward looking, nor hijacked by an unduly strong, loud voices. The outcomes of patients should be assessed according to the development in the field. The term ‘development; here is used to mean the implementation of high quality, mature research findings. A system must be in place to ensure that developments in the field are always fed in a timely manner to the MDT. Development requires the importation of sources of knowledge from outside, particularly from credible conferences. Attendance at conferences must be planned and organised by the knowledge managers, to ensure that the input is systematically fed back to the team, implemented, and monitored and that the patient outcomes are audited. Knowledge managers should help to organise such meetings, set the agendas and ensure a minimum amount of attendance. Currently, transplant units discuss patients’ treatment at regular team meetings. However, the importation and implementation of advanced research findings are not necessarily monitored and so largely depend on the enthusiasm of the staff.

The steps described in this tool are already working within the NHS albeit in a limited scale and far from being organised. There is some centralisation of rare diseases in specialised units, MDT initiatives have been introduced for many years, the outcomes, for some disorders, are measured and there is an audit department in almost every Trust. NICE is an organisation that has been established to introduce development into the NHS (see section 2.3). Moreover, doctors are always keen to attend and contribute to conferences. This is why the NHS is reasonably functioning and knowledge seems to be flowing within different parts of this massive organisation. However, all of the current activities are insufficient for appropriate knowledge management; hence the need for this tool. The

current activities in the NHS suffer from several shortfalls. These include: firstly, apprenticeships are not always considered for senior staff embarking on a new practice or introducing new services. Secondly, most of these initiatives are voluntary, uneven, infrequent, not measured, unmonitored and unrelated to patients' outcomes systematically and continuously in a way that allows constructive feedback to be given to staff so that they can manage their confidence. It is hard to find a sector within the NHS that has all of these steps, as described in the loops, active and functioning. Although the marrow transplantation community is relatively advanced, there remain many gaps. For example, the attendance at conference is highly dependent on individual doctors' enthusiasm and the available funds. Thirdly, many of the steps in the tools are used in current practice as governance tools, which can intimidate and disengage the staff. There is a need for steps such as auditing to be seen as learning activities. Shortfalls that are thought to be related to knowledge management can be linked to a failure in one or more of the steps in this tool. A lack of patients' outcome data and the absence of constructive MDT leads to unskilled staff to continue to be unaware. Inattention to external input from conferences and benchmarking against other healthcare services lead to closed communities of practices and the continuation of outdated practices.

The tool focuses on doctors' knowledge and its management. This reflects the research sample, which included only medics. At this stage, it would be hard to extrapolate research findings to other groups of staff without further research and exploration of this theory within other groups (see the recommendations for future research below). Moreover, medical knowledge is an important, significant component of any healthcare service and shortfalls in such knowledge have caused more patients harm than the knowledge of other groups of staff. Managing medical knowledge well is an important endeavour. However, this should not undermine the contribution of other groups of staff, such as nurses, pharmacists, radiographers, etc., and their knowledge requires equal attention.

The implementation of this tool requires attention to be paid to two possible but significant obstacles. *Firstly*, there is the cost implication of the data collection, audit resources, hosting regular meetings, conference attendance, etc. Examining knowledge management in this way can expose the funding gaps that the NHS currently faces in managing one of its most important assets: knowledge. However, given the high cost of failures, including the cost of litigation, a business case of a robust knowledge management programme can

be made. *Secondly*, audit projects and benchmarking initiatives have been used to assess performance rather than to help knowledge. The strict monitoring of performance, outcomes and audit data can seem intimidating to the staff. The pressure to change to meet these new developments can seem challenging and disruptive. The theory of this research emphasised the social nature of knowledge and so these factors need to be managed sensitively to allow the emergence of a new, more helpful understanding of the concepts of audit, benchmarking, and outcomes measurements. These activities should be seen as supportive knowledge enablers, not only hard performance measurements. Moreover, the feedback loops must be dynamic to ensure staff engagement in order to adopt change in a timely manner and this can be facilitated by the provocative approach to learning, described below.

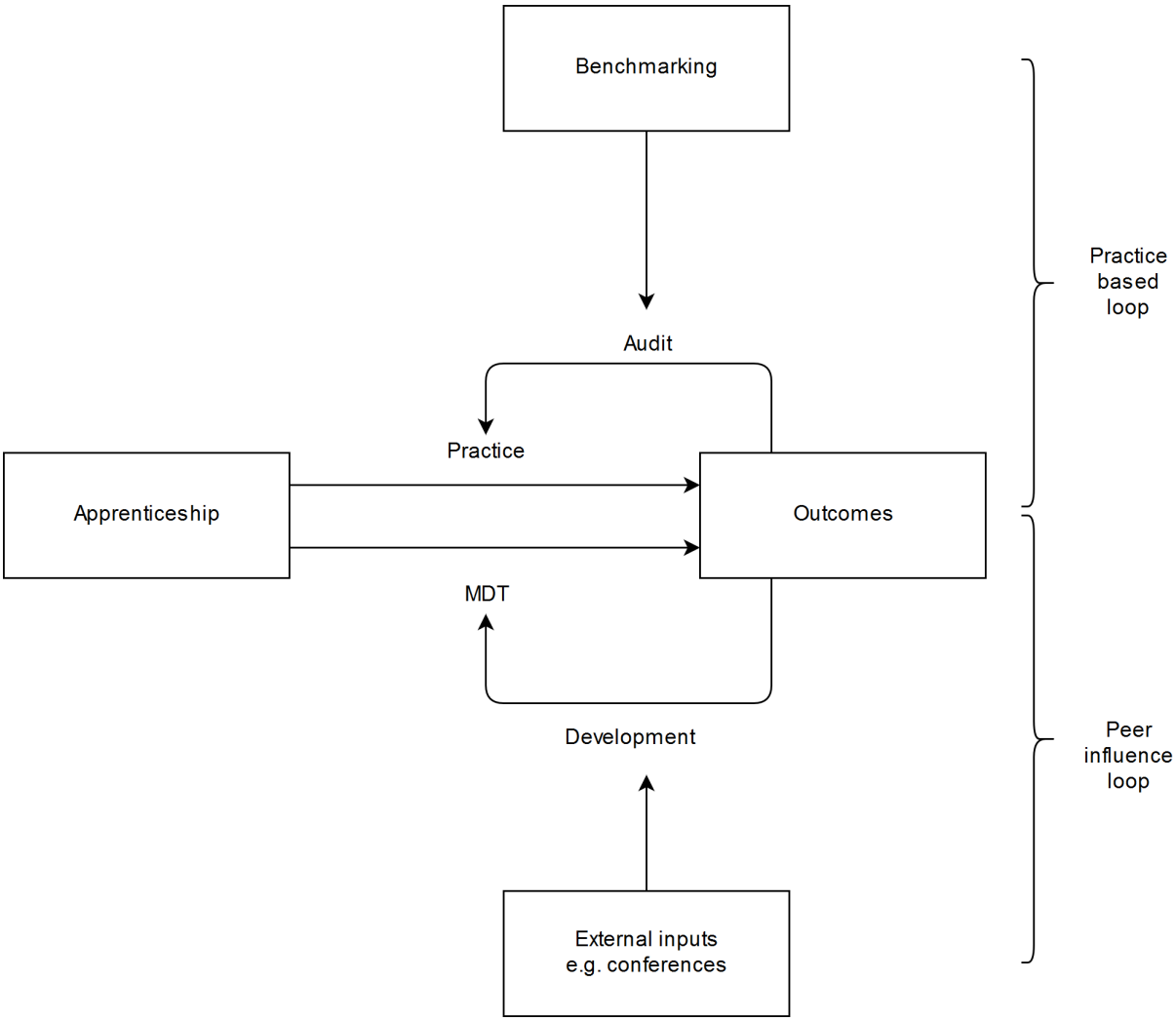



Figure 7.1: A confidence-based tool to manage knowledge

**Ramsey's provocative approach:**

The flow of knowledge and associated confidence within the loops described above require a supply of energy to maintain momentum and avoid stagnation. The staff need enthusiasm to respond to auditing and benchmarking reports as well as the required interest to attend conferences and engage with their colleagues. The provocative approach to learning (Ramsey, 2008, 2011) can inject such life into the confidence management tool. The provocative approach was discussed in Chapter 6. In summary, it advocates a polyphonic negotiated relationship between peers and involves three components (Ramsey 2008, p. 546) that construct a knowledge process. What makes this approach

appealing to this thesis is that all three of these components already exist within the medical knowledge process in the NHS. What is now needed is to nurture these components and ensure that they thrive and flourish.

The first component is that the learner has to be autonomous and own the process of knowledge creation. The interviewees in this research demonstrated independence and ownership of their knowledge building. Managers who support this confidence building tool should encourage this by ensuring the appropriate division of responsibility and accountability within the loops. For example, every member of staff should have a reasonable chance of attending conferences and also receive specific feedback on their performance. Collective responsivity is good for building the team but this should be carefully balanced to prevent stagnation in certain parts of the loops.

Secondly, the knowledge content should be provocative. Given the nature of medical knowledge, which is changing (see Chapter 6) and highly context-dependant (e.g., patients' needs), the current theoretical medical knowledge is provocative. What managers need to ensure is that such provocation is not only accepted but also celebrated. Medical staff should be encouraged to debate difficult issues, search out controversial points and not simply seek consensus, as this can lead to group-think.

Finally, the medical practice should be seen as a changing product within a dynamic, ongoing dialogic relationship. Making improvements to practice should be the aim of these loops. Maintaining the status quo is to be avoided. The aspiration to make changes in practice will encourage the team members to engage with external sources of knowledge, particularly conferences, to introduce the necessary development.

All of the necessary components of the provocative approach to learning exist within the NHS. These components need to be activated and encouraged. The results will be autonomous doctors who own their knowledge building process and engage with difficult, challenging new information to ensure a dynamic practice that meets all patients' needs.

A confidence-based tool to manage knowledge has been proposed using the explanatory power of the theory. Confidence is not only a significant part of knowledge but also the part that is likely to produce problems. The tool suggests that staff confidence should be

subjected to continuous tension based on feedback regarding performance. Such feedback is provided as audited outcome data and benchmarked against good standards elsewhere. At first, this tool might appear costly to implement, and intimidating and disruptive to staff. However, the costs should be offset by the resulting enhanced performance, which should gain staff trust and engagement. The provocative approach to learning and its associated challenges should make the process interesting and dynamic.

### 7.3 Reflections and future research directions:

My journey through this research project was the second[48] most informative and satisfying experience of my life. I have experienced social science for the first time and learnt about the superiority of qualitative[49] research. As a doctor, I feel that I have been liberated from the restricting boundaries of the positivist scientific paradigm. I can feel the meanings assigned by people to objects and search for people's understandings of social processes. I have come to believe that these issues are far more important to people and can explain their actions more effectively than statistical relevance or causal relationships. I no longer approach a problem (usually a research problem) with a hypothesis to test. I approach problems with an open mind to find a hypothesis that I have not thought about in the first instance. I became critical of my confidence (or lack of it) in my knowledge. I usually ask, "*What makes you so sure*?"[50] In managing my team, I have started looking into their (at times unjustified and misplaced) confidence rather than assessing their knowledge. I aim to keep confidence (mine as well as that of my staff) a live organism which moves and changes in response to the environment.

**The qualitative methodology** I used took me into a different terrain. As a doctor, I spend my life studying diseases together with their causes, as well as the related diagnostic tests and their accuracy. The qualitative approach to enquiry taught me the importance of studying human understanding of issues and the meanings humans give to phenomena, including diseases and diagnostic tests. I became aware of how our understanding of life and its meanings control how we see disease and how we choose diagnostic tests. This has changed how I manage my staff and I now have a deeper appreciation of my patients'

[48] The first was emigrating from my homeland 23 years ago and establishing a successful new life in a different culture.
[49] As opposed to the dominance of quantitative research, as explained by Uwe Flick (2009, p.25)
[50] "What makes you so sure?" is the title of an article by Ofra Mayseless and Arie Kruglanski (1987), Organizational Behavior and Human Decision Processes, 39, pp.162-183.

point of view. Grounded theory's demand for line-by-line coding forced me to consider every statement made during the interviews. I felt that I was not in control. I saw a different world unfolding before my eyes. Although my mind was thinking of sources of knowledge and how one should write better guidelines to guide doctors, groups of codes regarding confidence kept appearing after each interview. This was challenging to me. These codes argued against some of my assumptions; knowledge was within people not in the library. The detailed description of the grounded theory methodology and the step by step guidance provided by some references reassured me, particularly during the early stages of the coding, that my actions were valid. During the later stages, I started to see it working. I was pleasantly surprised by the outcomes. I felt that I had uncovered a new meaning of knowledge and can use this discovery to understand more clearly why people do what they do, whether this is during my interviews with them or when analysing some of the published experiments in the fields of sociology and psychology. This was very satisfying. However, applying grounded theory was tedious, time-consuming, and produced a massive number of open codes, and their management was tiresome and exhausting. Although being comprehensive managed to capture everything that the interviewees said, presenting the data in the limited space available in the thesis was hard. I became emotionally attached to all of my codes and the ideas behind them and struggled to leave any of them out. Grounded theory is ideal if you wish to dive deep into a subject, you have sufficient time and you are not restricted by space when presenting your findings.

**My research question** on the meaning of knowledge was highly relevant both to me and to the interviewees. Such relevance helped me to remain interested in the topic even during times of low mood and when the codes seemed chaotic. The interviewees answered my questions and engaged in the discussion enthusiastically, which helped me to keep going. It has proven easy to talk to a knowledge worker about their knowledge. My feeling of relevance is even stronger now. I now see myself managing knowledge, not staff. People come to work with confidence that allows them to complete their work. Looking after people's feelings suddenly became the focus of my leadership style. However, discussing knowledge is a huge task. It can be highly subjective, multidisciplinary and span many fields, ranging from ancient Aristotlean philosophy to recent views on artificial intelligence. At some stages, it sounded as if knowledge is life and my search for its meaning meant a search for the meaning of life. I started seeing knowledge everywhere, thanks to the grounded theory methodology, which kept bringing me back to what the

interviewees had said. Covering the literature was difficult and I know now that a comprehensive or near comprehensive coverage of the literature is simply impossible. I remained focused and that helped. However, looking back at the research topic, I belief that was a risky choice. The topic was massive, strongly contested and often illusive, but I am satisfied with my conclusions.

In my professional life, I noticed that I started unconsciously using my research conclusions. I initiated regular teleconferences for my staff (all doctors) to meet and exchange confidence, and the patients' outcomes of every clinical unit I manage are circulated to all staff every quarter so that the staff can gain the required feedback to adjust their confidence. I have started to encourage the staff to contact other experts at conferences and other venues and have started to face some of the obstacles that I expected to encounter, mainly the funding of staff time, conferences fees, etc. More importantly, I have started to care more about how the staff feel rather than what they do. I now consider that how a person feels will dictate how they will perform. As a senior clinician, a member of staff rang me once, concerned about an unusual situation with a child requiring a red cell exchange. I told them that I did not know the answer. There was no evidence in the literature to guide the decision in this situation and they had to work out a sensible plan, based on the patient's requirements. The member of staff concluded the call by saying, "Many thanks. It was very helpful talking to you. I knew you'd answer my questions". However, I had not given him/her any answers, as I did not have any. I gave them confidence. I am planning to discuss the knowledge management tool I designed with the senior managers within my organisation. The implementation of this tool will hopefully be my next project.

Within my personal life, the DBA project was the second most important journey I have experienced my life. It was also longer than any other project I have undertaken.[51] I have probably read about the research topic and the methodology more than most other issues. I own more books on this subject than any other and have definitely written more about the research topics than any other subject in my life. The experience was intellectually enjoyable. I became more confident about tackling/discussing any of the big ideas around

[51] The DBA lasted for ten years. I only spent seven years at Medical School and five years doing my speciality training.

me. However, sometimes I feel that I have inflicted suffering on my family that I was not expecting. I have to ensure that the outcomes of this DBA are used and useful. This will make my wife and children proud.

**Future research directions**: The emergent theory has been constructed at an adequate level of abstraction and so it could form a nucleus for a formal theory that can be applied to knowledge and its management in a wider context and over a larger scope (Glaser & Strauss, 1967, p.79). However, this would require examining the applicability of this theory to different groups of medics; e.g., surgeons and radiologists, other groups of staff, e.g. nurses and physiotherapists, and even staff outside healthcare, such as lawyers and teachers.

Testing the applicability of this theory within a different philosophical framework would be very interesting. This dissertation was completed within an interpretative approach, which assumes a stable non-contested social context. Applying the emergent theory within the critical theory framework with its *"emancipatory interest in human autonomy"* (Blaikie, 2007, p.140) and where the struggle for power is a central theme should reveal more about the nature of knowledge; after all, 'knowledge is power'.[52] The interaction between fallible confidence and the struggle for power should be a fertile field of social research.

[52] The prase *'knowledge is power'*, or ***'scientia potentia est'*** in Latin, is attributed to Sir Francis Bacon's *Meditationes Sacrae* (1597). It is also found in the 1668 version of the *Leviathan* by Thomas, who was secretary to Bacon as a young man.

## Chapter 8

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## Appendix I

## Memo-writing:

Memo-writing is a journal of the researcher's thought process that contributed to the research outcomes.

> *"Memo-writing is the methodological link, the distillation process, through which the researcher transforms data into theory"* (Lempert, 2007, p.345, quoted in Charmaz, 2014, p.164).

I wrote memos from the early stages of this project, based on Charmaz's guidance, as follows:

> *"When you write memos, you stop and analyse your ideas about the codes in any - and every - way that occurs to you during the moment…Memo-writing constitutes a crucial method in grounded theory because it prompts you to analyse your data and codes early in the research process. Writing successive memos throughout the research process keeps you involved in the analysis and helps you to increase the level of abstraction of your ideas. Certain codes stand out and take form as theoretical categories as you write successive memos. Memos catch your thoughts, capture the comparisons and connections you make, and crystallize questions and directions for you to pursue. Memo-writing creates an interactive space for conversing with yourself about your data, codes, ideas and hunches. Questions arise. New ideas occur to you during the act of writing. Your standpoint and assumptions can become visible. You will make discoveries about yourself"* (Charmaz, 2014, p.162-163).

Memo-writing is a creative process that will depend on the researcher's preferences. Charmaz (2014) advises: *"Do what works for you but aim to make your memos increasingly analytic" "Follow the writing routes that fit the way you think and work"* (pp. 165 and 168).

The characteristics of my memos in this project are as follows (see an example later in this section): Memos were spontaneous and unplanned, and I used them to capture an idea or observation whenever and wherever these arose. They were informal, usually written in pencil (to allow modifications if required) and of variable length. The memos were dated, written on loose papers and kept in chronological order in a folder, also called a 'memo bank' (Clark, 2005). I wrote them in stages. A memo was rarely completed at the same time; one or two parts of it were usually written first to capture the idea (see the memo structure below), with the rest of the memo being completed at a later date. Different sections of a memo may be revised, modified, tweaked or completely rewritten. It is unlikely that a full memo would be deleted or completely rewritten. If that became necessary, I would start a new memo. The old one was kept to show the process of my thought development. I wrote most of the memos, while a few of them were in the form of a drawing

or graph. One of the most common reasons for modifying a memo was to transform it from being descriptive into something more analytic in nature. I wrote memos according to a certain structure (see below) to enable comparison between memos and encourage the full development of ideas. Most of the memos contributed to the discussion of the various categories and so played a part in the construction of the final theory. These memos were not intended to be shared (Charmaz, 2014, p.184). The language used was not necessarily elegant, to ensure the spontaneous nature of the memos (however, all were written in English). The memos were not intended to be evaluated by examiners and tutors for their quality. The quality of the memo-writing process is proven by the coherence of the ultimate theory. Around 47 memos were completed, and many small notes were later gathered together into a small number of memos. Most of the memos were in written form and nine were graphic, involving boxes and arrows.

The written memos (which constitute the majority) were constructed according to the following six-step structure which was adopted from examples provided by Urquhart (2013, p. 120):

- A statement describing the purpose of the memo or a title
- Examples from the interviews
- An analysis of the data, codes or related ideas: what process is at issue, how it is defined, to what extent is it explicit (or implicit), and under which conditions does this process develop? (Charmaz, 2014, p.169)
- Relevant questions are asked (but not necessarily answered)
- The researcher's opinion is explained as a record of what is seen to be happening in the data (Charmaz, 2014, p.169)
- The analysis and/or opinion are related to the existing literature.

Memo-writing created a space in which the researcher could think about the data and codes and take a fresh look at familiar data (Charmaz, 2014, p 167). It was also used to stop uncontrolled, directionless data collection. Memos were particularly useful in achieving the following:

1. Ensuring the continuous comparison of data and codes which allowed the simultaneous analysis and data collection which directed the further data collection. These are fundamental features of the grounded theory methodology. Charmaz (2014) writes: "Much of your memo-writing will be concerned with making comparisons" (p.181).

2. Asking new questions which could lead to different interpretations of the data or further data collection. It also captures the researcher's views and feelings shortly after the interviews as well as further crystallising the existing ideas. As Charmaz (2014) stated: *"Memo-writing helps you to…continue to interact with your data…develop your writer's voice…construct new ideas"* (p.183).
3. Identifying gaps in the data and codes. These could be weak categories, a lack of data or unanswered questions.
4. Helping to transform descriptive codes into analytic ones and increase the overall abstraction of the codes and categories to improve their generalisability.
5. Reflexivity was documented in the memos. Almost all of the reflexive thoughts (described later in this chapter) were detailed and developed in the memos.

**An example memo:**

Title: Bad sources, bad knowledge:

"Lack of practice, particularly in uncommon topics (e.g. rare viruses), was seen as an obstacle facing knowledge generation. This is consistent with selective code 3 where practice was seen as a major source of knowledge.

"The participant doubted the credibility of some publications including books (being outdated) and very influential journals (may publish rubbish articles). This is an interesting view because it brings struggle to the process. It would be important to know how practitioners resolve this dilemma regarding a major source of their knowledge, i.e. publications.

"The participant explained the difficulty with new publications. This was made more difficult and complex if the new publication contradicted previous practice. This explains that worrying and struggling are part of acquiring new knowledge. "Expert" people themselves may be a source of incorrect or misleading knowledge if they have big ego, personality clashes or are over confident. This would add more to the worry and the struggle.

"The participant provided a pragmatic solution to manage these difficulties - to accept what is available even if it is less reliable. This probably indicates that less knowledge and not very reliable knowledge are still better than no knowledge. This point requires further explanation in subsequent interviews.

"Selective code 4 (worrying about bad sources of knowledge) relates to selective code 3 (struggling for good sources of knowledge). They could represent the extreme ends of one

selective code (e.g. quality of knowledge sources) or they could be two separate selective codes which balance each other in supporting a core category for the theory.

"In medicine, good sources of knowledge can be of measurable benefit. For example, the journal of the American College of Cardiology (Bucholz *et al.,* 2006) showed that adherence to treatment guidelines is associated with better outcomes for patients. However, according to Professor John Ioannidis of Stanford University, respectable sources of knowledge such as meta-analyses[53] can be sources of confusion and biases (BMJ 2016;354: i5184). This means that meta-analyses can be a source of the problem (i.e. bias) which they (i.e. meta-analyses) were created to prevent in the first place. The BMJ has a regular section to discuss 'uncertainties' in medical knowledge. Mahmood *et al*. (2016) discussed uncertainties around the use of a particular medication (tranexamic acid) to stop bleeding following traumatic brain injuries. This paper provided evidence for uncertainty, rather than evidence for good practice. It seems that struggle to find reliable sources of knowledge is at the heart of knowledge acquisition process."

[53] Meta-analysis is a quantitative, formal, epidemiological study design that is used systematically to assess previous research studies to derive conclusions about that body of research (Haidich, 2010).

# Appendix II

## The research authorisation and ethical approval

Sheffield Hallam University

SHARPENS YOUR THINKING

Secretary and Registrar's Directorate
City Campus Howard Street
Sheffield S1 1WB

GT/RDSC
27 September 2012

Tel no: 0114 225 4047
E-mail: g.taylor@shu.ac.uk

Dr KAB El-Ghariani
2 Coldwell Lane
Sheffield
South Yorkshire
S10 5TL

Dear Dr El-Ghariani

**Approval of Approval of Phase III Research Project and Supervisory Team in the Thesis Stage of the DBA**

At its meeting on 26 September 2012 the Research Degrees Sub-Committee noted receipt of the information requested and I am pleased to inform you that it was satisfactory. Your application is now fully approved.

The next stage for you will be approval of your thesis title and examining team. These details should be proposed on form DB3 by your Director of Studies, and submitted to Student Systems and Records (Research Degrees) at least 4 months in advance of submission of your thesis. In your case we would expect to receive a DB3 no later than 3 July 2015. Your registration details are also attached.

If you have any queries, please contact Student Systems and Records (Research Degrees) based at City Campus, using the contact details above.

Yours sincerely

Secretary
Research Degrees Sub-Committee

cc Director of Studies
Head of Programme Area (Research Degrees)
Research Administrator

Enc

Sheffield Teaching Hospitals NHS

NHS Foundation Trust

28 October 2013

Dr Khaled El-Ghariani
National Blood Service
Longley Lane
Sheffield
S5 7JN

Dear Dr El-Ghariani,

## Project Authorisation
## NHS Permission for Research to Commence

| | |
|---|---|
| **STH ref:** | 18057 |
| **REC ref:** | NA |
| **Study title:** | Understanding the Concept of Knowledge in the National Health Service |
| **Chief Investigator:** | Dr Khaled El-Ghariani, Sheffield Teaching Hospitals NHS Foundation Trust |
| **Principal Investigator:** | Dr Khaled El-Ghariani, Sheffield Teaching Hospitals NHS Foundation Trust |
| **Sponsor:** | Sheffield Hallam University |
| **Funder:** | NA |

**The Research Department has received the required documentation as listed below:**

| | | |
|---|---|---|
| 1. | **STH registration document** | R&D Form, Last signature 27 Sep 13 |
| 2. | **Evidence of favourable scientific review** | SHU Research Degrees Sub-Committee, Letter dated 27 Sep 13 |
| 3. | **Protocol – final version** | SHUREC1 Form, signed 05 Jul 13 |
| 4. | **Participant Information sheet** | V1, 04 Jul 13 |
| 5. | **Consent form** | V1, 04 Jul 13 |
| 6. | **Ethical review- Letter of approval from NHS REC or UREC** | SHU - Sheffield Business School REC, Last signature 05 Aug 13 |
| 7. | **Site Specific Assessment** | 22 Oct 13 |
| 8. | **Evidence of hosting approvals** | |
| | - **Research Finance** | RMS, ER Fraser 29 Jul 13 |
| | - **Data Protection Officer** | RMS, P Wilson 08 Jul 13 |
| 9. | **Associated documents** | |
| | - **PI CV** | Jul 13 |

**This project has been reviewed by the Research Department. NHS permission for the above research to commence has been granted on the basis described in the application form, protocol and supporting documentation** on the understanding that the study is conducted in accordance with the Research Governance Framework, GCP and Sheffield Teaching Hospitals policies and procedures (see attached appendix).

Yours sincerely,

**Professor S Heller**
**Director of R&D, Sheffield Teaching Hospitals NHS Foundation Trust**
**Telephone +44 (0) 114 2265934**
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Sheffield Hallam University

SHARPENS YOUR THINKING

Secretary and Registrar's Directorate
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Research Student Registration Details

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Director of Studies: Dr Murray Clark

Course: 44RDBUAD01R1 DB BUS ADMIN

Stage: RF3 EXAMINATION ARRANGEMENTS EXPECTED

Start of Registration: 04/Feb/2008

Original Expiry: 31/Jul/2014 Current Expiry: 03/Nov/2015

Days in Registration: 1697
Total Days Suspended: 273
Days Extended including Days Suspended: 273
Days Left: 1132

**Full Title of Thesis:**

Understanding the Concept of Knowledge in Healthcare Services: A Grounded Approach

If any of the details on this form are incomplete or incorrect please contact:
Student Systems and Records (Research Degrees), City Campus, Sheffield, S1 1WB