Exploring the development of innovative work behaviour of employees in multiple workplace contexts

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Declaration

I hereby declare that the work presented in this thesis has not been submitted for any other degree or professional qualification, and that it is the result of my own independent work.

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Date

Abstract

The research reported in this thesis explored the factors that influence the development of innovative work behaviour (i.e. recognition of the need to innovate, idea creation, idea championing and, idea implementation). The study is underpinned by Social Cognitive Theory to encapsulate the multiple relationships that exist between cognitive factors, environmental factors and behavioural factors that enhance innovative work behaviour. A multi methods case study approach was used to gather data and highlight contextual differences that emerged from qualitative and quantitative data collection. This included the use of interviews, focus groups and a questionnaire across three case studies: a Scottish University, a Finnish University and, an English National Health Service Trust.

The findings show that there are three main types of factors that influence innovative work behaviour: (1) information and knowledge related factors (e.g. information literacy, information behaviours, knowledge management and Communities of Practice); (2) contextual factors such as organisational strategy, culture, leadership, training and, access to resources and; (3) the skills and abilities of employees. Information literacy is an initiator of innovative work behaviour and is used to help employees to set context to help them recognise the need to innovate. Information behaviours are specific to each stage and the need to use information. Knowledge sharing enhances innovative work behaviour but requires skills and abilities from employees in terms of social interactions skills to facilitate the knowledge sharing. Organisational culture and leadership interact to help employees at all stages of innovative work behaviour.

A key contribution of this work is that it provides a framework to explain the factors that influence the stages of innovative work behaviour development, which has not been done in prior studies. In addition, it extends the application of the whole of Social Cognitive Theory to information science research on workplace learning and innovative work behaviour. The practical contributions of this work are the recommendations to practitioners. These recommendations include the need to recognise the importance of information literacy in a digital age, the use of interactive information sources, the need to stimulate communication in the workplace and to assess available resources.

Publications associated with this work

Middleton, L., Hall, H., Muir, L., & Raeside, R. (2018). The interaction between people, information and innovation: information literacy to underpin innovative work behaviour in a Finnish organisation. In L. Freund (Eds.), *Association for Information Science and Technology 81st Annual Meeting: Building an Ethical and Sustainable Information Future with Emerging Technologies* (pp. 367-376). Somerset, NJ: John Wiley & Sons, Inc.

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Table of contents

List of tables

List of figures

Abbreviations

Abbreviation	Term
CoPs	Communities of Practice
HRM	Human Resource Management
IWB	Innovative Work Behaviour
IB	Information Behaviour
IL	Information Literacy
KM	Knowledge Management
OECD	Organisation for Economic Co-operation and Development
SCT	Social Cognitive Theory
WPL	Workplace Learning

1 Chapter 1: Introduction

1.1 Background to the study

Innovation has been regarded as valuable to competitive advantage in the changeable global economic and social climate since the 1970s (Anderson et al., 2004, p.149). This value in innovation was recognised by Scottish Government towards the end of the 1990s when Scotland aligned innovation performance with the UK average (Michie et al., 2001, p.1). By the 2000s innovation performance in Scottish organisations had increased, but only 56.3% of Scottish firms were involved in innovation activity (Freel & Harrison, 2007). Innovation related performance was high in primary, knowledge intensive sectors and business services and improvements were required in manufacturing and service sectors (Freel & Harrison, 2007, p.ii).

Employees within organisations are at the heart of innovation development (Ellström, 2010; Høyrup, 2010). In these instances, it is acknowledged that employee-led innovation can be learned. Therefore, the collective innovation performance of organisations relies heavily on the enhancement of employee-led innovation. The enhancement of employee-led innovation has benefits to employees (e.g. Alasoini, 2015; Pot). These benefits include employee skill development and increased knowledge acquisition.

The investment of The Scottish Government in innovation is evidenced in *The Scottish Economic Recovery Plan (2015).* In this strategy, collective innovation is known to enhance performance of organisations. In addition, the strategy acknowledges the role of employees in the enhancement of organisational innovation and the behaviours employees exhibit to improve innovation in the workplace. Here, the strengths and talents of people (human capital), organisational resources and infrastructure play in the enhancement of innovation and are a focus of improvement within the strategy (2015, p.7). The work of the Scottish Government has included work with Skills Development Scotland to improve investment in employee skill development (e.g. *Fair Work Convention Framework,* Fair Work Convention, 2016).

Little is known about the specific factors that enhance and inhibit employee-led innovation in the workplace, and how these factors influence the innovative

behaviours of employees. Consequently, knowledge is scarce on how organisations are able to successfully support employees to innovate, and the specific factors in the organisational context (e.g. the environment, behaviours of others and, informational practices) which allow this enhancement to occur.

1.2 Study aims

The aims of this research reported in this thesis were to explore the factors that influence the development of innovative work behaviour, and to explain how organisations can support employees to develop innovative work behaviour through processes of workplace learning. To do so, the study aimed to answer a series of research questions to identify the informational and contextual factors that enhance and inhibit innovative work behaviour. In answering the research questions, the study also aimed to explore how these factors contribute to innovate work behaviour development.

A final aim of the study was to create a framework to explain how organisations can support the development of innovative work behaviour from employees (i.e. the recognition of the need to innovate, idea creation, idea championing and, idea implementation). This practical outcome of the study was supported by a series of recommendations to practitioners who work with organisations to make improvements to employee-led innovation.

From the study of the literature, three research questions were answered as part of this work:

>**RQ1:** How does information literacy (including the associated information behaviours) support successful workplace learning as related to the development of innovative work behaviour?

>**RQ2:** How do contextual factors support innovative work behaviour for application at individual and collective levels in the workplace?

>**RQ3:** What are the determinants (i.e. signals or indicators) of successful workplace learning for innovative work behaviour?

1.3 Contributions of the research

This work represents a significant, original and novel contribution to both theory and practice. Knowledge was furnished on the role of information literacy to the

enhancement of innovative work behaviour, and the specific information behaviours relevant to each stage of innovative work behaviour development. In addition, knowledge was created on the role of organisational culture, leadership and, skills and abilities of employees in innovative work behaviour development. This knowledge was used to create a framework to explain the factors that influence the stages of innovative work behaviour development, which has not been done in prior studies.

In addition, the research extends the application of the whole of Social Cognitive Theory (SCT) to information science research on workplace learning and innovative work behaviour. This is because prior work has applied individual concepts within SCT (e.g. self-efficacy) to information science research, but not the theory as a whole concept.

The practical contributions of this work are the recommendations for practice. These recommendations include the need to recognise the importance of information literacy in a digital age, the use of more interactive information sources in the workplace, the need to stimulate communication between employees and, the need to assess the available resources in the workplace.

1.4 Thesis structure

The thesis comprises eight remaining chapters. In chapter 2, a critical analysis of the literature related to the development of innovative work behaviour is presented. This serves to: (1) identity the conceptual differences presented in literature related to innovation to determine the specific focus of this research and; (2) discuss concepts related to the development of innovative work behaviour (e.g. information literacy, information behaviours, organisational context and, skills of employees). These processes serve to identify the knowledge gap to be studied in the doctoral work and provide details of the methods that have been applied in prior innovation studies.

In chapter 3, Bandura's Social Cognitive Theory (1986) is discussed as the theoretical framework that underpins this doctoral work. Evidence is presented here as to prior (and limited) application of the *whole* of SCT to Information Science work and the need to extend the application to the study of workplace learning and innovative work behaviour.

The content of chapter 4 is devoted to discussion of the methodology used in this research. Outlined in chapter 4 are the research questions and the methodical approaches used to answer the questions. This includes the specific methods used to collect and analyse data as part of the approach. Justification of the approach and methods are provided throughout the chapter including reasons for the pragmatic multi-method approach used in the collection of qualitative and quantitative data.

Chapters 5, 6 and, 7, contain the findings from the empirical work undertaken as part of the research. The findings are presented separately for each case study organisation. In each chapter, factors that influence innovative work behaviour are evaluated, and findings are presented on how these factors either enhance or inhibit innovative work behaviour.

In chapter 8 a discussion of research findings from the preceding chapters is presented. This includes the means by which the findings of the study answer the research questions, including how the findings of this research relate to the literature in Chapter 2 of the thesis. In addition, the application of Social Cognitive Theory (1986) in Information Science research on workplace learning and innovative work behaviour is discussed in relation to the findings from the empirical work. This is followed by the creation of the framework to explain how organisations can support innovative work behaviour.

Finally, in chapter 9, the thesis is concluded with a summary of the main finings when answering the research questions and also the contributions to knowledge. This is followed by an explanation of the contributions of practice and recommendations for practitioners. The strengths and limitations of the research design are then discussed along with future work.

Chapter 2: Literature review

2.1 Introduction

In this chapter a literature review is presented. The literature review begins with an explanation of the processes used to assemble and analyse literature relevant to the themes of information literacy, information behaviour, knowledge management, organisational culture and strategy, leadership, and, the provision of suitable infrastructure. The literature is taken from across a range of disciplines. This is followed by a discussion of the key concepts of the thesis, namely organisational innovation, employee-led innovation (including innovative work behaviour), and workplace learning. Some of these terms are contested and are used interchangeably in prior work. For these reasons, there is the need to define and interpret these concepts as deployed in this thesis. The main content of the chapter, however, is concerned with the factors that support the development of innovative work behaviour. These include contributions from information science (specifically related to information literacy, knowledge management, and Communities of Practice), material on organisational contexts, and an assessment of individual skills and abilities.

2.2 Literature search and review: the process

The findings of the literature review were drawn from searches of peer-reviewed publications. The search included sources from journal articles and books from the field of library and information science, as well as some employment and organisational studies related fields. Titles from the field of library and information science included: *Information Research, Journal of Information Science, Journal of Librarianship and Information Science, International Journal, Journal of the American Society for Information Science and Technology* and *Information Science Research.* The search also included entering a number of search terms into a variety of online databases (see Table 1). The databases included*: ABI/INFORM Collection, Emerald Journals, Google Scholar, JSTOR, Library & Information Science Abstracts, Library, Information Science & Technology Abstracts, SAGE Journals Online, Science Direct,* and the *Wiley Online Library.* As a result, some of the publications sourced had been published in sources with titles as relevant to computer science, management, psychology and organisational behaviour and human resource

management such as: *Computers in Education, Creativity and Innovation Management, European Journal of Work and Organisational Psychology, International Journal of Business, Humanities and Technology, Journal of Workplace Learning* and *Transfer.*

In addition to the literature search process identified above, each relevant article was also used to chain reference forwards and backwards. The purpose of this process was to identify the key authors and publication cited by other authors within the same fields (Hart, 2002, p.39). This allowed for authors to be ranked in terms of importance of innovative work behaviour development in relation to workplace learning.

Table 1: Key search terms entered into literature databases

Term 1		Term 2		Term 3
Innovative work behaviour	**and**	'Context' OR 'Organisational context'	**and***	Leadership Infrastructure
Employee led innovation		Information		Literacy Behaviour Use
Employee innovation		Skills		
Innovative behaviour		Abilities		
		Development		
Workplace learning, Innovation	**and**	Definition	**and**	Types

*If journal articles revealed/explored multiple factors suggested to influence the development of innovative work behaviour (in one study), more specific search terms (Term 3) were then used to identify literature on the specific factors.

2.3 Key concepts: Organisational innovation, employee-led innovation, and workplace learning

In this section, the key concepts discussed in the thesis are defined. This is because some of the key concepts are contested and used interchangeably to mean the same thing, when definitions differ. The sub-sections that follow define organisational innovation, employee-led innovation (including innovative work behaviour), and workplace learning in the literature. In light of the existing variations in definitions of these concepts in the literature, the concepts are then defined as used in this research.

2.3.1 Organisational innovation

Generally, innovation is considered as the practice of generating and implementing, integrating new ideas, practices and artefacts into organisations (Van de Ven et al., 2000, p.12). There are four main classifications of innovation. These are: (1) making changes to goods or services – product innovation; (2) production and delivery of goods and services – process innovation; (3) marketing of goods and services – marketing innovation and; (4) implementation of new organisational methods – organisational innovation (Boer & During, 2000, p.83; Høyrup, 2010, p.145; OECD, 2005, p.16-17). Organisational innovation is important to this work so it will be discussed in further detail.

Organisational innovation is the development of new organisational methods in relation to business practices, workplace organisation or external relations (OECD, 2015, p.16-17). It involves changes to routines to improve efficiency, productivity, performance and also profitability, and to contribute to the flexibility and creativity of the organisation (Potočnik & Anderson, 2012, p.497; Volberda et al., 2013).

One type of organisational innovation relates to increasing 'innovative capability'. Innovative capability is the ability to develop new products to satisfy market needs, implement better technological processes, and to adopt new products and technological processes in the future to help respond to the unpredictable nature of change (Aulawi, et al., 2009, p.2239). Innovation capability can occur on the individual level and the organisational level (Angehrn et al., 2001). For example, organisational innovative capability is related to the improvement of efficiency, productivity, performance and profitability of the organisation in terms of the flexibility and creativity within organisations (Potočnik & Anderson, 2012, p.497; Volberda et al., 2013). It refers to the application of agile methods as a way to deal with complex and dynamic business environments (Suominen & Jussila, 2009). Organisational innovation capability is a formation within the organisation. This formation encapsulates elements of organisational culture and values, leadership, processes and tools (Suominen & Jussila, 2009, p.3). However, innovation capability is also presented on the level of individual employees (Suominen & Jussila, 2009, p.3). It is a human activity and depends highly on employees and

their own capability to innovate (De Spiegelaere et al., 2014, p.318). Individual innovative capability is not a skill in itself but a combination of skills, abilities and attributes directed towards innovation (Innovation & Business Skills, Australia, 2009, p.1). It has specific focus on generating and implementing new ideas within the workplace, and engagement in the process of doing so. The role of the organisational and individual employees in innovative capability are demonstrated in the Model of Innovation Capability by Suominen and Jussila (2009) (see Figure 1).
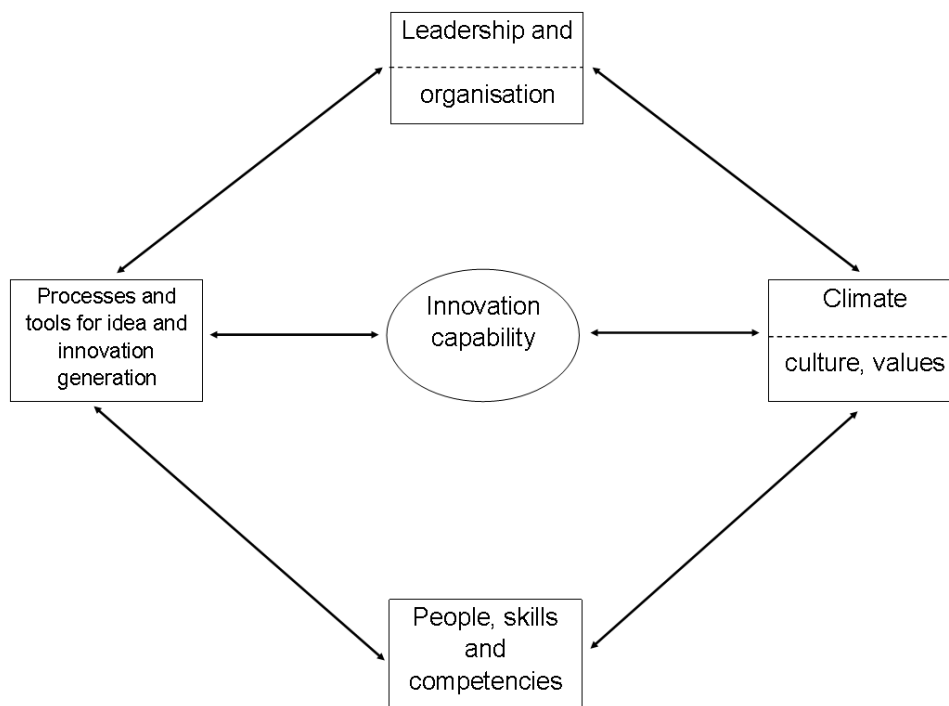
Figure 1: Integrated Model of Innovation Capability, Suominen and Jussila (2009)

2.3.2 Employee led innovation

There are two types of employee-led innovation. These are: (1) individual innovative behaviour and; (2) innovative work behaviour.

Individual innovative behaviour is the evaluation of approaches and tools used in the creation of new ideas and approaches in the workplace (Kleysen & Street, 2001, p.284). Employees evaluate existing approaches and tools with the aim of developing new ones. Innovative work behaviour is more specific.

Innovative work behaviour is the intentional generation of new ideas within a role, group or organisation whereby the idea is implemented within the organisation once created (Battistelli et al., 2013, p.27; West & Farr, 1990, p. 5-

7). Unlike individual innovative behaviour, when employees exhibit innovative work behaviour, they participate actively in the innovation process *with the intention* of creating and implementing new ideas in the workplace (de Jong & den Hartog, 2010; West & Farr, 1990). Employees initially recognise that they need to innovate. They then exhibit specific behaviours in order to innovate (i.e. create ideas, champion ideas and implement ideas in the workplace). These behaviours are purposefully carried out by employees in order to create new ideas and implement them in the workplace (Battistelli et al., 2013; West & Farr, 1990).

Taking these processes into account, and drawing upon work by West and Farr (1990) and Battistelli et al. (2013), *innovative work behaviour* is the concept explored in this thesis.

Table 2: Definitions of individual innovative behaviour and innovative work behaviour

Concept	Definition
Individual innovative behaviour	The evaluation of approaches and tools used in the creation of new ideas and approaches in the workplace.
Innovative work behaviour	The intentional generation of new ideas within a role, group or organisation whereby the idea is implemented within the organisation once created.

It is possible to argue that workplace learning can be deployed to enhance innovative work behaviour (see Ellström, 2010; Høyrup, 2010). The relationship between workplace learning and innovation has previously been explored (e.g. Høyrup, 2010). Emphasis here has been on employee-led innovation as described above. Ellström (2010) suggests that the central role of learning in the approach to innovation research. Høyrup (2010) makes the relationship explicit and states that innovation processes are conceptualised as learning processes. Learning is seen as a mechanism behind employee-led innovation (e.g. it is both practice-based and employee driven just like innovation) (Høyrup, 2010, p.151). Høyrup also highlights the difference between innovation and innovative work behaviour: innovative behaviour can lead to innovation, but it can also lead to failure. Failure from innovative behaviour can lead to the development of innovation from mistakes directly. In turn, innovative behaviour can be created through innovative learning (Høyrup, 2010, p.152).

However, as with innovation, definitions within the literature have been varied for workplace learning and used interchangeably. This justifies the need to define workplace learning as used in this thesis.

2.3.3 Workplace learning

In general, workplace learning is defined as 'learning for work, learning at work and learning through work' (Seagrave et al., 1996, cited in Ramage, 2014, p. 489). More specifically, workplace learning refers to all learning activities that employees undertake in relation to their work (Kynd & Baert, 2013). It refers to knowledge, skills and qualifications acquired from these activities (Illeris, 2011, p.34) including occupational knowledge unavailable within the educational setting (Billet, 2012, p.3477).

There are two main categorisations of workplace learning. These are: (1) formal workplace learning and; (2) informal workplace learning.

Formal workplace learning is 'on the job' learning that takes place outside of the working environment. It is typically in a classroom-based formalised setting, comprising planned learning activities with the intention of acquiring new knowledge or improving skills (Manuti et al., 2015, p.4), for example, employee participation in training (e.g. in a classroom style setting). Training updates knowledge and develops skills to improve abilities and learn to perform tasks better (Antonacopoulou, 1999, p.15; Palo & Padhi, 2003, p.204; Silberman & Auerbach, 2006, p.1).

Informal workplace learning is also 'on the job'. However, informal workplace learning is not classroom based and involves unstructured social interaction processes between employees themselves (Cacciattolo, 2015; Doornbos et al., 2008, p.130). For example, employees learn if they are given more autonomy as part of their roles (Parker et al., 2001, p.212). This autonomy allows employees to explore new approaches further and make decisions on how to best approach tasks (Liu et al., 2005, p.326). Other information learning includes coaching in the workplace. Informal coaching from others helps employees to learn informally (Kynsdt et al., p.375). This helps employees to learn through socialisation and interaction processes where desired behaviour is often imitated by employees (Swart & Harcup, 2012, p351). Informal workplace learning also occurs through day-to-day interactions within the

working environment (Casey, 2005, p.133; Marsick, 2006, p.57). These interactions between employees are valuable to allow for the exchange ad sharing of knowledge in the learning process (Elkjager, 2003, p.41; Za et al., 2014, p.1023).

Taking into consideration the information above, drawing on the work of Jacobs and Park (2009), workplace learning is defined in Table 3 below.

Table 3: The definition of workplace learning in this research

Concept	Definition
Workplace learning	The acquisition of employment and organisational specific skills and knowledge, through means of gaining experiences within the organisation itself. For the purpose of the current research, workplace learning encapsulates multiple ways in which people learn in organisations, such as through formal training delivery or informal interaction and knowledge sharing processes.

2.4 The development of innovative work behaviour

There are many factors reported in the literature to have influenced the development of innovative work behaviour. The factors studied differ depending on the domain focus of the prior work and the methods used to generate findings. The focus of this literature review comprises evidence presented from three main literature domains: (1) the contributions of innovative work behaviour development from Information Science literature and related areas; (2) organisational contexts for the development of innovative work behaviour from the organisational studies domain and; (3) individual skills and abilities for the development of innovative work behaviour from the Psychology domain.

2.4.1 Contributions from Information Science and related areas on the development of innovative work behaviour

There are many factors that influence the development of innovative work behaviour as demonstrated in Information Science literature. In this section, the literature is presented in relation to the study of information literacy and information behaviours, knowledge management and Communities of Practice (CoPs) that support the development of innovation in the workplace. The focus here is first of the progression of the study of information literacy from

educational contexts into workplace contexts, and the information behaviours which enhance innovative work behaviour. Following this, a discussion of the contribution of knowledge management literature and the related Communities of Practice literature support the exploration of factors that enhance innovative work behaviour development.

2.4.1.1 Information literacy and innovation in the workplace

There is an abundance of literature on information literacy. The focus of this literature review is the development of information literacy in workplace contexts.

The research on information literacy credits work of Zurkowski (1974) in early definitions of the term (e.g. Crawford, 2013). In 1974, Zurkowski reported that 'People trained in the application of information resources to their work can be called information literates. They have learned techniques and skills for utilizing the wide range of information tools as well as primary sources in moulding information solutions to their problems.' (Zurkowski, 1974, p.6). Zurkowski developed this definition further when he explained that 'being information literate means being able to find what is known or knowable on any subject' (Zurkowski, 1974, p.23). His definition was intertwined within the world of work (i.e. the employment context) because it defines how information is applied to the workplace context though the skills of employees. The development of information literacy definitions were later applied to employment not educational settings (see Behrens, 1994). Similarly, information literacy research has also shifted focus to educational and academic contexts. Core elements of this research have been not only on how people handle information but also how people can develop skills in educational contexts to become more information literate (e.g. Burchinal, 1976, p.8). More recent definitions of information literacy have also encapsulated the importance of the workplace context.

In work that uses such definitions, information literacy skills in the workplace are noted as embedded in practice and are often context dependent, just as in workplace learning (Lloyd, 2010, 2012). Information literacy is socially enacted and often comes with the agreement of stakeholders involved in the employment process (Lloyd, 2012, p.777).

There is much emphasis on people as a source of information (Goldstein & Whitworth, 2015, p.1). This means the appreciation of workplace information literacy derives from the social and informal ways in which information is transformed into knowledge (Williams et al., 2014, p.2-3).

Despite the differences in defintions noted above, the focus of information literacy research has often been the development of information literacy skills in educational setting. This has included information literacy framework development and associated practises in education (e.g. Bruce, 1995, 1997; Irving, 2011), information literacy as an initiator of educational change (e.g. Bruce, 2004), information literacy skills developmment in pupils and teachers (e.g Merchant & Hepworth, 2002; Probert, 2009) and assessment of information literacy outcomes in students (Detlor et al., 2011). The focus has also been on the general learning of students in educational settings (e.g. Adhikari et al., 2017). The application of information literacy to lifelong learning emphasises the importance of developing information literacy skills in the workplace for employees at all ages, not just student embarking on a career (see Johnston, 2016).

Since the 1990s information literacy research has also considered workplace contexts (e.g. Bruce, 1999a, 1999b) and later (Crawford & Irving, 2009; Lloyd, 2005; Tait & Edwards, 2016). More recently, workplace contexts have even included political environments (e.g. Elmborg, 2010; Kapitze 2001; Smith, 2013, 2014, 2016a), and quasi-work environments such as edemocracy (Hall, Cruickshank & Ryan, 2018).

Some researchers have identified difficulties in defining workplace information literacy. Williams et al. (2014) reviewed literature pertaining to information literacy, to identify how to best describe information literacy in the workplace; specific skills required for information literacy development in workplaces and whether such research adds value to information literacy in the workplace. The findings revealed that in a period between 1998 and 2014, much of the information literacy research focused on the educational domain. Similarly, many of the publications articulated the processing of information in social, informal and contextualized settings, the transformations of knowledge and information, and the creation, packaging and organisations of information in the workplace. This again highlighted the need to study information literacy in

workplace contexts further, and places emphasis on the role of information literacy directly in the workplace.

Further research by Inskip (2014) has discussed the importance of information literacy in the workplace. Similarly, Goldstein and Whitworth (2015) determined the value and impact of employing and training people to have suitable knowledge and competency in the handling of information and fostering environment to promote effective use of data and information (Goldstein & Whitworth, 2015, p.1). This research highlighted the importance of information literacy on multiple levels: individuals may benefit from such skills in terms of enhanced efficiency and employee satisfaction, whereas collectively the skills cold support organisational to achieve a competitive advantage over others (2015, p.1). An assessment tool was developed from this research as a 'means of identifying areas of workplace activity where investment in information literacy adds value; and it provides an opportunity for initiating some reflection on how and where IL contributes to the well-being of enterprises' (2015, p.1).

The research discussed above has identified: (1) the need for further research into the direct relationship of information literacy in workplace contexts and; (2) the ways in which information literacy can support and impact organisations. However, workplace learning (i.e. learning in workplace contexts) is not covered in depth. Goldstein and Whitworth (2015, p.1) explain how the reviews above 'counter the bias in the information literacy literature toward defining it as information searching competencies as displayed in higher education settings (Whitworth, 2014, p.74-81)'. This is because, in their words, 'Information literacy can be generally defined as the capacity to make critical judgments about information, as this capacity can be learned' (2015, p.1). As such, learning in educational contexts differs from learning in the workplace. Workplace learning is often less structured and is often more collaborative than in educational environments (Goldstein & Whitworth, 2015, p.1). Workplace learning can also take place in multiple ways (Cacciattolo, 2015).

It must be noted here that work has already focused on the impact of information on behaviour (e.g. information overload as noted in Cleverley et al., 2017; Desouza et al, 2008; Herbig & Kramer, 1994).

Research in the area of information literacy in the workplace often explores the learning of information literacy skills rather than the use of information literacy in the support of workplace learning. The focus has been on the building of skills and generic workplace competencies (e.g. Crawford & Irving, 2009). Little attention has been paid to the role of information literacy and other information behaviours in workpalce learning (e.g. Lloyd & Somerville, 2006). The learning of specific skllls, such as those needed for innovation, is a focus of this research.

2.4.1.2 Information behaviours and innovation in the workplace

In the past, innovation has been studied in respect of information behaviour and use (e.g. Hauschildt, 1996). This research encapsulates the individual processes required of people to innovate. For example, Hauschildt (1996, p.169) addresses the creativity processes involved in idea creation – one of the initial stages of innovation. However, some concerns are noted with in work by Hauschildt (1996) with the influence of information behaviour on the development of innovative work behaviour. Research by Hauschildt (1996) focuses on the use of information in process of creativity, and has not encapsulated innovation as a whole. This is also reflected in work by de Jong and Den Hartog (2008). Additionally, previous research has not centred on the main processes that make up innovative work behaviour (i.e. the recognition of the need to innovate, the creation of ideas, the championing of ideas and implementation). Therefore, further research is needed to explore specific information behaviours that may lead to or enhance the development of individual processes of innovative work behaviour.

Some research (e.g. Lavranos et al., 2015) has been carried out on specific information behaviour in relation to innovation. Here, the focus has been of the influence of information seeking behaviour in creativity, a skill associated with innovation (e.g. Lavranos et al., 2015; Conole et al., 2008). However, as with early work (e.g. Hauschildt, 1996) the work has focused on processes of creativity rather than the whole innovation process (i.e. idea creation and implementation). At the same time, researchers have explored the contribution of information seeking behaviour to the development of innovation capability from employees and note that creativity and innovation differ. For example, using a large-scale questionnaire, Popoola and Fagbola (2014) explored the

development of innovative capabilities of managers within manufacturing firms. Their study found that there were multiple relationships between information-seeking behaviour, information utilisation, knowledge sharing and the innovation capability of the respondents. Additionally, information seeking behaviour predicts the innovation capability of the respondents. However, to date, the specific contribution of information seeking in the development of innovative work behaviour (i.e. the four main processes) remains relatively unexplored and is therefore addressed in the thesis.

Some work, however, focuses on information flows within the workplace as related to the enhancement of innovation (e.g. Baker & Freeland, 2017; Mustonen-Ollila & Lyytinen, 2003).

In addition, some prior work has focused on the contribution of information and analysis and interpretation to innovation (e.g. Jiménez-Jiménez & Sanz-Valle, 2011; Tippins & Sohi, 2003) but not innovative work behaviour. Further work is required to determine the impact of specific information behaviours on innovation as a whole. This is exemplified with early work (e.g. Hauschildt, 1996) where the focus is on initial stages of the innovation process (e.g. creativity) as opposed to all processes in innovation as noted above (see section 2.3.2).

Knowledge sharing is also an information behaviour that has received attention from researchers. However, as it is related specifically to organisational learning (as opposed to learning of the individual employee in the workplace), knowledge sharing is discussed further as part of the knowledge management approach below.

2.4.1.3 Knowledge management and innovation in the workplace

Some information science researchers focus on Knowledge Management. Knowledge management is of relevance to the study reported in this thesis because it is the process of creating, retaining and effectively using knowledge within an organisation (Detlor et al.,2006, p.117; Za et al., 2014). Knowledge transfer and knowledge sharing are important in workplace learning and innovative work behaviour. If these are managed effectively, they can impact on organisational performance and competitive advantage (Birkinshaw et al., 2008, p.822-825; He & Abdous, 2013; Liu & Lai, 2011; Pina et al., 2013; Said, 2015).

The focus here is on organisational learning whereby knowledge is created and shared within the organisation on the collective level (Za et al., 2014).

The complexity of the knowledge management approach in enhancing innovation within organisations has been addressed by Du Plessis, (2007). Her research emphasises the increase in the availability of knowledge in the workplace and the idea that knowledge can be used as the basis for innovation (Du Plessis, 2007, p.20). The availability and reach of knowledge created must be managed within organisations to support successful innovation (see Darroch & McNaughton, 2002; Pyka, 2002; Shani et al., 2003). This is also the case for tacit knowledge transfer and firm capability (e.g. Cavusgil et al.2003).

Later research has focused more on the adoption of knowledge management as an approach to improve organisational innovation capabilities and performance (e.g. Akram et al., 2011; Chen & Huang, 2009; Nawab et al., 2013). Chen and Huhang (2009) for example, applied a quantitative survey method approach of nearly 150 organisations. They conclude that the main influence on innovative performance is the strategic HR practices. Within the HR practices, the capacity to acquire, share and apply information are determinants of whether the organisation performs well in innovation.

Similarly, Akram et al. (2011) examined the relationships between knowledge management process and innovation process through extensive literature reviews. Key determinants of innovation were identified as Knowledge Transformation, Collaboration and Integration and Innovation (p.131) which highlights the important role individual employees play in the development of innovation on the organisational level through the diffusion of knowledge (p.132). Empirical evidence has also been provided in the study of relationships between transformational leadership, organizational learning, knowledge management, organisational innovation, and organizational performance (e.g. Noruzy et al., 2012). The use of the survey method in the work noted above emphasised the findings that organisational learning (i.e. the knowledge management processes) had positive effects on organisational innovation in manufacturing firms. This relationship was also supported by the inclusion of leadership which provides employees with the means to use knowledge effectively (e.g. developing competences in creating, acquiring, sharing, storing, and implementing knowledge). However, Noruzy et al. (2012) do not give

indication of the contribution of individual employees to the development of innovation in organisations. It is impossible to explore this through a quantitative design as this would not determine reasons for the relationships identified and therefore more qualitative methods have been used.

The knowledge management approach to innovation development has previously been explored qualitatively (e.g. Rasmussen & Hall, 2016). Such research has used the case studies to highlight knowledge management practices in relation to innovation. Research by Rasmussen and Hall (2016) highlights the complex nature of the organisations due to the changing customer needs, competitive pressures in the market and also technological change (Cavusgil et al., 2003). However, the longitudinal study carried out by Hall and Rasmussen (2016) served to explore processes of management innovation. The innovation highlighted here is that of the organisation collectively, not of individual employees within the organisation.

Knowledge management is also known to play an important role in the development of innovation as it enables the sharing and codification of tacit knowledge (Du Plessis, 2007, p.23). The sharing of knowledge is carried through the communication and interactions of employees. Knowledge sharing between employees can leverage expertise within the organisation (Ellinger & Cseh, 2007, p.446). The behaviour of knowledge sharing is a key element of innovative work behaviour development (and is also an information behaviour as noted in section 2.4.1.2 above). Empirical work from Akhavan et al. (2015) indicates, through a socio-psychological approach, that motivational factors encourage employees to share knowledge (e.g. reputation enhancement, knowledge as power, and enjoyment in helping others).

The sharing of knowledge to enhance innovative work behaviour is dependent on employees having the correct knowledge resources to be able to do so, and the interpretation of knowledge form employees (e.g. Nambisan et al, 1999). For example, Gressgård et al. (2014) carried out a series of interviews with employees, managers and union representatives of 20 organisations and found that systematic exploitation of knowledge resources within organisations (e.g. information and communication tools) enhances employee-driven innovation (2014, p.643). At the same time, organisations must provide employees with the means to share knowledge to enhance their own innovative work behaviour. For

example, organisations need to create a work context to support employees to utilise skills develop, provide an open culture to the transfer of knowledge (specifically external knowledge into the organisation). This knowledge blending (from external to internal knowledge helps employees to see the value of acquiring new knowledge and potentially dissemination throughout the organisation (2014, p.643). Evidence also suggests that this acceptance of knowledge use is also useful in the acceptance of innovations (e.g. Badilescu-Buga, 2013). However, employees must have appropriate skills for interacting with others in social networks (i.e. where information and knowledge may be acquired form) and taking advantage of the knowledge that the networking are able to share (Badilescu-Buga, 2013, p.910).

Through the analysis of the knowledge management literature, it is understood that knowledge sharing has many benefits in terms of innovation. This includes motivational factors to share information (e.g. reputation enhancement, power, and enjoyment in helping others). Knowledge sharing between employees can also help to leverage expertise within the organisation (Ellinger & Cseh, 2007, p.446) and can help employees in the acceptance of innovations (e.g. Badilescu-Buga, 2013). However, due to relationships with organisational learning, knowledge management work has centred on collective innovation processes and organisational innovation capabilities (Akram et al., 2011; Chen & Huang, 2007). This work highlights the importance of learning and knowledge sharing in the innovation process but fails to investigate the role of the individual employee in innovation development (i.e. innovative work behaviour), often focusing on the knowledge resources of the organisation (Gressgård et al., 2014).

The knowledge management approach has also been used as a focus for research relating to information behaviour (e.g. information and knowledge sharing). This can be done as part of a Community of Practice (CoPs) to leverage expertise in the organisation (Pattinson et al., 2016) and also the relationships with managers to align the views of the CoPs with the innovation views of the organisation (Swan et al., 2002).

2.4.1.4 Communities of practice and innovation in the workplace

Knowledge sharing processes as part of CoPs is a focus of knowledge management work. CoPs are defined as a group of people who share the same

concern or passion for something they all do and they learn how to do this better through interaction and communication with the group (Wenger, 1998). It is this shared way of doing tasks which visualises the joint enterprise within the community. This supports mutual engagement in the groups identify (Wenger, 1998). Such an identity is formed through the development of routines and resources, giving group members a sense of belonging within the community (Smith, 2003, p.2). This makes CoPs differ from other functioning groups (Davenport & Hall, 2002, p.181).

The interaction, communication and knowledge exchange processes in CoPs are linked with organisational learning as it enables the organisational to gain experience and create knowledge from working as a group. This then helps the organisations to learn and improve over time (Lave & Wenger, 1991).

It has been widely accepted that CoPs facilitate knowledge sharing, the generation of new ideas and diffusion (championing and implementation) of such ideas (Brown & Duguid, 1991; Coakes & Clark, 2005; Wenger & Snyder, 2000; Wenger et al., 2002).

As explored in section 2.4.3.1 on page 33, knowledge sharing is a key source for learning and innovative work behaviour development and individuals are at the heart of such knowledge. However, communities enabling individuals to create and share important knowledge are sometimes misunderstood in terms of how the community supports knowledge sharing from individual community members (Wenger, 1998, p.1). Lave and Wenger (1991) explored such communities in the development of CoPs (CoPs).

CoPs place emphasis on the learning people do together rather than the subject of learning itself, and develop outside of the social relationships and structures governing organisations (Devanport & Hall, 2002, p.172). Knowledge acquisition and learning is at the heart of social engagements presented in CoPs, often referred to as situated learning (Lave & Wenger, 1991). New members of a community draw upon socio-cultural practices of the group, transitioning through a process of legitimate peripheral participation. Legitimate peripheral participation involves new members of the community being given low risk tasks to begin the processes of embedding community goals into their own practice (Wenger, 1998). Full member status is given to group members

when they are able to engage in the process of learning and have fully embedded the socio-cultural values of the group into their own practice (Level & Wenger, 1991). Participation within the group then supports its members to learn from each other by seeking experience and problem solving together (Walker et al., 2013).

This process facilitates knowledge exchange amongst members and stimulates the collaborative learning process (Wenger, 2000). In turn, this helps the community to develop strategies to address the given task and co-ordinate ways of approaching the task (Pattinson & Preece, 2014, p.113-114). Individuals within the community then develop confidence from receiving valuable feedback from community (Davenport & Hall, 2002, p.187-188). The feedback and acquired knowledge can help individuals approach tasks within the community, or to external situations in terms of career advancement or personal reputation (Davenport & Hall, 2002, p.187-188). CoPs have therefore been used to improve organisational strategies in learning to provide support to the sharing of knowledge to enhance the learning process (Boud & Middleton, 2003). For example, the sharing of knowledge occurs more frequently when this is not a direct requirement of the role adopted (Davenport & Klahr, 1998, p.207). This therefore encourages knowledge sharing as part of an organisational culture may support individuals to learn in the workplace once the culture has been established in practice.

Early studies have explored the impact of CoPs on learning and innovation (e.g. Brown & Duguid, 1991). CoPs bridge the gap between learning and innovation by introducing a more rich, fluid and non-canonical view of the world (workplace) which then helps to update the organisation's non-fluid and canonical view with constantly changing workplace practice (Drown & Duguid, 1991, p.50-51). This helps to keep the organisations up-to-date with the changing economic landscape and encourages organisations to make the changes needed to cope (i.e. to try something new (p.51).

However, as noted by Brown and Duguid (1991, p.51), early researchers such as Daft and Weick (1984) view the community as a collective entity and do not view the individual employees as central to innovative practice (i.e. those who create and implement the ideas). Such researchers focus primarily on the interactions between the organisational and the environment, and often neglect

the idea that individual components (i.e. people) make up the community when exploring concepts further. This concern makes the study of CoPs and innovative work behaviour (or employee-led innovation) difficult due to the lack of differentiation between collective innovation (e.g. organisational innovation as noted by De Vries et al., 2015) compared to innovative work behaviour from individual employees and the processes or behaviours thy go through to innovate (see section 2.3.2 for a full definition of innovative work behaviour). Brown and Duguid (1991) provide ample discussion of the complexity of the definitions of learning and innovation in the workplace and emphasise that this conflict in definitions could lead to the core values and beliefs of the organisation to be opposite and conflicting.

There are many benefits of CoPs, including the influence of CoPs on innovation. Empirical studies demonstrate the impact of CoPs on innovation (see Bertels et al., 2011; Patinson & Preece, 2014). For example, earlier studies by Swan et al. (2002) suggest that the relationship between managers and CoPs play an important role in the management of innovation. Using a case study of a manufacturing company, Swan et al. (2002) demonstrate that CoPs were used by management to mobilise the innovation process and align the agendas of the CoPs with that of the organisation. When the management adopted the innovation approach it allowed easier harmonisation and acceptance of ideas created and implemented (p.493).

Through the analysis of key literature relating to CoPs and innovation, Pattinson et al. (2016) highlighted four main ways in which CoPs enable and constrain innovative capabilities of organisations. However, only two focus on the role of the individual employee as part of the community of practice. CoPs provide venues for practice based-learning. This learning facilitates the sharing and management of knowledge (between individual people) and acts as a mechanism to enhance innovative capability of the organisation (2016, p.6). This emphasises the importance of knowledge sharing as this is seen as important in the development of innovative work behaviour (see above). CoPs are purposefully developed to stimulate collaborate activities between individual employees. This enhances the organisational innovative capabilities by supporting employees to share information and knowledge or seek advice when needed when creating and implementing new ideas in the workplace. This is in

line with the knowledge sharing literature detailed above (e.g. Gressgård et al., 2014).

The collective nature of CoPs was also emphasised in the findings of work by Gressgård et al. (2014). For example, the groups of employees (collectively) provided collaborative environments which then supported the development of collaborative relationships built on trust and reciprocity. These enhanced innovative capabilities by acting as socio-contextual enablers of generating social capital through the promotion of knowledge exchange. However, CoPs were (collectively) platforms for professionals which could actually inhibit innovative capability if the group (collectively) use the political power they have.

Research by Gressgård et al. (2014) was in line with that carried out by Soekijad et al. in 2004, over ten years earlier. Soekijad and colleagues provide evidence for the facilitation of innovative work behaviour through learning through CoPs. Through a case study of a Community of Practice multinational organisation in the Netherlands, Soekijad et al. highlighted the importance of collaborative spaces within CoPs to develop new ideas and exchange ideas. Study participants reported that they had learned about perspectives of others (e.g. values, opinions, concerns and issues) as well as further detail about their joint practice. Form this, the participants were forced to evaluate their own reference frames and adapt these to suit others through processes of confrontation of ideas and cooperation between group members. Findings suggest that, when participating in CoPs, employees may be able to learn about the opinions of others. However, at the same time they may be required to evaluate their own viewpoints in order to agree on the creation and implementation of new ideas (i.e. if their own views do not fit with that of the group).

As demonstrated in the literature review above, there are a variety of factors, related to the information science domain, that influence the development of innovative work behaviour, either as enhancers or inhibitors. These factors are summarised in the table below.

Table 4: Enhancers and inhibitors of innovative work behaviour from Information Science literature

Information Science Literature	
Information Literacy	
Enhancers	**Inhibitors**
- Capacity to make judgement about information use - Make decisions on information behaviours needed - Sets context for information needed for learning and innovation - People act as interactive information sources to question information	- Information overload - Difficulty in navigating information sources
Information behaviours	
Enhancers	**Inhibitors**
- Knowledge and information sharing between employees - Information seeking behaviours	- Knowledge shared in unsuitable method - Difficulty in navigating information sources
Knowledge management	
Enhancers	**Inhibitors**
- Knowledge management practices within the organisations to support knowledge sharing - Knowledge sharing and communication through CoPs	No suitable knowledge management practices in place

2.4.1.5 Approaches used in information science work on innovation in the workplace

There are some methodological considerations to note when reviewing Information Science literature on innovation in the workplace with reference to the type of innovation studies and the types of methods used.

The analysis of the literature has revealed some concerns over the types of innovation studied. For example, some research (e.g. Pattinson et al., 2016) focus on collective innovation processes in the organisation rather than innovative work behaviour processes which are studied in the thesis. Additionally, there are many specific types of innovation. Researchers often choose a particular type of innovation to study due to the need for particular research highlighted in prior work and demand to improve certain typed of innovation in the current economic market (e.g. Service Innovation studied by Zulkeplia et al., 2015, and Management Innovation studied by Rasmussen & Hall, 2016). This makes the comparability of innovation studies of different innovation types difficult due to the differences in definition and conceptualisations of the types of innovation focused upon.

Comparability of study findings can also be difficult if the methodological approaches are not the same. For example, some innovation studies use a quantitative approach such as data collection by online questionnaire (Ortega-Egea, et al., 2014), some use a qualitative approach such as data collection by qualitative interviews (Gressgård et al. 2014) and some studies use both (Linke & Zerfass, 2011). The use of qualitative approaches emphasises the complexity of innovation in definition, and the multiple influencers that may be present (e.g. the opinions of employees). However, the structure of the quantitative approach overcomes this by giving a specific definition of the concepts studied. The case studies discussed in the thesis reflect the findings of the analysis of the literature review and adopt a multi mixed-methods approach. To this end, both qualitative and quantitative methods are used to reflect the diversity of the methods found in the literature (see Chapter 4 for details of the full methodology).

2.4.2 Organisational contexts for the development of innovative work behaviour

The context of the organisation is also critical in the development of innovative work behaviour. Such enhancement of innovative work behaviour can be based on the behaviour with and use of information in the workplace (see section 2.4.1.2 on page 30). However, organisational context is also important. The organisational context provides the foundations for individuals to be able to learn at work and develop required behaviours to enhance innovative work

behaviour (Lundkvist & Gustavsson, 2018). Therefore, presented in this section is an analysis of the literature pertaining to the organisational contexts which support the development of innovative work behaviour. These are: (1) a strategy for innovation; (2) the organisational culture; (3) leadership within the organisation; (4) technical infrastructure and; (5) training.

2.4.2.1 A strategy for innovation in the workplace

A strategy is a set of manoeuvres to overcome an 'enemy' (Eden & Ackermann, 1998). In the organisational setting, the enemy is the risk of not achieving organisational targets, goals and achieving economic growth against competitors. Strategies are developed and applied at various levels, relating to the whole organisation or specific products (Andrews, 1980). Strategies can also be applied to enhance innovation within organisations. For example, some researchers (e.g. Casey & Goldman, 2010) have explored the ability for employees to think strategically (i.e. the ability to think about, assess and plan actions towards a future, which can help to make decisions towards the future goals). However, such work has focused on the strategic thinking of managers and lacks focus on the overarching strategy developed for the whole organisation. Other work has centred on strategy as a means for employees to become involved in innovation and change (e.g. Åmo & Kolvereid, 2005). Additionally, focus of strategy related research is often on the learning of such strategies, or how strategies can influence learning (as opposed to innovation). More recently, researchers have focused on innovation strategies (e.g. Prajogo, 2016). This work has recognised the need to focus on innovation specifically, however, the line of work (e.g. Prajogo, 2016) has often centred on innovation as a competitive strategy rather than a strategy to enhance innovation from employees (e.g. Prajogo, 2016).

Innovation studies have acknowledged the effectiveness of innovation as a competitive strategy particularly for organisations with a product innovation focus (e.g. Barney, 2001; Jansen et al., 2006; Katila & Shane, 2005; Tsai &Yang, 2013). The findings of the studies noted here also indicate that the success of innovation strategies is also influenced by other environmental factors such as culture and the infrastructure of the organisation. The focus of the following sections is therefore of the environmental factors within the organisations that may enhance innovative work behaviour.

Organisational strategies are developed in order to address a concern, such as to maximise the development of innovations within the business to maximise performance in context (Prajogo, 2016, p.247). More importantly, organisations develop strategies to help employees and organisations achieve long term goals and create a plan of actions or interventions directed towards achieving that goal (Casey & Goldman, 2010, p.171). This can have a specific focus (e.g. innovation) or it can be more general. However, organisations must also create a culture compatible with the strategy in order to promote the strategy to employees (Rude, 2014, p.130-131). In the next section, the role of organisational culture in the development of innovation in discussed, and then innovative work behaviour more specifically.

2.4.2.2 Organisational culture and innovation in the workplace

Learning to enhance the capacity to innovate (as a collective organisation) can be influenced by organisational contexts, in terms of both organisational culture (Naranjo-Valencia et al., 2011, p.56) and strategy (Ramírez et al., 2011, p.250-251). Organisations must also create a culture compatible with the strategy (Rude, 2014, p.130-131). The culture comprises assumptions on how the organisation ought to be and incorporates customs and skills required on the individual and collective levels (Omerzel, 2016, p.97). The focus is often on how people should behave.

There has been an abundance of work on the role of organisational culture in the development of innovation (e.g. Damanpour, 2006; Harbi et al., 2014; James, 2005; Martins & Martins, 2002; Martins, 2003; Naranjo-Valencia et al., 2011; Wei et al., 2012). This has focused on group innovation (e.g. Naqshbandi & Tabche, 2018) as well as the development of innovative work behaviour (e.g. Shanker & Bhanugopan, 2014; Stoffers et al., 2015).

Organisational culture lies at the heart of innovation (Tushman & O'Reilly, 1997). The socialisation processes in organisations help employees to understand the kinds of behaviours that are acceptable and the ones that are not. Additionally, the basic values assumptions and beliefs that are established as part of the culture become visible in the behaviours and activities of employees and are reflected in policies, practices, structures and procedures (Tushman & O'Reilly, 1997, p68).

Early innovation work has acknowledged the importance of building a culture to foster innovation (Frohman, 1998). However, Frohman (1998) noted that the collective culture, and managers with the organisation, need to respect individual employees and the ideas they create in the workplace, otherwise this could hinder the impact of culture and innovation from the employees (Frohman, 1998, p.11).

Later work has explored the specific type of organisational culture needed to enhance creativity and innovation from employees. In the development of a conceptual model of organisational culture on innovation, Martins and Martins (2002) found that several factors influenced the development of service innovation. By using a quantitative questionnaire to measure potential concepts in the organisational culture, the strategy of the organisation was deemed important as this helps with the integration of the core values of the organisation and the knowledge management of the values (see section 2.4.2.1 on page 41). The work environment supports creativity and innovation (i.e. the provision of suitable resources and the integration of goals and objectives). Additionally, certain behaviours are encouraged to support innovation, such as idea generation, risk taking and decision making. The management of the organisation also helps to facilitate these by providing adequate support and resources. However, this study was conducted in service-innovation orientated organisational and may not be comparable to organisations with a focus on other innovation types. This helps to justify the need to study innovation from employees more generally (although the diversity of the terms creativity, innovation and culture are acknowledged in Martins and Terblanche, 2003).

Likewise, other work has been carried out in specific work contexts. Harbi et al. (2014) carried out an exploration of innovation culture within Tunisian IT firms. They found that two main elements of the organisational culture impact innovation from employees: (1) the communication between different people and groups can reduce the disconnectedness of ideas created and; (2) the socialisation of knowledge and learning can help employees to share knowledge. However, to enhance the culture further, there is the need to extend the transfer of knowledge to outside workplace contexts (Harbi et al., 2014, p146).

Harbi et al. (2014) acknowledge the limitation of studying innovation in multiple contexts and justify their methodological design with the use of multiple case studies. The use of multiple case studies enables the use and application of existing concepts without inhibiting the detection of unique case study characteristics (p.137).

Later work has also highlighted the importance of organisational culture on the development of innovative work behaviour (e.g. Shanker et al., 2017; Shanker & Bhanugopan, 2014; Stoffers et al., 2015). These studies identify that the environment for innovation can encourage employee innovative work behaviour. For example, Shanker and Bhanugopan (2014) demonstrated that innovative work behaviour of employees (i.e. idea creation, idea promoting and idea realisation) is impacted by the organisational climate through the creation of a quantitative structure model. The model identified that organisational climate consists of nine dimensions (including challenging and involvement in idea creation, idea support, debate, trust, risk and conflict). The findings revealed that debate and idea support significantly affected employees innovative work behaviour. However, further work is required to explore the specific reason for this, as this is not possible to explore using the quantitative approach of Shanker and Bhanugopan (2014).

Other work identifies the need to specify culture types that may influence innovative work behaviour. For example, in the case study approach used by Stoffers et al. (2015), employees were able to identify the culture they preferred in terms of innovative work behaviour development (i.e. a family culture). However, when carrying out quantitative significance testing on the concepts chosen by employees (i.e. the current culture versus preferred cultures like family culture), Stoffers et al. found no significant relationships between family culture and innovative work behaviour. This highlights the complexity of both organisational culture and innovative work behaviour as well as the importance of interpretation of the terms. Additionally, preferences of employees towards a certain culture type does not necessarily reflect the actual culture in place. In this case, the participants suggested that they preferred a family-type culture whereas there was a market culture in place (directed towards organisational goals of the organisation).

Researchers often acknowledge that other factors may play a role in how organisational culture influences the development of innovation. For example, the role of information sharing across the organisation (see section 2.4.1.2 on page 30) impacts how employees perceive the culture, and this can influence employee innovation (Wei et al., 2013). One of the most common influences of organisational culture on the development of innovative work behaviour is leadership. Leadership is an import part of organisational culture when promoting innovative work behaviour (e.g. Frohman, 1998; Martins & Martins, 2002; Lundkvist & Gustavsson, 2018). This work highlights the interrelationships visible: the leaders are there to help to promote the culture but at the same time supports employees to innovate (e.g. think of new ways of doing things). The next section of this literature review therefore focuses on the role of leadership in the development of innovative work behaviour.

2.4.2.3 Leadership and innovation in the workplace

Leadership is known to influence many elements of the workplace, including the organisational culture (Naqshbandi & Tabche, 2018; Rosing et al, 2011; Zacher et al., 2015). The main impacts of leadership lie in the behaviour and actions of leaders themselves (Northouse, 2017). The values of leaders are often transmitted to other employees in their actions. These actions can help employees understand work and success (Bryman, 2013). For example, leadership can foster information literacy (as noted in section 2.4.1.1 on page 28 of this review) in the workplace (e.g. Ahman & Widén, 2018). In turn, this can influence innovation from employees. Therefore, in this section, literature on the influence of leadership on the development of innovative work behaviour is discussed. This includes the impact leaders have on innovation more generally and the individual behaviours of the employees they manage.

Leadership can impact innovation on the collective level. This is because the social nature of the culture and climate that employees are part of and sometimes requires a leader to take charge (Elenkov & Manev, 2005). Leaders can shape the way in which the organisational culture is developed and support employees to behave in suitable ways (Jung et al., 2003; Tsiu et al., 2006). Jung et al. (2003) showed the power that leaders have with the study of transformational leadership using a sample of thirty-two managers from three Taiwanese companies. The findings revealed that leaders, through their style of

leadership style, empower employees to innovate and facilitates the culture expected by the organisation. This encourages employees to innovate and enhances the organisational innovation. Transformational leaders work with teams of employees to identify change needed and help to create a vision (culture) to support employees through change inspiration. However, this requires support from committed members of the group who serve to encourage others to change too (Martins & Martins, 2002; Sarros et al., 2008). Similarly, Elenvok and Manev (2005) emphasised the sociocultural context in organisational innovation. However, it was suggested that leadership needs to come from the top level of the organisation to influence strategic innovation. Improvements in the strategy can then support individual employees to develop innovative work behaviour. Leaders are also able to support employees through larger organisational changes and innovations. This is effective if the support is from top management within the organisation (Damanpour & Schneider, 2006; Kavanagh & Ashkanasy, 2006).

A review of the literature by Mumford et al. (2002) suggests that creative leadership is required in order to lead creative and innovative people. This is because creative employees hold a certain degree of autonomy in their work and professionalism, and this is required from the leader too (Mumford et al., 2002, p.737). However, it is then argued that this is not always the case and that characteristics of the leader (e.g. technical expertise and creativity) are important when leading. This is because the behaviours of leaders can include intellectual stimulation for employees as well as support and involvement. These behaviours help employees to express their creative capacities (Mumford et al. 2002, p.738), an important skill in the creation of new ideas. Leaders help to generate resources to be used in the creation of new ideas (Mumford et al,. 2002). They also help during the development of ideas (e.g. helping employees to evaluate their ideas), support employees to champion the ideas and integrate ideas with the needs of the organisational (e.g. Mumford, 2000a). These behaviours to help to create conditions where employees can create new ideas and progress through the process of implementing the ideas with support from leaders. Cardinal and Hatfield (2000) suggest that leaders are potentially the most critical of ideas and the potential of success.

More recent research indicates that specific leadership behaviours influence employee behaviours. Through the analysis of the literature, it was revealed that several leadership behaviours influence the creation of ideas and the application of such ideas (see Table 5 for a full summary of the behaviours).

Table 5: Leadership behaviours in relation to innovative work behaviours of employees (taken from de Jong and Den Hartog, 2007, p.49)

Behaviour	The behaviour consists of the following elements:	Idea generation	Idea application
Innovative role modelling	Being an example of innovative behaviour, exploring opportunities, generating ideas, championing and putting efforts in development	X	X
Intellectual stimulation	Teasing subordinates directly to come up with ideas and to evaluate current practices	X	
Stimulating knowledge diffusion	Stimulating open and transparent communication, introducing supportive communication structures like informal work meetings	X	
Providing vision	Communicating an explicit vision on the role and preferred types of innovation, providing directions for future activities	X	X
Consulting	Checking with people before initiating changes that may affect them, incorporating their ideas and suggestions in decisions	X	X
Delegating	Giving subordinates sufficient autonomy to determine relatively independently how to do a job	X	X
Support for innovation	Acting friendly to innovative employees, being patient and helpful, listening, looking out for someone's interests if problems arise	X	X
Organising feedback	Ensuring feedback on concepts and first trials, providing feedback to employees, asking customers for their opinion		X

Behaviour	The behaviour consists of the following elements:	Idea generation	Idea application
Recognition	Show appreciation for innovative performances	X	X
Rewards	Providing financial/material rewards for innovative performances		X
Providing resources	Providing time and money to implement ideas		X
Monitoring	Ensuring effectiveness and efficiency, checking-up on people, stressing tried and tested routines (negative relationship)	X	X
Task assignment	Providing employees with challenging tasks, make allowance for employees' commitment when assigning tasks	X	

De Jong and Den Hartog (2007) revealed thirteen behaviours that influence innovative work behaviour. Three of the leadership behaviours influenced idea application only (i.e. intellectual stimulation, simulating knowledge diffusion and task assignment) and three behaviours influenced idea application (i.e. organising feedback, rewards and proving resources). The remaining seven behaviours influences both idea implementation and application. This study highlights the importance of studying influences on the specific processes of innovative work behaviour. For example, employees may need to be given information to address certain tasks and this could trigger idea generation (e.g. if they are explicitly instructed to complete a task). At the same time, knowledge difficulties (e.g. sharing knowledge between colleagues initiates discussion and encouraged employees to discuss create ideas further. The findings from the study also highlight the additional contextual variables involved in the development of employee innovative work behaviour. For example, the leaders are able to provide resources to implement ideas. However, it can be argued that it is the responsibility of the employees to use the resources in the application of the innovation. It was out of the scope of the work by De Jong and Den Hartog (2007) to explore employee behaviour (e.g. how they act with provided resources). Therefore, the sections that follow review literature on the

impact of resources and infrastructure on innovative work behaviour development.

2.4.2.4 Technical infrastructure and innovation in the workplace

The introduction of smart-working practices is evident within the literature in support of workplace innovation (Hamel, 2007). This type of strategy allows employees to have increased flexibility in the choice of the working spaces, time and tools, and other infrastructure elements that allow employees to accomplish given tasks (Gastaldi et al., 2014).

The provision of appropriate infrastructure to foster workplace learning is important to enhance workplace learning and innovation. For example, the provision of digital tools and technology enables the sharing of knowledge both inside and outside of the organisational context (Za et al., 2014, p.1024). Explored in this section is the use of digital tools used to facilitate learning by encouraging online interactions.

Online or digital communication tools have changed the way individuals interact in the workplace and address problems they face (Ferincz & Hortoványi, 2014, p. 848). For example, accessing information via online sources ensures knowledge can be shared around the organisation, and expertise of experienced individuals can be understood and used (Andersson, 2006, p. 677; Ravenscroft et al., 2012, p.237). Digital platforms and information infrastructures provide basis for this communication and knowledge sharing (Za et al., 2014, p.1024; García-Peñalvo et al., 2012; Ravenscroft et al., 2012). Knowledge sharing can then link external and internal information sources and encourage knowledge exchange between the two (Yoo et al., 2010). From this exchange employees can innovate.

The provision of digital tools had been demonstrated to be a factor in the enhancement of innovative work behaviour, however, providing the physical space to encourage offline interactions is also important. More appealing workspaces are those that promote collaboration in work practices (Oksanen & Ståhle, 2013, p.815). This then encourages communication, interactions and knowledge sharing amongst people involved (Nonaka & Takeuchi, 1995; Senoo et al., 2007). Communication within a shared space enables employees to exchange information, interpreting and analysing it with others (Luoma-aho & Vos, 2010; Oksanen & Ståhle, 2013, p.821). Structured space is therefore

important in learning and innovation within the organisational context as it enables ideas to be analysed and interpreted from various perspectives (Auerhammer & Hall, 2014). This is because learning is viewed to be collective and collaborative, so having a physical environment that fosters the ability to collaborate and encourages learning of innovative behaviours to take place (Nordfors, 2009).

Therefore, having a physical space to enhance collaboration is a factor involved in innovation behaviour development, specifically when creating new ideas (Haner, 2005; Oksanen & Ståhle, 2013, p.821). The emphasis on social capital from participation ensures that knowledge sharing is emphasised within the organisational context and developed within or between individuals involved (Brouder, 2012; Racherla & Hu, 2010). In turn, this impacts on areas of organisational process such as learning and innovation development whereby social capital can lead to increased trust and contribute to a sustainable innovation system. Therefore, fostering a culture for collaborative learning may support such processes. Providing a physical space for collaboration means employees can support each other and disseminate learning techniques for skill enhancement to current and future employees (Marsick & Watkins, 2003, p.135). Employees can also have a space away from distractions to think and reflect on actions which can trigger innovation from the learning process (Martens, 2011, p.64).

2.4.2.5 Training and innovation in the workplace

Training and development policies and structures are required in order to ensure appropriate opportunities are available to employees (Smith, 2000, 2001). These opportunities must meet individual and organisational needs in terms of developing skills required (Clarke, 2005, p.190) and must also enable the practice of learned skills outside of the training context (Clarke, 2005, p.190). Improving training activities within the workplace is essential for maintenance of knowledge and enhancement of skills and is considered a strategic tool for organisational success (Mamaqi, 2015, p.812). New knowledge can be filtered through the organisation by the provision of external training opportunities if employers hold a culture that values knowledge (Ahlgren & Tett, 2010, p.20). Therefore, organisational culture in support of training is important. Employers who present more restrictive cultures of

learning and development opportunities inhibit the workplace learning process by inadequately providing opportunities within the organisations (Ahlgren & Tett, 2010, p.26). In turn, employee's progress depends highly learning done from knowledge gained through training opportunities offered (Fuller & Unwin, 2003, p.42).

Training influences innovative work behaviour from employees (e.g. Lundkvist & Gustavsson, 2018, Messmann & Mulder, 2011; Bos-Nehles et al., 2017). Lundkvist and Gustavsson (2018) explored the implementation of a workplace competency development programme on learning and innovation from employees. The findings show that the activities and support provided as part of the programme triggered innovative learning and helped to foster innovative work behaviour (employee-driven innovation) when management leadership skills and a suitable learning environment were present (2018, p.60). However, the activities given to employees were affected by the amount of allocated time for formal training, which did vary between organisations in the study. This is a concern reflected in a study by Messman & Moulder (2011). Even when opportunities to develop innovative work behaviour are present, the needs and goals of employees are pivotal for the opportunities to be recognised and undertaken successfully (i.ee for the training to trigger innovative work behaviour).

The impact of training on innovation (e.g. delivered in the form of workshops) is also evident in more recent work (e.g. Hall et al., 2019). In the work by Hall et al. (2019, in press), participants identified that they had applied learning from the workshop to innovate in the workplace (e.g. adapting service delivery, and improvements to user systems). However, as noted by Hall et al. (2019, in press), it is difficult explicitly state that participation in workshop activities directly impacted innovation from participants. This is due to the other factors in the workplace which may play a role in employee-led innovation.

Other studies suggest training delivery as part of a Human Resource strategy (e.g. Knol & van Linge, 2009; Pratoom & Savatsomboon, 2012; Zhang & Begley, 2011). In these studies, innovative work behaviour was successfully influenced as consequence of the training and development activities. Some studies focus on the knowledge available in training and the process of innovative work behaviour engagement from employees (Knol & van Linge,

2009; Pratoom & Savatsomboon, 2012). The knowledge transfer can also act as a mediator to the development of innovative work behaviour through training and development (Bos-Nehles et al., 2017, p1238). The concept of human capital is emphasised here where training and development can help to increase the skills, abilities and knowledge that employees use in innovative work behaviour. The concept of human capital is also discussed in work by Blau (1964a) who suggested that innovative work behaviour is a social exchange phenomenon (i.e. the training and development by the organisation can be reciprocated by positive attitude and behaviours that lead to innovative work behaviour and the organisational impacts of such behaviour).

From the analysis of the literature above, it can be suggested that the work on organisational context and innovative work behaviour has focused on four main areas: (1) the culture of the organisation; (2) leadership; (3) training and; (4) infrastructure provided by the organisation. Within the literature analysed above, there are references to how organisational strategy influences innovation, but the strategy work has centred on getting employees involved in innovation activities rather than developing innovative work behaviour specifically (Prajogo, 2016). At the same time, much work has been carried out on organisational culture (e.g. Damanpour, 2006; Forhamn, 1998; Harbi et al., 2014; James, 2005; Martins & Martins, 2002; Martins, 2003; Naranjo-Valencia et al., 2011). However, some work has focused on collective innovation throughout the organisation (e.g. organisational innovation, marketing innovation and process innovation). This makes comparability of the studies difficult as they lack focus on how employees themselves innovate. Studies also often investigate multiple concepts in one study. For example, Frohman (1998), Martins and Martins (2002) and Lundkvist and Gustavsson (2018) all explore the role of leadership in the development of innovative work behaviour. However, this work does not focus on culture specifically and often note the role of leadership as promoters of the culture whilst analysing the application of study findings (e.g. Martins & Martins, 2002, acknowledge the role of culture and leadership in the conclusions to the work). This also makes study comparability difficult as each individual study highlights a series of factors that influences the main concept studies. The work on leadership has centred on the development of group innovation as well as employee-driven innovation. There are also several types of leadership identified in the work above including Transformation Leadership

(e.g. Mumford et al., 2002) and Top Management Leadership (e.g. Kavanagh & Ashkanasy, 2006). Little is known as to whether specific types of leadership influence the development of innovative work behaviour and this again makes cross-study comparison difficult.

From the analysis of the literature above, it can be seen that the provision of training influences innovative work behaviour development (e.g. Lundkvist & Gustavsson, 2018, Messmann & Mulder, 2011; Bos-Nehles et al., 2017). It can be argued that training can either be provided independently, or as part of a Human Resource Management strategy. However, some work has highlighted other factors that come into play in the success of training (e.g. the relevance of training to job goals, and the impact of leadership in the promotion of training for employees). To date, there is no work to explore the impact of innovation-relevant training on the development of innovative work behaviour.

As demonstrated in the literature review above, there are a variety of factors in the organisational studies domain that influence and inhibit the development of innovative work behaviour. These are summarised in Table 6 below.

Table 6: Enhancers and inhibitors of innovative work behaviour from the organisational context

Organisational context from organisational studies literature	
A strategy for innovation	
Enhancers	**Inhibitors**
• Enhances innovative work behaviour of strategy gives instructions on expected employee behaviours	• Limits innovation if not communicated to employees effectively
Organisational culture	
Enhancers	**Inhibitors**
• A collective culture helps to promote the creation and sharing of ideas • The culture helps to knowledge share and communicate between employees	• A risk averse culture inhabits innovation
Leaders and leadership	
Enhancers	**Inhibitors**
• Leaders promote the desired culture • Leaders help to provide resources for innovation • Leaders set examples to employees as to how they should behave • Leaders reward desired behaviours (e.g. collaboration, idea creation and knowledge sharing)	• If leaders do not communicate with employees, key message may be lost
Technical infrastructure	
Enhancers	**Inhibitors**
• Physical space to promote communication and knowledge sharing • The use of digital tools for information sharing and communication	• No physical space to collaborate in the workplace

Organisational context from organisational studies literature	
Training	
Enhancers	**Inhibitors**
• Training to develop skills and competencies to use in innovative work behaviour • Training to enhance knowledge	• A lack of training opportunities prevents skill development

2.4.2.6 Approaches used in organisational context on innovation in the workplace

Some concerns have arisen from the analysis of the literature above. The concerns pertain to the use of one sample or context within certain studies (e.g. Lundkvist & Gustavsson, 2018). These studies emphasise the complexity of the concepts, but simultaneously acknowledge the lack of generalisability to other workplace contexts. At the same time, differences in sectors are studied. The differences between innovation in public and private sectors are noted by Basu (2017). These differences are also noted in a technical report by Halvorsen et al. (2005) and Martin (2014). Differences in innovation relate to the strategies and policies in place in the organisations, and the decision making processes in place. It is sometimes assumed that public sector organisations and less innovative than private sector organisations. The innovation literature is large and diverse (Fagerberg et al. 2004) which leads to different terminology of innovation study in the public and private sectors being used (Halvorsen et al. 2005, p.23). The influencers of innovation in public and private sectors may therefore differ because of the differences in knowledge use, skills, the use of technology and the access to sources of finance. Additionally, this is influenced by the state of the market and vision of market potential (relating to marketing strategies put in place), the legal and regulatory systems, and the various interactions with suppliers, collaborators and users of the organisation (Halvorsen et al. 2005, p.23). These complexities are recognised in the choice of case study organisations in the thesis (see sections 4.5.7 on page on 112, 4.5.8 on page 117 and, 4.5.9 on page 120).

The methodological approaches used in studies must be considered when exploring comparability of the work. For example, some innovation studies use a quantitative approach such as data collection by online questionnaire, often to test a conceptual model (e.g. Naqshbandi & Tabch, 2018), some use a qualitative approach such as data collection by qualitative interviews (De Jong and Den Hartog (2007) and some studies use both. This highlights the complexity of the terms used as well as the multiple factors that can influence the development of innovative work behaviour. This is exemplified by the works of Martins and Martins (2002) and Martins and Terblanche (2003) who noted the inter-relationships as part of the study justification. Although the use of different methodological approaches makes some study comparison difficult, the specific purpose of each study helps to justify the use of the approach (e.g. quantitative approaches are used to test conceptual models statistically, and qualitative approaches are often used to explore reasons for patterns that emerge in data. The methodological approaches used in the studies above are reflected in the choice of methodological approach in this research (see Chapter 4 for the full methodology).

2.4.3 Individual skills and abilities for the development of innovative work behaviour

In section 2.4.2 literature was presented as to the influence of the organisational context on the development of innovative work behaviour. Some researchers have also highlighted the interplay between the organisational context and the skills, abilities and competencies of the employees themselves (e.g. Lundkvist & Gustavasson, 2018; Siddiqi, 2015). The focus of this section is therefore of the individual competencies, skills and abilities of employees in the workplace.

The skills and abilities of employees is an area explored in terms of innovative work behaviour. This has been in competence development (e.g. Lundkvist & Gustavasson, 2018). However, much of the previous research has focused on the importance of integrating formal development activities with daily work activities to help to improve the competencies of employees within the organisation (Ellström 2011). This research does not explore how such competency development may lead to that development of innovative work behaviour. Instead, it places strong emphasis on the internal context of the organisation, and the production of a suitable workplace environment for

learning rather than the development of employee behaviour (Fuller & Unwin, 2011). The workplace environment does play an important role in learning. For example, work tasks, managerial support, competence development strategies and social interactions (Evans et al. 2006; Fuller & Unwin 2004). However, the focus of this research is the provision of a suitable environment for learning and to that of innovative work behaviour from learning. There is therefore the need for further work on how learning (e.g. activities in support of learning) can support innovative work behaviour from employees (Ellström 2010a; Gustavsson 2009).

Some research has focused on employee resources. Resources such as competencies and problem solving abilities can facilitate innovation when innovation-related activities are carried out in everyday workplace practice (Billett 2012; Ellström 2010a; Eriksson 2014). At the same time, employees' individual dispositions (e.g. willingness or ability to participate in learning and innovation activities) means that some employees are likely to take part in activities and some employees are not (Gustavsson 2012). Unknown is how the specific skills and abilities of the employees influence the specific stages of innovative work behaviour (i.e. the recognition of the need to innovate, creation of ideas, and championing and implementation of ideas).

Despite a lack of evidence on the influence of specific skills and competencies of employees on innovative work behaviour development, the behaviours of employees have been explored. For example, the interactions of employees, not assigned to specific tasks, acts as an initiator of generating and implementing new ides in the workplace (Høyrup et al., 2012, p.8). Ellström (2010a, 2010b) suggests that innovations can occur informally, often spontaneously, and in an unplanned manner. These can also occur from more formal and structured activities (Ellström, 2010a). For example, regular and routine tasks can be completed out of the prescribed manner and this can result in new knowledge on how to change work practices. To apply this knowledge to practice, the knowledge must be made explicit ad demonstrated within the new work practices (Ellström, 2010a). Billet (2012, p.94) also suggests that the innovative practices are employee driven as it is the workers who initiate and engage with the tasks who confront new challenges and response to new tasks they face.

Sharing knowledge on new methods of working (i.e. ideas created) can encourage others to behave innovatively (see section 2.4.3.1 on page 30). The information and knowledge shared relies heavily on the ability of employees to communicate well.

Early work on innovation has exemplified the importance of communication (i.e. Communication is the words people understand through interaction with others in order to exchange information, Zulkepli et al., 2015, p.438) to innovation (e.g. Ryan & Gross, 1943). This importance of communication was later expanded to work on the adoption on diffusions of innovation (e.g. Rogers, 1962) and to different types of organisational innovation (e.g. Zulkepli, et al., 2015). However, the understanding of human communication process has advanced and the conceptualisation of communication within process of innovation has changed (Leeuwis & Aarts, 2010, p.1). Leeuwis and Aarts, (2010, p.2-4 provide a summary of the changing views and conceptual models of communication within the innovation literature. This highlights the complex definitions of innovation within the literature (2010, p.2) as well as the differences in approaches used for communication studies (2010, p.4). Leeuwis and Aarts (2010) note that communication helps to reorder and reconfigure relationships that happen in the multiple networks involved in innovation (2010, p.4). In addition, research is required to explore communication as a
means to transfer and effectuate knowledge and innovation' (2010, p.4). Therefore, research should explore at the process of innovation as an outcome of the social interactions that take place.

There are three communicative strategies understood to support innovation. These relate to: (1) network building; (2) supporting social learning and; (3) dealing with dynamics of power and conflict (Leeuwis & Aarts, 2010, p.9). The social learning has demonstrated to be particularly important in the process of employee-led innovation (Lave & Wenger, 1991) as well as the exchange of ideas and knowledge through networks. This is because communication leads to the exchange of ideas in the workplace. The networking can facilitate this exchange and the social learn process allows for the reflection and adaption of ideas during the processes of idea creation and implementation.

Several empirical studies have emphasised the importance of communication in innovation (e.g. Linke & Zerfass, 2011; Messman, 2011, p.1). Linke and Zerfass

(2011) used a mixed method approach to explore the relationships between communication, innovation culture, and the adoption and implementation of innovation philosophy. Analysis of qualitative interviews and a quantitative online questionnaire, with communication and human resources managers of a pharmaceutical firm revealed that two-way models of communication are suitable for the creation, implementation and dissemination of innovations in the workplace. The communication allows managers to provide the means to support employees to innovative through an innovation environment. In addition, some communication tools created awareness, understanding, acceptance and action (towards innovation). For example, tools such as staff meetings help employees to act towards innovation. However, the varied nature and suitability of communication in different contexts was highlighted (p.344). Therefore, communication may only be effective if the context of the innovation from employees is evaluated and the communication methods are adapted to suit the context and audience. The effect of the communication of mangers on employee behaviour is also evidenced elsewhere (e.g. Dasgupta et al., 2012).

Ortega-Egea et al. (2014) explored communication and knowledge flows as determinants of innovative work behaviour through the quantitative analysis of a questionnaire distributed to employees of five Spanish organisations. The findings revealed that, the greater the communication and knowledge flows among employees, the greater their orientation to innovation will be. Knowledge flows and communication are predictors of innovation orientation (i.e. perception and support for change and creativity and, the assessment of risk from new creations). However, care must be taken during the interpretation of the findings. Although employees were the respondents to the questionnaire, innovation orientation is a collective term used to express innovation potential of the organisation as a collective entity. Therefore, the questionnaire measured the innovative attitudes of the employees towards innovation, which may not directly represent the actual behaviours of employees sampled. That said, the research adds to the evidence on the literature of the positive effects of knowledge transfer and workers' innovation orientation (e.g. Brökel & Binder, 2007; Mayfield & Mayfield, 2004).

Work from the psychology domain has explored the influence of personality on innovative work behaviour development (e.g. Woods et al., 2018). Work by

Woods et al. (2018) suggests that openness and conscientiousness are the main predictors of innovative work behaviour development (Baer, 2010; Baer & Oldham, 2006; George & Zhou, 2001; Madjar, 2008). Openness is positively related to innovative work behaviour development because those who are more open are more flexible in thinking, are more imaginative and more curious (Costa & McCrae, 1992; Hammond et al., 2011). These individuals are more likely to welcome new experiences and change which is a vital element to the process of innovation. Conversely, conscientiousness negatively predicts innovative work behaviour (e.g. Feist, 1998; Niu, 2014; Raja & Johns, 2010). This is because conscientious individuals are more orderly in work, plan ahead, schedule and are dependable which is opposite to the personality needed to promote innovate thinking and behaviour (Costa & McCrae, 1992). However, Woods et al (2018, p. 31) note that the effects of personality on innovative work behaviour may not be justified. This is because the scope of personality is wide-ranging and the effects of personality may interact with other personal and contextual variables. As such, there is the need to account for the multiple variables in one larger study.

From the analysis of the literature discussed above, it can be understood that knowledge on the contribution of employees to innovation is very limited (Lundkvist & Gustavasson, 2018, p.49). For example, researchers have explored the contribution of competencies and communication to innovation, but such research has often focused on collective innovation within organisations (e.g. Zulkepli et al., 2015) or employee perceptions of innovation (e.g. Ortega-Egea et al., 2014). This means that the specific contribution of employee skills, abilities and competencies to the development of innovation at the employee level (i.e. innovative work behaviour) is relatively unexplored. Questions therefore remain as to whether employees drive innovation and the specific contribution employees have to the development of innovative work behaviour.

As demonstrated in the literature review above, there are a variety individual skills, abilities and personality characteristics that influence and inhibit the development of innovative work behaviour. These are summarised in Table 7 below.

Table 7: Enhancers and inhibitors of innovative work behaviour from individual skills, abilities and personality characteristics of employees

Skills, abilities and personality of employees	
Skills and abilities of employees	
Enhancers	**Inhibitors**
• Problem solving abilities • Willingness to participate in innovation related activities • Social interaction skills help employees to share knowledge • Communication skills help employees to share ideas	• Lack of social interaction and communication skills
Personality characteristics of employees	
Enhancers	**Inhibitors**
• Openness helps employees to share new ideas	• Conscientiousness employees are more orderly, plan work and are less spontaneous

2.5 Conclusion

As demonstrated in this literature review there is evidence that informational, contextual and personal factors have an impact on the development of innovative work behaviour. These factors are often linked. It has been demonstrated that the information science literature makes explicit the contribution of interaction and knowledge sharing processes on the development of innovation. However, beyond the studies that have focused on the multiple factors that influence the development of innovative work behaviour more generally (see de Jong & Den Hartog, 2007), and the acknowledgement of the interrelationships between factors, little is known as to how specific informational, contextual and personal factors influence the specific processes involved in innovative work behaviour (i.e. the recognition of the need to innovate, the creation of ideas, the championing of ideas and the implementation of ideas).

Indeed, for much of information science work, there has been little focus on the contribution of information literacy and specific information behaviours to the development of innovative work behaviour in one study. At the same time, the contextual factors that have been explored relate specifically to the information behaviours studied (e.g. the provision of a collaborate space to promote knowledge and information sharing) have often been explored separately, and not in one coherent study. Other contextual factors (e.g. the provision of training and infrastructure of the organisation) have not been studied in relation to information science work, and have often taken the viewpoint of organisational or Human Resource Management studies in how these features enhance innovation on the collective level.

Another feature of the literature is the focus of the work in terms of innovation. Much of the research uses innovation as a central focus, but this is not innovation from individual employees: it is collective innovation across the organisation (e.g. organisational innovation, service innovation, process innovation and management innovation) which give the organisations a competitive advantage over others. Although some research has focused on innovative work behaviour (often referred to as employee-led innovation) there is little research which explored the specific processes of innovative work behaviour noted above. Whilst these studies provide context on how innovation (collectively) may develop, the lack of focus on the specific processes of innovative work behaviour is a gap in knowledge that this research serves to address.

Methodologically there are also some issues to note. Some work adopts a quantitative approach (e.g. a survey method design) to focus on specific concepts (i.e. where a scale can be developed). However, such research sheds little light on the influence on innovative work behaviour development as the quantitative statistical analyses used can only determine any causal or predictive relationships in the data. The studies that use qualitative approaches (e.g. qualitative interviews and focus groups) serve better to respond to the need for better understanding of the complex relationship between workplace learning and innovative work behaviour. However, such work is often carried out in one context only (i.e. either one location, one organisation or one employment area). Despite this, there are studies that use a mixed-methods

approach. This approach serves to firstly identify the relationships and secondly to explore viewpoints and reasons for the relationships identified.

It can be argued that there is the need for a model of innovative work behaviour development. This is emphasised through the study of the relationships of workplace learning and innovative work behaviour. The need for this framework is evident within research by Thurlings et al. (2015). These researchers have developed a model of innovative work behaviour in the education setting of teachers. Additionally, literature reviews of the influence of Human Resource Management on innovation (e.g. Seeck & Deihl, 2016) demonstrate the impact of research on innovation development. From this, there is the need for such reviews form the information science perspective.

The literature reviewed also highlights the role of organisational (as opposed to workplace) learning in the development of innovative work behaviour, both at the individual and collective levels. This is demonstrated within: (1) the organisational studies literature through the provision of training, leadership and infrastructure to facilitate learning and; (2) the information science literature with specific focus on organisational learning. This includes the idea that knowledge management (in particular CoPs) facilitate learning by encouraging interactions and knowledge sharing between participants. Although there are clear distinctions between organisational learning and workplace learning (i.e. workplace learning is learning from individual employees whereas organisational learning is the knowledge management processes in the collective organisation), both relate to the research to be completed. This is because the proposed research is concerned with means by which learning on the individual level at work (workplace learning) can be transferred to the collective level in the bid for improving workplace productivity, employment growth and competitive advantage (organisational learning).

The work completed for the literature review has also identified gaps in knowledge. There is literature lacking on:

1. How individuals and collectives develop innovative work behaviour;
2. Specific details of the role information, context and personal skills and characteristics in supporting individual and collective innovative work behaviour;

3. How different types of workplace learning suit different workplace contexts (i.e. the formal and informal types);

4. Specific determinants (i.e. signals or indicators) of successful workplace learning from both information science and organisational studies perspectives in combination.

These gaps have informed the development of the research questions for the proposed doctoral research.

Presented together, the three research questions are:

RQ1: How do contextual factors support innovative work behaviour for application at individual and collective levels in the workplace?

RQ2: How does information literacy (including the associated information behaviours) support successful workplace learning as related to the development of innovative work behaviour?

RQ3: What are the determinants (i.e. signals or indicators) of successful workplace learning for innovative work behaviour?

Answering the research questions above will contribute to the development of new knowledge and theory on four themes within workplace learning and innovation. The contributions of this research are detailed in Table 8 below.

Table 8: Contributions of the study from addressing proposed research questions

Gaps in knowledge	Research Question to address knowledge gap	Contribution of study
How individuals and collectives develop innovative work behaviour	**RQ1:** How do contextual factors support innovative work behaviour for application at individual and collective levels in the workplace? **RQ2:** How does information literacy (including the associated information behaviours) support successful workplace learning as related to the development of innovative work behaviour?	Develop knowledge on specific requirement as to how individuals develop innovative work behaviour
Specific details of the role of information, context and personal characteristics on innovative work behaviour development	**RQ1:** How do contextual factors support innovative work behaviour for application at individual and collective levels in the workplace? **RQ2:** How does information literacy (including the associated information behaviours) support successful workplace learning as related to the development of innovative work behaviour? **RQ3:** What are the determinants of successful workplace learning in relation to learning to innovate?	Develop knowledge on how information, context and personal characteristics specifically contribute to the development of innovative work behaviours
How different types of workplace learning suit different workplace contexts in relation to innovative work behaviour development	**RQ3:** What are the determinants of successful workplace learning in relation to learning to innovate?	Highlight contextual differences of workplace learning and innovation practice across different organisations Develop knowledge on sector differences of workplace learning and innovation practices

Gaps in knowledge	Research Question to address knowledge gap	Contribution of study
Specific determinants of successful innovative work behaviour development from both organisational studies and information science perspectives (in combination)	**RQ3:** What are the determinants of successful workplace learning in relation to learning to innovate?	Development of a framework (or set of recommendations) to explain how workplace leaning can be used to specifically enhance innovative work behaviour Develop knowledge on requirements of successful workplace learning on individual (workplace learning) and collective (organisational learning) levels Incorporate knowledge from multiple literature domains, namely: (1) information science and: (2) organisational studies in developing knowledge. This will develop knowledge on contextual determinants of successful workplace learning of innovative work behaviour

To answer the research questions stated above, a research paradigm and methodological approach must be considered. This ensures that the research questions can be approached and answered adequately using a suitable theoretical framework. The framework chosen to underpin the work is Social Cognitive Theory (Bandura, 1986). This is because it reflects the interactive nature of the multiple (cognitive, environmental and behavioural) factors that influence innovative work behaviour. Additionally, SCT's origins are not in Information Science. However, as demonstrated in the next chapter, the borrowing of the theory from the Psychology domain, and application to information science work on innovative work behaviour is justified.

Chapter 3: The theoretical framework

3.1 Introduction

There is an abundance of literature from various domains relevant to this research as illustrated in Chapter 2. This means that there is a wide choice of potential theoretical frameworks to underpin this work. For example, there are theories in the literature from innovation, learning and, organisational studies which are relevant to this research. However, the domain of this work is in Information Science and considerations should be made as to the suitability of this domain in the application of a theoretical framework to underpin the study.

The process of considering suitable theoretical frameworks covered four main domains: (1) innovation; (2) learning; (3) organisational studies and; (4) Information Science. However, each search uncovered potential problems in the consideration of the suitability of the theories within each domain (see Table 9).

Table 9: Theories considered and rejected in the development of the theoretical framework for this research

Theory considered	Relevance	Reason for rejection
Innovation theories (Johannessen et al., 1999)	Information science related as they focus on knowledge process within organisations.	Theories center on knowledge management process, which relates to organisational innovation, not innovative work behaviour (see Chapter 2, Section 2.3, p. 21-24).
Diffusion of Innovation Theory (Rogers, 1962; 2003)	A suitable explanation of how innovations are communicated and shared within organisations.	Theory ignores idea creation, an important stage of innovative work behaviour. Theory does not account for resources or social support for innovation.
Organisational creativity (Woodman et al., 1993).	Highlights the importance of social processes in idea creation.	Lack of focus on behaviour surrounding the championing and implementation processes of innovation.
Situated Learning Theory (Lave and Wenger, 1991)	Acknowledges the role of individual people, the role of culture and context, and knowledge acquisition in the learning process.	Does not take into account the *specific role* of individual people and how their own behaviours influence development
Experiential Learning Model (Kolb, 1984)	The theory encapsulates the social interaction and contextual factors deemed important for learning and innovation.	The main focus is process of reflection and the contextual factors to learning development. However, these are not the only factors important in innovation (see chapter 2, Section 2.3, p.26).
Goal Setting theories (Odoardi et al., 2010)	The theory highlights the interplay of factors that lead to innovative work behaviour development.	The focus of this theory is on the predictive nature of goal setting and goal-related theories on work performance (as opposed to innovative work behaviour development per se).

None of the theories considered in Table 9 were deemed specific enough to cover all particular elements of this research, although some theories were

specific to the information science elements of this research. For example, The Diffusion of Innovations Theory (Rogers, 1962) emphasises the idea implementation processes which is vital for innovation, and it has been applied to prior information science work on innovation (Rasmussen & Hall, 2016). Even extensively used learning theories could not be applied to the full study as they miss out some factors that influence behaviour development. For example, Situated Learning Theory (Lave & Wenger, 1991) focuses only on knowledge acquisition whereas Theory of Experiential Learning (Kolb, 1984) ignores personality and behaviours of others. The process of the elimination of unsuitable theories led to the consideration of the need to borrow a theory from another discipline. Given that this kind of borrowing is common in information science work (Hall, 2003), the borrowing of a theory from another literature domain was deemed suitable for this research.

The borrowing of theories from other domains allows for the analysis, synthesis and harmonisation of links between disciplines into a coordinated and coherent whole. Multidisciplinary approaches that involve researchers from different disciplines working together, each drawing on their own disciplinary knowledge, can also be accommodated in such practice.

This borrowing of theory can be observed in the research literature of a range of disciplines, including Information Systems (Treux et al., 2006), Nursing (Rijsford, 2009) and Organisational Studies (Whetten et al., 2009, p. 538). In the case of Information Science, with its strong interests in behaviours associated with information use, the application of theory that originates from Psychology is not uncommon.

Discussed in this chapter is one such psychological theory: Social Cognitive Theory (SCT). SCT was chosen to address the concerns that arose from the rejection of the theories detailed in Table 9. SCT was chosen for this research because:

1. The focus of the theory is of behaviour development (i.e. learning) which is the main focus of this research;
2. SCT accounts for the various factors that influence behaviour development (e.g. social, cognitive and behavioural influencers of behaviour);

3. SCT takes into account the role of individual people and external factors in behaviour development.

An account of the origin and key concepts of SCT is given, illustrated with examples from the broad range of subject domains to which it contributes. Thereafter a detailed analysis of SCT's contribution to Information Science research is presented.

The practical value of SCT is then considered with reference to this research and the application of the theory to the study of innovative work behaviour through workplace learning development from the information science perspective.

3.1.1 Social Cognitive Theory: origins and key concepts

In broad terms, SCT is a psychologically derived theory that explains how individuals within social systems enact multiple human processes, including the acquisition and adoption of information and knowledge. Its main focus is processes of learning, and the interplay between multiple factors therein. Developed by Bandura from the mid-1970s onwards (Bandura, 1977; 1986; 1988; 1989; 1998; 2000; 2001; 2004; 2009), SCT has been widely deployed in research across a range of disciplines, as will be illustrated below.

SCT's roots can be traced to the 1940s and articulations of Social Learning and Imitation Theory (Pálsdóttir, 2013). The main tenet of Social Learning and Imitation Theory is that individuals are prompted to learn in response to various drivers, cues, responses, and rewards, one of which is social motivation. A more recent, and direct, antecedent of SCT is Social Learning Theory (Bandura, 1997). Social Learning Theory explains that people learn through the social processes of observing, imitating, and modelling the behaviours of others. Bandura (1986) adapted Social Learning Theory as SCT to encompass determinants of learning that are neglected in its predecessor: *cognitive* elements important to the learning process, such as thought (for example, anticipated outcome expectations) and feelings (for example, anxiety), are also considered.

Interactions between social and cognitive factors of learning as determinants of behaviour are thus a distinctive feature of SCT (Pálsdóttir, 2013). This is known as 'reciprocal determinism' (Bandura, 1971). A causal model labelled 'triadic

reciprocal causation' highlights the three sets of factors that interplay, interact, and bear influence. These are (i) cognitive and other personal factors such as values, goals and beliefs; (ii) environmental factors; and (iii) behavioural factors. Personal factors, for example, determine how individuals' model and reinforce actions observed in other others. This in turn, determines the behaviours that individuals exhibit in the situation of learning.

SCT also recognises the value of agency. Here individual human agency is two-fold: individuals are considered dependent agents that are both *products* of the social system in which they live, as well as *determinants* of that system's production. They have individual agency to perform independently in any given environment, as well as collective agency when they rely on others to achieve performance collectively through group efforts (Bandura, 2000). Wider networks within social systems are also important in SCT because they provide pathways for the distribution of behaviours across populations.

Learning is the social process that represents the primary focus of SCT. SCT suggests that such acquisition of knowledge and skills comes through 'enactive mastery experience', i.e. direct experience of skills or tasks, and 'mastery modelling', i.e. observational learning from role models (Gong et al., 2009, p.767). In SCT the mastery of new skills and knowledge are of greater interest than the outcome or objective of the learning process.

Self-efficacy, i.e. the personal belief that a task or goal can be successfully achieved within a particular setting, is a concept in SCT that merits particular attention, especially with reference to learning and skills development. Bandura introduced this concept to (the then developing) SCT in 1977 to acknowledge cognitive mediation of action that motivates and enables the processing of stimuli for the alteration of behaviours and actions (Pálsdóttir, 2013). As well as contributing to the effectiveness with which a behaviour can be mastered, self-efficacy also influences the application of skills, and whether or not these are put to good use (Bandura, 1998). The four main sources of self-efficacy are summarised in Table 10.

Table 10: Sources of self-efficacy (Bandura, 1998)

Source	Description
Mastery of experience	The successful completion of prior tasks builds confidence to face future problems and overcome them
Vicarious experience	Observations of peer success encourages positive judgements of individual performance in similar situations
Social persuasion	Encouragement from other to perform successfully
Somatic and emotional states	Positive attitude/mood motivates successful performance

Bandura notes that self-efficacy is domain specific and can differ according to situation (1997, p.42): in some circumstances people may feel more confident about their own behaviours and ability to successfully perform a task, and in others they may not. This is especially important in learning environments where access to resources varies, such as the workplace.

A further concept of relevance here - and one of the three most important to SCT alongside triadic reciprocal causation and self-efficacy - is learning orientation. Learning orientation may be understood as the mind-set that motivates the development of confidence (rather than confidence as an outcome) on the basis of existing skills, knowledge and ability. Those who exhibit learning orientation actively seek challenges and learning opportunities for the acquisition of new skills and knowledge (Bandura, 1977). Traditionally, learning orientation has been conceived as a facet of the individual (Dweck & Leggett, 1988). However more recent research has suggested that learning orientation may also be collective (Gong et al., 2009) when exhibited in organisations with a commitment to learning, open-mindedness and knowledge sharing (Feng et al., 2013, p.2902). This reflects the nature of the two types of agency understood in SCT, as discussed above.

3.1.2 Social Cognitive Theory: applications in prior research

As noted above, researchers working in different subject areas have used SCT. Table 11 shows examples of its application across domains other than Information Science.

Table 11: Examples of the applications of Social Cognitive Theory in academic research

Discipline	Theme	Example
Careers	Formation of career-related interests and pursuit of educational and occupational choices	Lent et al. (1994)
	Career decision-making	Blanco (2011)
	Job seeking	Zikic and Saks (2009)
Education	E-learning	Zhang et al. (2012)
	Self-efficacy in prisons	Allred et al. (2013)
	Gifted education	Burney (2008)
	Self-efficacy and student engagement	Schunk and Mullen (2008)
	Self-efficacy, health promotion, and regulation of human behaviours	Bandura (1998); Bandura (2004); Chapman-Novakofski and Karduck (2005); Cook et al. (2015); Gordon et al. (2015); Knowlden and Sharma (2012); Krebs et al. (2017); Lyons et al. (2014); Rosal et al. (2014); Zhang et al. (2013)
Information Systems	Adoption of public sector electronic services	Agarwal et al. (2013); Liang and Lu (2013); Rana and Dwivedi (2015)
	Computer training, and systems use	Agarwal et al. (2000); Baker et al. (2014); Bolt et al. (2001); Chiang and Hsiao (2015); Compeau and Higgins (1995); Hasan and Ali (2006); Hooper (2012); Sherif et al. (2009);

Discipline	Theme	Example
		Waldman (2003); Wang et al. (2015); Yap and Gaur (2016); Yi and Davis (2003)
	Use of the Internet and Web	Collins et al. (2012); Hoffman et al. (2015); Pearson and Pearson (2008)
	Information security	Gulenko (2014)
Organisational Studies	Improvement of levels of organisational performance	Bandura (1988)
	Collective organisational management	Wood and Bandura (1989)
	Job satisfaction	Hwang et al. (2016)
	Self-efficacy, leadership, learning orientation, and creativity	Gong et al. (2009)
Media and Communication Studies	Internet use and gratification	LaRose and Eastin (2004)
	Social networks, media and mass communication	Bandura (2009)

SCT has been used extensively in Applied Psychology, particularly in respect of learning in different contexts (Ellis-Ormrod, 2004). Formal education settings have been most frequently explored, with an early focus on learning and the alignment of SCT with other educational models (e.g. Burney, 2008). More recently, educational researchers have turned their attention to self-efficacy as a key concept of SCT (for example, Schunk & Mullen, 2012). This is evident in a large number of studies that are concerned with health education: the promotion and encouragement of healthy lifestyles in general (e.g. Lyons et al., 2014), and in respect of certain medical conditions such as cancer (Krebs et al., 2017), diabetes (Rosal et al., 2014), heart disease (Cook et al., 2015), kidney disease (Gordon et al., 2015), and obesity (Knowlden et al., 2012).

Interest in individuals in workplace environments in the Organisational Studies literature is also relatively recent. For example, in 1989 Wood and Bandura were more concerned with collective organisational management than with individuals, and it was another twenty years before the notion of self-efficacy as a mediator in the relationships between leadership, learning orientation and creativity among employees was proposed, and thus placed individuals as a central focal point of research in the workplace (Gong et al., 2009).

As well as individual studies, a number of reviews of the extant literature where SCT has been applied are available. For example, in 2008 Godin et al. published a literature review on the use of SCT in studies of the behaviour of healthcare professionals. Perhaps of greater interest to Information Science researchers, however, is a literature review authored by Carillo (2010) on the deployment of SCT in the related field of Information Systems. This aligns SCT with other theoretical perspectives in the domain. The review identifies that in the 1990s SCT initially attracted the attention of Information Systems researchers interested in the concept of self-efficacy, and keen to understand behaviours around technology adoption and use (p. 21). A key consideration identified in Carillo's work is that few studies reviewed consider the emotional element emphasised by SCT (p. 27). Carillo (2010) makes explicit that the value of using SCT, however, does not lie in considering self-efficacy on its own. Rather its power is found in highlighting the complex nature of the learning processes in which self-efficacy is intertwined (p. 26), the inter-relationships of self-efficacy with cognitive, emotional, and environmental factors, and their continuous influence on one another (p. 28).

Also of interest in studies in the wider literature is the influence of SCT and its components on theory development in fields other than Psychology. For example, the concept of reciprocal determinism (i.e. interactions between social and cognitive factors of learning as determinants of behaviour) prompted Compeau and Higgins (1991) to develop a theory that takes into account individual reactions to computer technology within the environment in which learners are based, and relates these to competence development (1991, p.187). This concept of reciprocal determinism is particularly relevant this work in the study of factors that influence innovative work behaviour development through workplace learning.

3.1.3 Social Cognitive Theory and Information Science research

The relevance of SCT to the domain of Information Science has been acknowledged, particularly in respect of research into information seeking behaviour and use (Case & Given, 2016: 2010; Savolinen, 2012; Wilson & Walsh, 1996). Pálsdóttir (2013), for example, argues that this theory has been valuable in investigations into motivations to seek information, to share knowledge, and to learn. The treatment of SCT in the Information Science literature as pertinent to two themes is thus elaborated below: (i) information seeking behaviour and use (including information literacy) and (ii) knowledge sharing. Examples of relevant studies are summarised in Table 12.

Table 12: Examples of the applications of Social Cognitive Theory in Information Science research

Information Science theme	Focus	Example
Information seeking behaviour and use	Consumption of social media content	Li and Lin (2016); Lu and Lee (2010)
	Information retrieval skills in academia	Beile and Boote, (2004); Ford et al. (2001); Nahl (1993); Ren (2000)
	Information retrieval skills in the workplace	Ren (1999)
	Information literacy in academia	Kim (2010); Kurbangolu, (2003); Lim and Kwon (2010); Pinto (2010); Pinto (2011); Ross et al. (2016); Stokes and Urquhart (2010); Usluel (2007)
	Everyday life information seeking	Pálsdóttir (2008)
Knowledge sharing	Blogging	Zakaria et al. (2013)
	Knowledge management systems	Dong et al. (2016); Lin and Huang (2008); Lin and Huang (2009)
	Public sector employees	Bock and Kim (2002); Olatokun and Nwafor (2012)

Information Science theme	Focus	Example
	Wikipedians	Cho et al. (2010)
	Online communities	Chui et al. (2006); Cheung et al. (2013); Kuo and Young (2008); Liou et al. (2016); Olapiriyakul and Kangsirikul (2012); Zhou (2014)

Typically studies of information seeking behaviour and use that deploy SCT have been conducted in educational settings with students as their data subjects, as is the case with much information seeking behaviour research (O'Brien et al., 2017, p. 248). In the earlier published work researchers wished to explain differing levels of skill in information retrieval tasks. For example, Ren (2000) found that students who had undertaken training in digital information seeking skills had higher beliefs of self-efficacy, and this contributed to an increase in search performance when they needed to search for information online. Similarly, Ford et al. (2001) found a link between low belief in self-efficacy and poor attainment amongst students presented with a task that required them to use the Internet as a source of legal information. Meanwhile Kim (2010) challenged expectations based on SCT in a student of gender differences in the use of university library website resources. Such work has often been designed with a view to determine practical interventions to raise performance, for example through training that enhances beliefs of self-efficacy (e.g. Beile & Boote, 2004; Nahl, 1993).

Studies of a similar nature conducted in workplace settings are less readily identified. However, they tend to have reported findings that are comparable to those from academia. For example, Ren (1999) explored information source use of business executives and demonstrated that managers preferred to access sources, which - according to their own personal assessment - they had greatest competency in using.

Other (often more recent) work that deploys SCT in respect of research into information seeking behaviour and use is framed as information literacy research. Here, again, the theme of self-efficacy dominates the discourse. For

example, Lim and Kwon (2010) uncover links between self-efficacy and information resource use with reference to gender differences; Ross et al. (2016) explore relationships between self-efficacy and information literacy in lifelong learning in a population of university students (likewise Kurbangolu (2003) in earlier work)); Stokes and Urquhart (2010) profile the information literacy of nursing students according to learning style, personality and self-efficacy; and in a study of student teachers Usluel (2007) proposes that information literacy skills may develop with experience over time as belief in self-efficacy grows (p. 100). Self-efficacy has also featured as a key theme of research that has considered the consumption of health information from an everyday life information seeking perspective (Pálsdóttir, 2008).

Scales of measurement have emerged from some of these information literacy studies that draw on SCT. For example, Kurbanoglu (2003), Kurbanoglu et al. (2006) and Pinto (2010; 2011) have created scales for the assessment of levels of self-efficacy to help practitioners in the delivery of information literacy programmes. A further early methodological contribution is the development of a discourse analysis technique for speech and text analysis of discussions of information practices that integrates concepts of SCT (Nahl, 2007).

Some output from a number of studies of information behaviour and use deploy the vocabulary of SCT, yet without explicit reference to it. For example, Tuominen et al. (2005) argue that information literacy may be regarded as a social practice that is influenced by the environment (particularly the information environment), and emphasise the interplay between information technologies, workplace learning and knowledge formation processes as important to its development. Similarly, Zhang et al. (2010) refine a model that accounts for the influence of information literacy skills on environmental scanning activities in the workplace. This work references to self-efficacy (p.729), but not to SCT per se. More recently Hassell and Sukalich (2016) have cited the work of Bandura and commented on self-efficacy in social media use without mentioning SCT.

In respect of studies of knowledge sharing, with some exceptions (e.g. Bock & Kim, 2002; Olatokun & Nwafor, 2012), most of the research on this theme that incorporates SCT tends to focus on practice in online environments (e.g. Cheung et al., 2013; Chiu et al., 2006; Cho et al., 2010; Kuo & Young, 2008; Liou et al., 2016; Zakaria et al., 2013; Zhou, 2014), often with the purpose of

identifying motivational factors (as noted by Oh & Syn, 2015). In common with the published work on information seeking behaviour and use, it is the concept of self-efficacy that merits most discussion in such studies. For example, Bock and Kim (2002) argue that public sector managers' self-efficacy motivates knowledge sharing, and this also contributes to organisational performance; Cho et al. (2010) identified that those with higher knowledge self-efficacy are more likely to share knowledge within an online community; Chiu et al. (2006) found that outcome expectations, i.e. the belief that certain tasks will be accomplished with a certain outcome, influence both the quality and quantity of knowledge shared; Kuo and Young (2008) observed a link between self-efficacy and knowledge sharing amongst teachers who participate in virtual online communities; and Olatokun and Nwafor (2012) found that knowledge self-efficacy was a strong determinant of knowledge sharing practice (alongside enjoyment in helping others).

As well as providing an underpinning theoretical framework for studies in Information Science such as the examples cited above, SCT has contributed to theory development within the field. Savolainen (2012, p.507-508), for example, emphasises the role of self-efficacy in studies of information seeking behaviour and use, and highlights that SCT is valuable in the renewal of theory on information behaviour because it can help bridge the gap between psychological and Information Science perspectives on the same phenomena. As illustration, he drew upon the concept of self-efficacy in his model of network competence (Savolainen, 2002). Similarly, Wilson and Walsh cited Bandura (1977; 1986) using the concept of self-efficacy in the presentation of their revised general model of information behaviour of 1986, and Ford (2004) refers to the influence of mental states on information seeking and makes direct reference to self-efficacy in his proposal for a model of learning-related information behaviour. That SCT can be deployed to catalyse theory development in another domain in such ways strengthens the case for its deployment in further studies, such as that outlined below.

3.1.4 Social Cognitive Theory and Information Science research on workplace learning and innovative work behaviour

It has been established through the review of the literature presented above that SCT has proved a valuable tool in studies that focus on learning, and this

includes prior work that has been conducted in the domain of Information Science. Particular reference is also made by Odoardi et al. (2010) who emphasise the importance of SCT in behaviour change and work performance as related to innovative work behaviour development (2010, p.4).

There are also precedents for adopting such a theory in a study of workplace learning and innovative work behaviour from an Information Science perspective. This evidence pointed to the value of adopting SCT in the current research. In addition, that SCT has previously proved successful in prompting theory development in Information Science, strengthens the case for its adoption, not least because an outcome of the study is the development of a framework that explains how workplace learning can support innovative work behaviour development within organisations. The full contributions of the work are discussed in Chapter 8 and summarised on page 245.

The use of SCT in this research has benefits in terms of (i) integrating knowledge and methods from different disciplines and (ii) using a real synthesis of approaches in the research. One of these benefits, for example, is that SCT allows the research to address the complexities associated with producing theoretical perspectives that have wide external application and impact. (Other benefits, which are also be prompted in this research, include the debate of existing disciplinary boundaries (Zahra & Newey, 2009)). More specifically, the adoption of SCT in this research helps by filling gaps in knowledge related to (i) the means by which individuals and collectives develop innovative work behaviour; (ii) the environmental (contextual), individual and behavioural factors that support or hinder the development of innovative work behaviour; and (iii) how relationships between workplace learning and innovation differ according to organisational context. This contributes to the development of a framework for the enhancement of innovative work behaviour within the workplace, which will be presented in chapter 8.

This use of SCT also contributes to the body of work on SCT itself through consideration of learning processes in multiple contexts. It addresses the criticisms of prior studies that have tended to take for granted the complexity of learning (such as those identified by Carillo, 2010), with scant reference to triadic reciprocal causation and learning orientation, at the expense of a strong focus on the concept of self-efficacy. For example, by taking advantage of

SCT's treatment of individuals as (i) independent agents and (ii) in collectives, elements of individual learning (workplace learning) and collective learning (organisational learning) become apparent within this single research project. Similarly, the application of the concept of learning orientation draw attention to the factors that influence the processes of learning necessary for the *development* of innovative work behaviour, such as knowledge sharing practice (rather than whether or not any specific learning outcome is achieved). Of further value is that this research focuses on learning in the workplace environment, unlike many previous studies which have been biased towards recruiting students as data subjects. This work responds to a recent call in the Information Science literature that 'More [information behaviour] research should be undertaken with… specialized populations operating in specific contexts, e.g. the workplace' (O'Brien et al., 2017, p. 251) - as opposed to with university students.

3.2 Conclusion

The review of the potential theoretical frameworks in this chapter has led to the conclusion that there is much choice for this research (see Table 9 on page 68). Social Cognitive Theory (Bandura, 186) was considered in depth in relation to the application of the theory to prior work. This work includes some Information Science research (see Table 12 on page 76) and also work in studies related to the main themes in this research (see Table 11 on page 73).

SCT was deemed suitable for application in a study of workplace learning and innovative work behaviour because; (1) prior work provides support as to the application of SCT to information science research; (2) prior work provides evidence as to the application of SCT to organisational studies research with relevance to this research; (3) SCT has been used in research within multiple workplace contexts; (4) concepts within SCT (e.g. reciprocal determinism) are have been used in prior studies to highlight the inter-relationships between multiple factors that play a role in learning and behaviour change (e.g. cognitive, environmental and behavioural). This learning is important for innovative work behaviour development (Høyrup, 2010) and; (5) SCT has not been used in the study of workplace learning and innovative work behaviour from the Information Science perspective, but studies of relevance to this research. The methods used in the study are presented in Chapter 4.

Chapter 4: Methodology

4.1 Introduction

The purpose of this chapter is to explain the methodology used to conduct the research undertaken as part of this thesis. The chapter contains a synopsis of the philosophy which underpins the study, and justification of the use of the case study approach used to investigate the research questions. The research questions are as follows:

RQ1: How does information literacy (including the associated information behaviours) support successful workplace learning as related to the development of innovative work behaviour?

RQ2: How do contextual factors support innovative work behaviour for application at individual and collective levels in the workplace?

RQ3: What are the determinants (i.e. signals or indicators) of successful workplace learning for innovative work behaviour?

The justification of the study approach is followed by an explanation of the research implementation where differences in implementation for each case study are highlighted. This includes the process of data gathering. In addition, the sampling used for each case study and characteristics of each case study sample chosen are given. Finally, an explanation of the ethical considerations and methodical limitations are discussed.

4.2 Research philosophy and approaches considered for this research

Developing a philosophical perspective (or approach) to research is key to understanding the most appropriate tools to use and the right methodological approach to answer research questions (Pickard, 2013, p. XVii). Paradigms provide a means of exemplifying and explaining research and how to solve a given scientific problem, including the methodological approach used (Seale, 1998, p.12). There were three main research paradigms considered when developing the approach to this research: (1) the positivist approach; (2) the postpositivst approach and; (3) the constructivist (interpretivist) approach.

Positivism roots its ontology in the belief in the existence of one objective independent and stable reality from the realist view (Pickard, 2013, p.8). Such a reality is only applicable through discovery and analysis where phenomena is determined real only if it can be observed. From an epistemological stance, knowledge is objective, and the researcher acts as a separate agent from knowledge to avoid subjectivity of knowledge (Hislop, 2013, p.18). Therefore, knowledge can be quantified, measured and general laws can be established where objective knowledge is produced as a result of the general law development (Hislop, 2013, p.18). Research underpinned by the positive approach uses models, experiments and manipulation to test hypothesis and deduce laws form quantifiable results (Pickard, 2013, p.9).

This positivist approach is criticised by post-positivists due to the nature of uncertainty and relativity within science. They believe that for ontologically social factors exist independently of human beings (Pickard, 2013, p.10). It is often not possible to fully 'know' these relationships due to uncertainty and imperfections in knowledge caused by human fallibility (Ryan, 2006, p.9). The Postpositivsts' epistemological stance is that the knower and the known are not completely separate. The subjectivity of knowledge means the researcher must attempt to be objective through methods of experimentation and hypothesis testing, coupled together with qualitative methods to explore interpretations of phenomena (Pickard, 2013, p.11).

The constructivist (interpretivist) approach posits that reality is the product of human experiences and can be constructed within the human mind where multiple realities exist (Pickard, 2013, p.11). Such realities are created through perceptions and actions of social actors themselves, embedded into context separate from the human being (Flick, 2009, p.66-67). Consequently, epistemologically the knower and the known influence and interact with each other and research is often changed by experiences (Pickard, 2013, p.12). Knowledge is thus constructed by selection and structuring, and experiences are constructed or understood through contexts and concepts situated within processes of social exchange and interactions (Flick, 2014, p.77). This perspective is also known as the practice-based perspective where knowledge is embedded in practice, and knowledge is viewed as either explicit or tacit, individual or collective. Knowledge is therefore open to dispute (Yanow, 2004)

and can be challenged, contested and legitimately questioned based on perceptual differenced of people (Hislop, 2013, p.39). Challenging can occur through qualitative methods of dialectical interchange with participants to understand meaning behind actions and express views (Pickard, 2013, p.13). Methods are subject to interpretations from the researcher and can make inferences based on their own interactions with the results (Pickard, 2013).

The approaches discussed in this section have all been used in information science research (see Kankam, 2019 for a review of the paradigms in information science research). There is emphasis on choosing the right paradigm for the concepts being studied (Kankam, 2019, p.91).

4.2.1 The philosophical approach used in this research

The research design of the research reported in this thesis was information by the post-positivist approach. This is because the ontological and epistemological stances of this approach were deemed suitable for the exploration of the innovative work behaviour, which was the main aim of this research.

The nature of reality form the post-positivist perspective is viewed as critical realism (Pickard, 2013, p.7). This is because post-positivism distinguishes between the 'real world' and observed world as part of a social reality. Post-positivism suggests that the 'real world' cannot be observed directly and is independent of human actions. Instead, humans experience the 'observed world' constructed through their own experiences and perspectives. It is suggested that the unobserved structures in the 'real world' influence the observable events that humans experience. Therefore, the aim of research which is influence by the post-positivist approach is to understand the structures that comprise the social world, including the unobserved structures and events that influence the observable world that humans experience (Pickard, 2013, p. 10-11).

Epistemologically, the difference between the 'real world' and 'observed world' can cause doubt in knowledge. The difference between the observed and unobserved elements of reality mean that knowledge can be questioned and doubted. The knower and the known are therefore completely separate. Therefore, human fallibility creates imperfections as it is not possible to fully

know and understand the cause and effect relationships assumed in the 'observed world' if these are impacted by the unobserved structures in the 'real world' (Pickard, 2013, p.10-11).

Taking the ontological and epistemological viewpoints of the post-positivist approach into consideration, a mixture of methods were used in this research. Although the approach taken by post-positivists serves to experiment and hypothesis test, one difference between the post-positivist approach to the others discussed above in section 4.2 is the additional use of qualitative methods to allow for the interpretation of findings in research (Pickard, 2013, p.11). This means that the identification of potential cause and effect relations can be carried out (i.e. through the identification manipulation of variables in qualitative work) along with methods that serve to enhance the understanding of nature and reasons for the patterns, including the unobserved factors that may influence the relationships. Thee research reported in this thesis therefore adopts a multimethod approach and combines the use of both quantitative and qualitative methods to collect and analyse data. The multimethod approach

4.2.2 The multi-method approach

The multimethod approach used in this research was influenced by the post-positivist approach (see section 4.2.1 above). This is because the multimethod approach allowed for the examination and identification of the multiple factors that influence, interplay and interact to enhance and inhibit innovative with innovative work behaviour development through quantitative and qualitative methods. In addition, this research served to explore why these relationships occurred through qualitative methods. The application of this research approach was used in a deductive way to draw conclusions from the data which emerged from the study participants rather than just to test a specific hypothesis (see Morse, 1991; 2003).

In addition, using more than one data collection method in a study develops the understanding of a human behaviour and experience as a full picture rather from individual viewpoints (Morse, 2003, p.189). To this end, the use of multiple methodologies across multiple case study settings enables enhanced pictures to be created. In this research, the post-positivist driven multi-method approach

allowed the description and explanation of the main concepts from various perspectives of employees (Morse, 2003, p.198)

Some of the prior studies reported in Chapter 2 have also adopted a multi method approach (e.g. Auernhammer & Hall, 2014; De Vos et al., 2015, Giannopoulou, et al., 2014, Pattinson & Preece, 2014). Such studies used both qualitative and quantitative methods to gather data, including interviews, focus groups and questionnaires as in this research. The conduction of two or more research methods, each carried out rigorously and complete in itself in one project allows for comprehensive data to be gathered on the main concepts (Morse, 2003, p.190). The findings are then triangulated to form a whole research project. The triangulation of findings in this research allowed for the validation of findings in respect of increased credibility (Pickard, 2013, p.21). As with prior studies (e.g. Ayob et al., 2011, p.249; McNamara et al. 2014), the findings of this research were compared across methods to determine whether findings were similar in each, and they were also compared across settings to highlight any similarities or differences in the themes that emerged. The triangulation increased the validity of findings across multiple workplace contexts. It enriched data quality in this research and provided data validation to address limitations of each given data collection method (Flick, 2014, p.194-187; Miles & Huberman cited in Pickard, 2013, p.102).

The mixing of different research methods as done in this research required an epistemological framework to explain 'reality' uncovered by the different research methods. This approach has been useful within the information sciences domain (Ma, 2012, p.859) and is evidenced in the use of the three methods reported in this chapter in the exploration of innovation from the employee-led perspective. Further details of the research design are given in the sections below.

4.3 Research design

4.3.1 Choice of case study methodology

The research design was based on the philosophical approach adopted by this work: a pragmatic approach that incorporated elements of the post-positivist perspective. A case study research design was chosen with data collection

through means of qualitative and quantitative methods to collectively answer the research questions.

The case study design adopts elements of the post-positivist approach, taking perceptions and experiences of reality into consideration (Pickard, 2013, p.11). These realities are created through perceptions and actions of social factors and the interpretations of the humans in reality (Flick, 2009, p.66-67). Yin (2008, p.23) describes case study methodology as 'an empirical inquiry that investigates a contemporary phenomenon within its real-life context: when boundaries between context and phenomenon are not clearly evident; and in which multiple sources of evidence are used'. The case study approach used for data collection in this research was applied to encompass the contextual factors of learning and innovation whereby context and employee behaviour often overlap. The phenomenon of innovative work behaviour investigated in this work was investigated through the collection of data from employees of multiple organisations through means of interviews, focus groups and questionnaires.

The aim of the case studies reported in this thesis was to provide a holistic account of how innovative work behaviour develops and the factors that influence employee behaviour when innovating. The exploration of enhancers an inhibitors of innovative work behaviour was impossible without the study of multiple contexts to highlight similarities and differences in behaviours of employees and whether these behaviours are '*representative or typical case'* (Bryman, 2016, p.62). In this respect, the case study approach has been used in this research to explore the different contents in which innovative work behaviour develops.

The use of a single case study would not enable generalisability of findings or highlight contextual differences (Beauseat et al., 2013; Hasu et al, 2013; Palo & Padhi, 2003). Three organisations in three different geographical locations were chosen as part of this research: data, in the form of interviews, focus groups and questionnaires, were collected.

4.3.2 The data collection methods chosen for this research

In this research, data were collected through interviews, focus groups and, quantitative questionnaires. The choice of the methods used are discussed in this section.

4.3.2.1 The collection of data through interviews and focus groups

Interviews and focus groups are research methods within the postpositive approach as they allow for the interpretation of findings (Pickard, 2013, p.107). In this research, data were collected from participants through semi-structured interviews and focus group discussions to explore the views, perceptions and experiences of the participants as suggested by the approach (Pickard, 2013, p.7). Focus groups were chosen to enrich the data collection in each case study as the focus group setting facilitates more discussion from participants as opposed to the individual interview discussion in an interview setting.

The collection of data through focus group discussions made the topic of conversation the subject of the research. A focus group is essentially a group interview which involves more than one person (Bryman, 2016, p.500) as in this research. Focus groups were chosen as part of the data collection for this research as they allowed for the facilitation and guidance of conversations from the participants. In addition, the facilitation of conversations enables the mediation of conversations to highlight different viewpoints that emerged from discussions with participants (Pickard, 2013, p.243).

The application of interviews and focus groups as a method of data collection is evidenced within the literature discussed in Chapter 2 of the thesis. Such an approach has been used by previous research in the use of case studies including in-depth interviews (e.g. Harbi et al., 2014; King, 2008; Mavin & Roth, 2015; Sykes & Dean, 2013). This approach was used to gain further insight into contextual characteristics including areas of workplace development (Ellinger & Cseh, 2007), and was used in a similar way in this research.

4.3.2.2 The collection of data through quantitative questionnaire

Quantitative research can be used in multimethod research to clarify distinct elements of research or validate findings from qualitative elements (Gorman & Clayton, 2005, p.8). The use of a questionnaire method to collect data in this

research was chosen to triangulate findings from the analysis of qualitative data.

The use of the quantitative questionnaire enables the testing of relationships within the data collected (Pickard, 2013, p.113). In this research, the quantitative questionnaire was chosen to explore specific factors that influence innovative work behaviour and to statistically test these.

Some of the prior studies reported in Chapter 2 use quantitative questionnaires as the data collection methods (e.g. Chen & Huhang, 2009; Martins & Martins, 2002; Ortega-Egea, et al., 2014). The studies noted provide evidence as to the prior use of questionnaires in the study of innovation and help to justify the use of questionnaires as a data collection method in this research.

4.3.3 Data analysis of interviews, focus groups and the questionnaire

In this research, data analysis took place in three main stages. The initial stages analysed the qualitative data from interview and focus groups using a thematic analysis (see section 4.3.3.1 on page 89). The second stage analysed the quantitative survey data using a series of statistical analyses (see section 4.3.3.2 on page 98). The final part of the analysis brought together the analysis of the qualitative and quantitative findings to add meaning to the findings overall.

4.3.3.1 Data analysis of the interviews and focus groups

The data collected from interview and focus group discussions were subject to a thematic analysis (Guest et al., 2012). The choice of analysis was directed by the abundance of literature to explain the factors that underpin innovative work behaviour development (see Chapter 2) as well as the variety of methods used. Therefore, a thematic analysis was chosen to allow for themes to emerge from the discussion with the participants. The purpose of the analysis was to allow the participants to be at the forefront of the findings that emerged form data and to highlight the themes that merged from discussions with participants. The stages of the thematic analysis are given in Figure 2 below, and explained in further detail following Figure 2.

Stage 1: Data familiarisation (i.e. scope transcriptions)

↓

Stage 2: Generation of codes and potential themes

↓

Stage 3: Coding of data

↓

Stage 4: Consideration of code meaning to themes

↓

Stage 5: Review of themes to theory and research questions

↓

Stage 6: Give name and meaning to themes
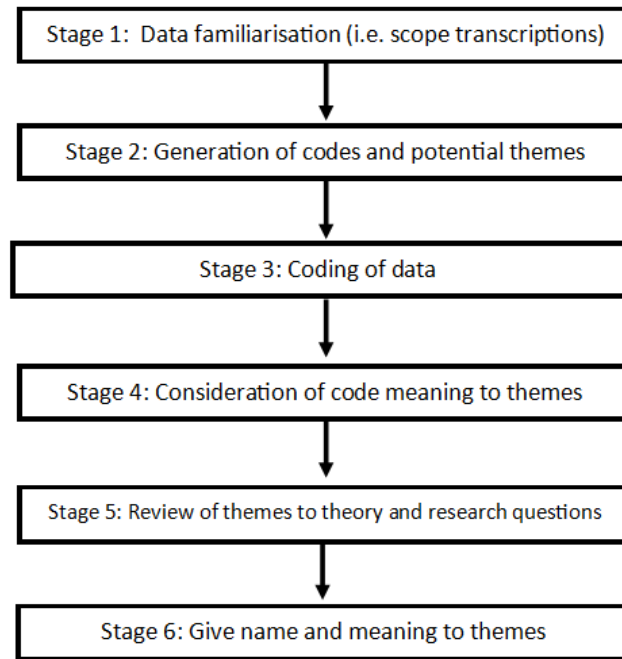
Figure 2: Stages of Thematic Analysis conducted in this research

The interview and focus group data were transcribed (see Appendix G on page 330 for an example of transcription) so that they could be imported into NVivo for the analysis. The transcription of the interview and focus group data was carried out by an external transcriber, approved by Edinburg Napier University. The initial recordings sent to the external transcriber contained no personal details as these were removed prior to sending. Initially the external transcriber returned three transcripts. These were compared with transcripts made by the researcher on the same data to verify that the detail of the content was the same in each. This helped to verify that the transcriptions from the external transcriber were of a high standard and that they were transcribed verbatim. All transcriptions were then imported into NVivo to allow for a coding process to begin.

In this research, the data from each case study were analysed separately to allow for comparison of findings after the analysis took place (see Chapter 8). The purpose of doing so was to explore the themes that emerged from each case study individually to allow for contextual factors in study findings to be highlighted.

Once imported into NVivo, the transcripts were coded. The purpose of coding the data was to categorise phrases and sentences from the transcriptions of the

interview and focus group discussions in order to provide evidence of the themes that emerged.

The coding and analysis for each set of qualitative data followed a stage process. Initially, a process of data familiarisation took place. This involved the reading of the transcripts to make general notes as to meaning of quotations (see Appendix G on page 330 for an example of a transcripts in this research). However, no further meaning was added in this stage in respect of other quotations. The familiarisation stage was solely to understand the content of the transcriptions.

Next, category identification took place. This involved the identification of potential categories to which the quotations could be situated in. The purpose of this stage was to aid the development of the conceptual framework (see Chapter 9, section 9.3 on page 258). As part of the coding process, an initial coding tree was developed (See figure 2 below). The purpose of the coding tree was to provide a series of categories where participants' responses could be placed in during the next stage of the analysis.

In the coding tree creation, Social Cognitive Theory (Bandura, 1986) was used to create initial categories (see point (a) of Figure 2 below). These categories were: (1) cognitive factors; (2) environmental factors; (3) behavioural factors as a replication of the categories identified in the concept of 'Triadic Reciprocal Causation' (see Chapter 3, section 3.1.1 on page 71). The creation of these initial categories using SCT ensured that the coding tree included factors that were classified as one of the three SCT factor types notes above For example, in the 'cognitive' category, factors that include how people think, feel and process thoughts and information were include (e.g. information literacy, personality and attitude of employees). The focus of this category is the characteristics of individual employees. In the 'environmental' category, factors that are present in the workplace environment were given in the coding tree. For example, the culture of the organisation influences innovation and the leaders within the environment help to promote the culture and provide additional resources to employees (e.g. training). Finally, in the 'behavioural' category, factors in the coding tree included the specific behaviours of employees, both the employees who are innovating and employees who influence other employees. This included behaviours with information (e.g. information seeking

91

and information knowledge sharing) and support provided from leaders (e.g. emotional and practical support for innovative work behaviour development).

These initial categories were then sub-categorised to allow for the specific details of the factors to emerge (e.g. sub-categories of environmental factors included organisational culture, leadership and, strategy, see point (b) of the figure below). It was at this point that the literature (See Chapter 2, section 2.4 starting on page 26) was reviewed to ensure that the sub-categories covered all elements of innovative work behaviour enhancement as detailed in the literature review.

Next, the participant responses were grouped together (coded) in the categories identified within the coding tree, if they were on a similar topic. At this stage, the coded data was reviewed to ensure that each quotation was appropriately placed in a suitable code category. Further sub-categories were added if the participant responses did not fit suitably within a category already created. In addition, if there were little or no quotations in the code categories, consideration was given to combine or remove categories. This led to the creation of the final coding framework (see Figure 4 below).

The coding of the participant responses then helped to create a list of potential themes. The themes served to explain the quotations which had been grouped together and provide an understanding of the meaning of the coded quotations. The purpose of doing so was to see where the coded data would fit together, and explain any relationships between the themes. At this point, the coding process (as identified above) was repeated until saturation was reached and no new sub-categories emerged from the data. This ensured that all coded data was suitable categorised and helped to review the quotations in each theme before the naming process could begin.

In the final stages of the thematic analysis, consideration of the name and meaning of the themes identified in the stages above was given. To do this, the quotations in each theme were explored to identify why these were similar or different to each other. The identification of similarities and differences helped to provide an explanation of the meaning of each theme in relation to the quotations within the theme. The quotations from the participants were then used to provide evidence to explain each theme in detail as reported in the

findings chapters in this thesis (see Chapters 5, 6 and 7). As part of this process, the literature was re-reviewed in order to explore any similarities and differences. This part of the process was used in the final part of the analysis of the data collected in this research (see section 4.3.3.2 below).

Figure 3: Coding tree used in the initial thematic analysis of qualitative data collected in this research
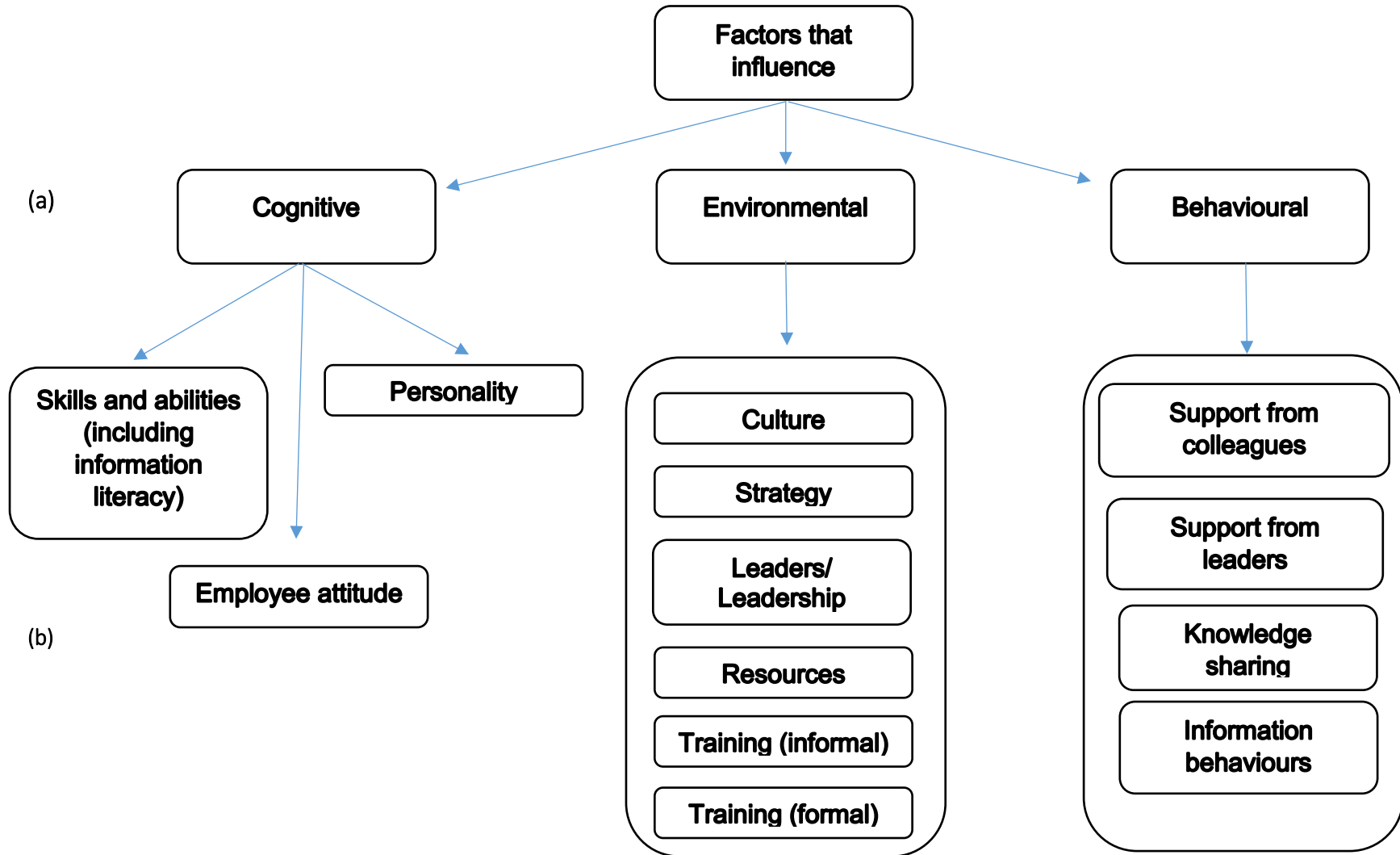
Figure 4: Final coding tree used in the thematic analysis of qualitative data collected in this research

Factors that influence

Cognitive

Environmental

Behavioural

Skills and abilities (including information literacy)

Personality

Employee attitude

Information needs recognition

Information seeking

Information analysis / interpretation

Information and knowledge sharing

Culture

Strategy

Leaders/ Leadership

Resources

Training

Support from colleagues

Support from leaders

Information behaviours

Information behaviours were further categorised to type of behaviour

4.3.3.2 Data analysis of the quantitative questionnaire

The data gathered in the questionnaire were analysed using the SPSS v23 software package (see Appendix H for an example of the SPSS output). As with the qualitative analysis, the questionnaire data from each case study were analysed separately and then compared (see Chapter 8). The first stage of the analysis involved a data cleansing process to remove any errors from data. At this stage, the data were also screened for missing values. There was a high dropout rate for the questionnaire completion (see Table 37 on page 269), a known problem in quantitative work (Roth, 1994). It is known that missing data causes a loss in statistical power of analyses (Roth, 1994, p.538). However, the decision was taken not to replace missing values with averages (e.g. the mean value of that variable) or delete participants with incomplete data. This is because the large amount of missing data would mean that replacing the missing values with other values would make the validity of the findings questionable.

Next, the data were analysed using descriptive statistics. Frequencies were generated to gain insight into the demographics of the sample. As many of the variables were correlated factor analysis was used to reduce the dimensionality of the data

Inferential statistics were used to gain in-depth knowledge as to the factors that influence innovative work behaviour development (e.g. employee participation in activities related to learning and innovation), and whether these relationships were of statistical significance. The analysis comprised three stages:

1. **Reduction of the independent variables into fewer, more manageable variables.** This stage involved taking all 28 factors that influence innovative work behaviour (from questions 3 and 4 in the questionnaire, see Appendix B on page 318) and grouping these together to form fewer groups of variables. The aim was that the groups included variables (the questionnaire questions) that were similar in meaning (e.g. all variables in the 'knowledge sharing' group were broadly related to knowledge sharing).

2. **An exploration as to the reliability of the variables which created each factor.** This stage involved testing whether the variables in the groups noted in stage 1 were related and whether they fitted well together as a group of variables. The purpose of doing so was to see whether there were any variables (from the survey question responses) did not fit well in the groups.

3. **An exploration of the factors that predict participation in learning and innovation activities.** In this stage, the factors that are seen to enhance innovative work behaviour development (question responses from question 3 and 4 in the questionnaire, see Appendix B on page 317) were tested to see if they would predict whether the respondents participated in the series of learning and innovation activities (from question 5 in the questionnaire.

In stage 1, a Factor Analysis was carried out in order to reduce the 28 variables (factors important for innovative work behaviour development) to a manageable number of factors (Field, 2009). For each case study, this produced five or six factors. Each factor was explained by a combination of the variables entered into the analysis.

In stage 2, the Cronbach's Alpha test of reliability and consistency was applied to the data. This explored whether the set of variables that made up each factor in stage 1) was reliable and consistent (i.e. to determine how closely related the variables within each factor were). This helped to identify if there were any variables that were not consistent with the others. The mean score of the variables (that made up each factor) was then created and compared against the neutral score of 4 on the questionnaire response scale using t-test. The results of the t-tests indicated whether the participant responses for the overall factor (i.e. the variables that made up each factor) differed significantly from the neutral score of how they rated the importance of the factor.

The final stage of the analysis explored the relationships between the factors created in stage 1 (factors important for innovative work behaviour development) and participation in twelve learning and innovation activities. A Binary Logistic Regression was applied to the test associations between the factors important for innovation and whether employees participated in the twelve learning and innovation activities. The focus here was on the predictive

nature of the Binary Logistic Regression (e.g. whether factors predicted activity participation, and the significance of the associations).

All three stages of the analysis were carried out on data obtained in the Scottish University and English NHS case study data. However, due to a low number of respondents, only stage 2 was carried out on data obtained from the Finnish case study. In this instance, the variables that made up factors in the Scottish and English case studies were used to create factors in the Finnish University case study (See Table 13 below).

Table 13: Stages of statistical analyses used in each case study

Analysis	Scottish case study	Finnish case study	English case study
Factor analysis to reduce 28 variables to smaller groups	X		X
Reliability testing to explore the fit of variables into the groups	X	X	X
Binomial logistic regression to explore the factors that predict participation in learning and innovation activities.	X		X

Therefore, specific details of each stage of the analysis are reported in the findings chapters in this thesis (see Chapters 5, 6 and, 7).

4.3.3.3 A comparison of case study findings

The final stage of the analysis was to compare the findings from the qualitative and quantitative data analyses in each case study. To do so, each case study was separately taken through a comparative process, which compared the themes that emerged from qualitative data collection with the relationships which emerged from the quantitative analyses.

First, the themes that emerged from the analysis of qualitative date were identified. It was then sought as to whether similar relationships emerged from the analysis of quantitative data (i.e. the analysis questioned whether the themes in the qualitative findings were also factors that predicted participation in learning and innovation activities). If this was the case, meaning to the relationships was added from the reasons that participants gave for their discussion points.

However, if there was a difference between the themes and relationships that emerged from the qualitative and quantitative analyses, an in depth exploration of the prior literature was undertaken to explore whether there may be any specific reasons for the differences (e.g. differences in methodologies or concepts studied). This helped to provide an explanation of the findings and add meaning if the findings differed from the literature.

The final stage of the analysis was to carry out a cross-case study comparison. To do so a table was created to compare the themes and relationships which emerged from each case study (see Table 34 on page 213). In comparing the three case studies together, the most important factors that influence innovative work behaviour development were identified (i.e. those that emerged from all three case studies) and others that did not emerge from all case studies were highlighted. Where factors did not emerge from the findings of all case studies, the literature was reviewed to identify whether there was an explanation of this findings (e.g. whether there could be contextual differences). In addition, the individual quotations coded in each case study were reviewed to identify any potential reasons that the participants gave for the findings.

4.3.4 Validity and reliability

A study is considered valid if the instruments used measure what they are intended to measure (Field, 2009, p.11). The validity of this research was enhanced by the use of three data collection methods as part of an exploratory multimethod approach. As a consequence, the data from the qualitative and quantitative sources were triangulated and the consistency of results were confirmed in comparison with the other data source (Denscombe, 2000, p.85).

The content validity of concepts was also addressed during interview and focus group discussions. The initial interview and focus group discussions asked participants to describe the key concepts in the thesis (see Appendix A for the interview and focus group guide) and provide their interpretations on the concepts. This content validity ensured that the understanding concepts defined and discussed in the interviews and focus groups reflected the concepts defined in this research (Salkind, 2010).

The validity of the questionnaire results was tested by comparing the findings with similar studies (i.e. those who had used a questionnaire design). This

increased the generalisability of the questionnaire findings across multiple contexts using different participants (Calder et al., 1982, p.240). For example, Chen and Huhang (2009) and Noruzy et al. (2012) detailed in section 2.4.1.3 on page 32 of the literature review both used a questionnaire to collect data from participants. The findings of both studies revealed that knowledge sharing in the workplace was vital for innovation to develop, a similar findings to this research. Therefore it can be concluded that the use of a questionnaire to collect data on this topic is appropriate and a valid method to use (i.e. to collect questionnaire data through the survey method).

In addition, the validity of the questionnaire was increased by using a previously validated scale of learning activities (Nikolova et al., 2014). The use of an already validated scale enhanced the validity of the questionnaire by ensuring the applicability of the tool across multiple settings before using it in the study (e.g. Nikolova et al., 2014).

The use of the case study approach increases the ecological validity of the study in the generalisability of findings typical to everyday life (Wenger & Blankenship, 2007). The use of three different organisational contexts overcomes challenges with social research (e.g. social psychology) where some concepts are studies using experimental design approaches as opposed to real world settings.

In respect of the generalisability of the findings, efforts were made to obtain information on the staff structure of each case study. Contact was made with the Human Resources department of the Scottish case study. However, it was not possible to obtain information on the proportions of leaders, managers and non-mangers of the university. This was also the case for obtaining information on the staff structure of the Finish and English case studies. Due to ethical concern of sharing employee-related information to external organisations, it was not possible to obtain information on the proportions of employees in specific roles in the Finish or English case studies. This reduces the generalisability of the findings of the three case studies as it is not possible to identify whether the proportions of participants sampled reflects the actual organisation structure of each case study organisation.

Reliability considerations are important to ensure the results obtained are accurate in accordance to the methods in which they were collected, and that the results obtained yield the same results if repeated (Alshenqeeti, 2014). Brewton and Millward (2001) argue of the poor reliability of interviews due to their openness to various types of bias. This can be particularly evident when the researcher aims to draw comparisons between multiple datasets. Creswell addresses this concern by indicating that many studies do not report actual reliability of studies (Creswell, 2009, p.153) but this practice does not allow for repeatability and replicability over time to be discussed (Golafshani, 2003). An aspect of this research was to compare the findings of the interview and focus group data to explore the patterns in comparison to the findings of the quantitative questionnaire. The reliability of the methods is demonstrated by the similar findings that emerged across all three case studies (which used identical study materials in data collection).

For the qualitative aspects of the study, reliability was enhanced by ensuring that all aspects of the empirical work were recorded. For example, supporting documentation was provided at all stages to record the data collection process (e.g. the interview and questionnaire questions as presented in Appendix A on page 311 and Appendix B on page 308). This helped to evidence why decisions were made and provided a cognate narrative to ensure all elements of the qualitative study (e.g. design, data collection and analysis) were traceable (Denscombe, 2000, p.213).

The reliability of the quantitative questionnaire was explored by applying the 'test-retest' method (Field, 2009). This method assesses the external validity of the tool and was used on two of the pilot study participants to assess the extent to which their answers were the same at different time points.

4.4 Research implementation

The implementation of the research designed involved three stages. First, interview, focus group and questionnaire questions were developed. Next, these questions were piloted. Finally, data were gathered. These stages are visualised in the Figure 5 below.
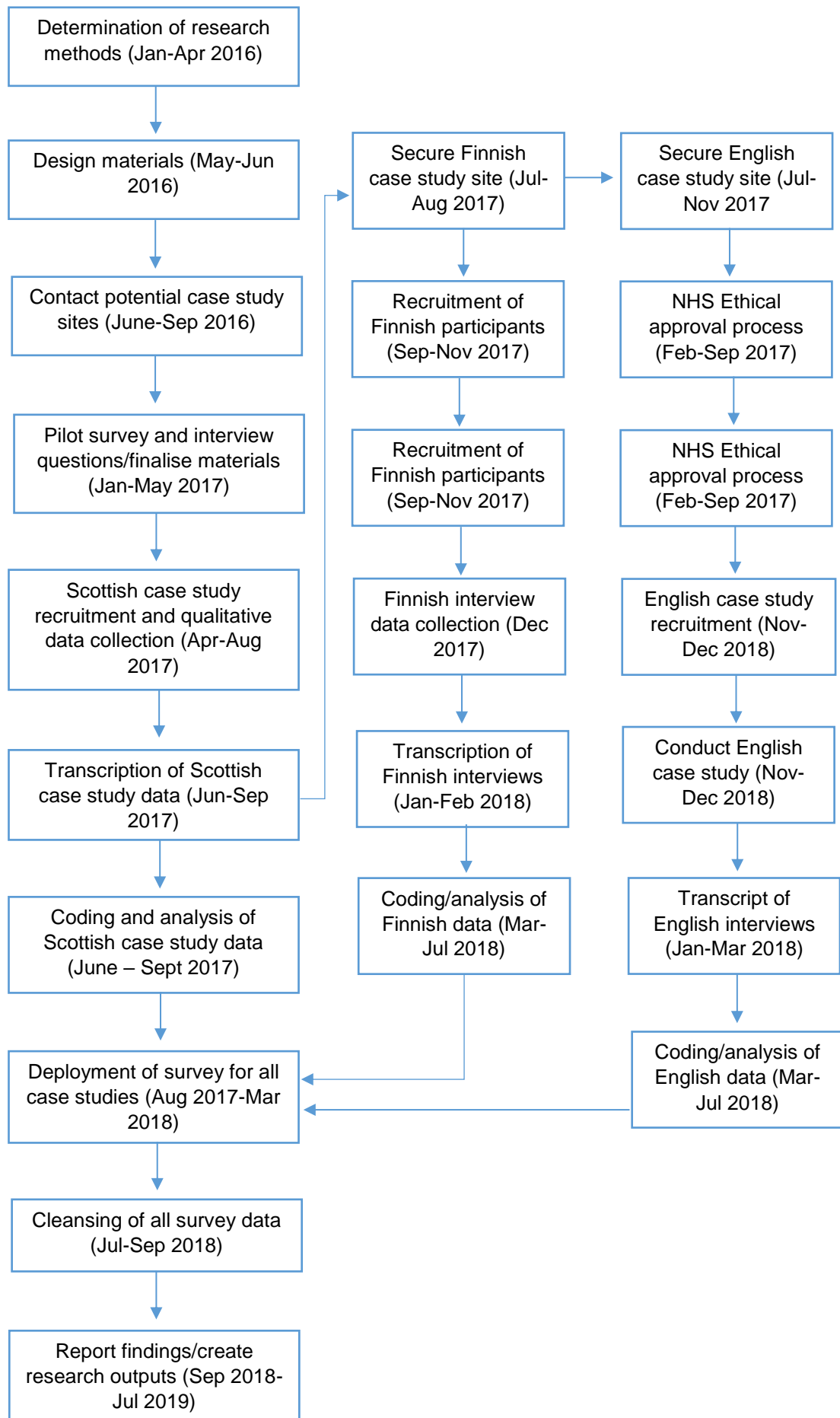
Figure 5: Stages of research implementation

The studies were designed to be identical across the three case studies and therefore only one set of materials and procedures was created. The only adaptation made to the materials was that the NHS case study participant materials (i.e. the participant information and consent form) were required to be NHS formatted. Therefore, all materials were designed in the same way as in the Scottish and Finnish case studies, but adapted during the NHS ethical approval procedure in February to September 2017 (see Appendix D on page 330). All materials were designed in May to June 2016 prior to the piloting of these materials in January to May 2017.

The running of the qualitative data collection for the three case studies was based on the time in which the case study organisations were recruited. The Scottish case study qualitative data collection began first as this was the first organisation to be recruited. At the time of this data collection, no other organisation has been formally recruited. Whilst the interviews and focus groups were being transcribed for the Scottish case study, the Finnish and English case studies were recruited. Therefore, the qualitative data collection for these two case studies began three months after the completion of the Scottish case study qualitative data collection.

The qualitative data collection (i.e. through interviews and focus groups) was not ran in parallel with the quantitative data collection (i.e. through the questionnaire). For all case studies, data were collected through interviews and focus groups first to ensure that these could then be coded and analysed whilst the questionnaire was given to the employees of the case study organisations. The decision was taken to collect the quantitative questionnaire data at the same time for all case studies, but using a separate questionnaire for each case study to enable the identification of the specific participants from each case study. The questionnaire data was therefore collected after the interviews and focus groups took place.

4.4.1 The development of interview and focus group questions

A semi-structured interview approach was adopted during the development of the interview and focus group questions (see Appendix A on page 310). The purpose of doing so was for the questions to initiate discussion as to how participants innovate in the workplace. However, for the personal experiences

of the participants to emerge, the use of a semi structured interview allowed the researcher to structure the interview partly (i.e. to answer the research questions) but allowed for elaboration and changes to discussion flow which highlighted participant experiences during the data collection process (Bryman, 2016, p.466) The use of semi-structured questions enhanced the ecological validity of the research in its context as the researcher was able clarify the viewpoints of the participants (Pickard, 2013, p.196).

The questions for the interviews and focus groups were informed by Bandura's Social Cognitive Theory. In SCT, interactions between social and cognitive factors of learning are determinants of behaviour and thus a distinctive feature of SCT (Pálsdóttir, 2013). The model of triadic reciprocal causation' highlights the three sets of factors that interplay, interact, and bear influence: (i) cognitive and other personal factors such as values, goals and beliefs; (ii) environmental factors, such as culture in the workplace; and (iii) behavioural factors such as behaviours of other employees. The structure of the questions posed as part of the interviews and focus groups served to encapsulate these relationships and aimed to highlight the inter-relations between factors that influence innovative work behaviour. The participants were specifically asked about factors that influence learning of innovative work behaviour and relationships between the factors that exist.

For the interview and focus group questions, the influencing factors were not separated (as noted in SCT) but discussed collectively. The purpose of this structure was to allow for the participant viewpoints to be at the forefront of discussion. In addition, the purpose of this approach was to ensure that the participant responses were not influenced by the theory that underpinned this research (e.g. participants were not directed to discuss environmental, behavioural and factors specifically). The purpose of structuring the discussion in this was to encourage participants to highlight a range of factors that influence innovative work behaviour and provide examples of their own workplace experiences.

Initially, participants were asked to identify the contextual factors that they felt influenced innovative work behaviour. Specific reference was made as to organisational culture and strategy as there were evident within the literature. Respondents were asked to discuss their understanding of these in further

detail and provide examples of where the factors had influenced innovative work behaviour in their own organisation (e.g. elements of the culture and strategy the participants could recall).

Bandura (1986) also recognises the value of agency in SCT. Here individual human agency is two-fold: individuals are considered dependent agents that are both *products* of the social system in which they live, as well as *determinants* of that system's production. Participants were questioned on the role of themselves and other people (e.g. leaders) in innovative work behaviour development. These discussions emphasised the role of people as initiators of innovative work behaviour and asked participants to reflect on people in the work environment (e.g. leaders) as well as their own personal contribution to innovative work behaviour development.

The development of the interview and focus groups questions was structured in a specific way to answer the research questions (see Appendix A on page 310). For example, participants were asked specifically about factors that influence innovative work behaviour and then determinants of innovative work behaviour as this information was required to answer the research questions. Additionally, evidence from the constructive perspective suggests that acquired knowledge is also due to interaction between the researcher and the researched (e.g. Casey & Goldman, 2010). Therefore, the interview and focus groups questions were structured to allow the viewpoints of the participants to emerge in relation to the research question posed as opposed to being directed by the research.

4.4.2 The development of questionnaire questions

As with the design of the interview and focus group questions, Bandura's Social Cognitive Theory was applied in the design of the quantitative questionnaire questions. The literature discussed in Chapter 2 also influenced the questionnaire design.

With the potential analysis in mind, the questionnaire was split to ask participants questions to two topics. The questionnaire asked participants to: (1) rate factors of importance to innovative work behaviour and; (2) provide information as to the frequency of participation in a list of learning and innovation activities.

For section 1, the findings of the literature review (see Chapter 2) were embedded into the questions that participants were asked. The findings of the literature review indicated that the following elements influence innovation, and therefore participants were asked to rate these based upon the importance to innovative work behaviour development:

1. Information skills of employees (section 2.4.1.2 on page 27);
2. Personal skills and characteristics (e.g. the ability to cope with change and belief in goals and strategy in the organisation) (section 2.4.3 on page 57);
3. The organisational culture and strategy (section 2.4.2.1 on page 41 and section 2.4.2.2. on page 42);
4. Provision of a suitable infrastructure by the organisational, such as access to resources, and space for collaboration (section 2.4.2.4 on page 50)

Twenty-eight individual factors were identified, and participants were asked to rate, on a seven-point Likert Scale how important they felt the factor was in innovative work behaviour development 'Not at all important' to 'Extremely important'). Social Cognitive Theory was used to ensure the questionnaire covered a range of factors which are suggested to influence behaviour (i.e. environmental, cognitive and behavioural factors).

In the second section, the Workplace Learning Activity Scale (WLA) was used as the basis of the questions. The scale is part of the larger Self-Regulated Learning at Work Questionnaire. The WLA was used as prior work has validated the use of the questionnaire across workplace contexts (see Nikolova et al., 2014; Fontana et al., 2015). A number of similar scales have also been developed (e.g. Gijbels et al., 2012). Therefore, the use of the scale in the study reported in this thesis is justified as it was suitable to apply the scale to multiple workplace contexts.

The WLA provides a list of activities that employees take part in to learn in the workplace (e.g. attend training courses, reflection on previous actions, receiving feedback from colleagues). Questionnaire respondents are asked to rate their participation on a Likert type scale ranging from 'never' to 'very often or always'. Some of the activities (e.g. working alone or with others to develop new ideas)

relate directly to innovative work behaviour and demonstrate the actions of employees if innovating in the workplace. The scale was chosen partly for this reason. However, the scale was adapted to allow the individual activities to be separated (e.g. The 'Attending a training course or using self-study materials' question was separated into two questions). Additionally, the wording of the responses was changed. This was changed to provide clarity as to the response required by the participant (see Appendix B on page 307 for the full list of questions).

4.4.3 The use of pilot studies

In May 2017, the interview and focus group structure and questions were piloted. This process was carried out with an employee from the Scottish University case study who volunteered in advance and was made aware of the purpose of the interview. After the interview, the respondent was asked to reflect upon: (1) the clarity of the definitions of key terms and time given to discuss these; (2) the understandability of questions; (3) the general structure of the interview; (4) the time given to reflect and respond to questions an; (5) any other comments relevant to the interview.

After the feedback was analysed, only one change was made. This was not to the interview and focus group structure or questions, but the prompts that participants were given prior to the interview. Instead of seeing definitions on an A4 sheet, definitions were written on four note cards and placed on the table in front of the participant during the discussions of the key terms. The cards remained on the table throughout and the participants were informed that they could ask questions about the concepts at any point of during the interview or focus group. The feedback from the pilot study indicated that this process would have helped the participant to keep the concepts in mind during discussions as opposed to recalling definitions without clear prompts when giving examples.

In January 2017 the draft questionnaire was piloted with a sample of people who were employees within public sector organisations. The link to the questionnaire was distributed on the author's private Facebook page as well as emailed to personal contacts who worked in service sector organisations. The test version of the questionnaire asked participants to provide written feedback. Feedback was requested in terms of: (1) layout of the questionnaire; (2)

structure of the question sets; (3) the ease of questionnaire completion; (3) understandability of the questions; (5) whether anything was missing or expected from questions on this topic; (6) any spelling, punctuation and grammar errors in the questions and; (7) any other relevant feedback on the questionnaire.

10 people responded to the pilot questionnaire. The feedback led to the amendment of minor typing errors and splitting one series of questions over two pages to allow participants to digest information on the first set of questions before moving onto the next set of questions. No comments were made in terms of time required to complete the questionnaire so the initial estimated time for completion was kept. To ensure the questionnaire had been completed correctly, the responses were analysed for consistency. This involved some subjective judgement from the researcher but ensured that the questionnaire had not been completed in a random fashion by participants.

4.4.4 Identification of the case study organisations

Initially, contact was made with the Edinburgh Napier University placement coordinators to obtain a list of organisations and contacts who may be approached to participate in this research. Ten organisations were contacted in the first instance, and only one responded. This was a private Information Services organisation located in Scotland. However, after several attempts to arrange meetings with this organisation to discuss the research, the communication was stopped as the contact failed to respond to further messages.

The next stage of case study organisation identification was to make connect prior research and education contacts. Two potential private service organisations were identified and contacted directly (i.e. formal emails were sent to the main contacts directly). However, only one responded. Study information and requirements of participation in this research were sent to the case study contact, who initially agreed to participate. However, due to work commitments of employees at this site, the contact withdrew agreement to participate prior to making any formal agreement.

The decision was taken to target public organisations as opposed to private organisations due to the failure in securing any case study sites. The decision

was made to contact several publically funded service organisations, four of which were contacted. From this communication, only one publically funded organisation agree to take part in the research and proceeded to make formal arrangements. This was the Scottish University.

As there was the need for comparable case studies, a Finnish University was approached directly through an academic contact. This contact approached the senior leadership team of the university to seek advice on participation and formally agreed to take part in this research. This meant that there were at least two case studies for this research.

The third case study site was not sought directly. Contact was initially made through Twitter where the contact of the NHS Trust was informed of the recruitment for this research by a local conference delegate. Initial discussions took place over Twitter as to the aim of the study, and a more formal discussion process took place over email where study information and purpose of recruitment was given. Permission was sought from senior leaders within the NHS Trust as to the recruitment of NHS staff for this research so that the process of ethical approval could begin.

4.4.5 Data gathering for the interviews and focus groups

The data gathering process for all case studies were similar but not identical. The data gathered from the participants in the Scottish case study comprised data from interviews and focus groups as opposed to interviews only in the Finnish and English case studies. Interviews and focus groups were chosen for the Scottish case study only as there was easier access to this organisation to arrange focus groups with employees and there was a larger time frame for data collection where the focus groups could be arranged. In comparison, the interview data was collected in a short pre-arranged time frame which made it difficult to organise focus groups.

In all case studies the study was advertised by email for all case studies. A contact within each case study was used to send study information (supplied by email) to professional services mailing lists to widen the reach of potential participants. For the Scottish and Finnish University data gathering, the main research contact for this research was copied into emails (sent by the employee

contact in each case study organisation) to allow for the exact distribution of the study advertisement to be seen.

It was not possible to obtain information on the exact distribution lists in which the emails were sent in the English NHS Trust meaning the reach of the questionnaire link to employees of the NHS Trust is unknown. This is because data protection regulations prevented the NHS contact from copying the researcher of this research into emails sent to distribution lists and individual employees due to the risk that personal and identifiable information would be unnecessarily disclosed (e.g. names and email addresses of those who did not wish to take part). The strengths and weaknesses of the methodical approach are reported in the Discussion chapter of this thesis (see Chapter 9, section 9.4 on page 259).

The differences in data gathering across all three case studies are summarised in Table 14 below.

Table 14: Differences between data gathering in the three case studies

Element of data gathering	Scottish case study	Finnish case study	English case study
Data collection by interviews	X	X	X
Data collection by focus groups	X		
Participant recruitment with researcher involved (e.g. copied into study advert emails)	X	X	
Recruitment emails with researcher not involved (i.e. contact sends emails independently)			X

In all case studies, the study information was sent to all potential participants by email and gave the aim and objectives of the study alongside expectations of participation. The study information asked those interested in the research to contact the researcher directly to ask further questions, or arrange a suitable time or place to participate. This was the instruction regardless of case study organisation to allow the date and time of interviews and focus groups to be pre-arranged.

All interviews were conducted face to face on the site of each organisation. The length ranged from 30 to 60 minutes. All interviews were semi-structured to encourage the participants to elaborate on their answers and give examples where necessary (Barriball & While, 1994, p.330). A copy of the interview and focus group schedule (see Appendix A on page 310) was used as a guide during the interviews.

The focus groups were also conducted face to face and on site of the Scottish University. The length ranged from 45 minutes to 75 minutes. The structure was identical to that of the interviews noted above. The only difference was that mediation between group members took place when viewpoints were not agreed upon, or when conversations diverted away from the main discussion topics of the research. This is a particular characteristic of focus groups as noted by Pickard (2013, p.243), which helps to keep the focus group conversations relevant to the research. The sampling techniques used for each case study are reported in sections 4.5.7 (page 111), 4.5.8 (page 116) and, 4.5.9 (page 120) below as these differed for each case study.

4.4.6 Data gathering for the quantitative questionnaire

For each case study, the data gathering procedure for the questionnaire was similar, but not identical. The procedure was identical for the Scottish and Finnish Universities. However, for the English NHS Trust, it was not possible to send direct emails to potential participants and a contact with the NHS Trust was used.

For the Scottish and Finnish Universities, the sampling strategy targeted the whole cohort of non-academic employees in the Scottish and Finnish Universities. This served to maximise the independent variable variance (Punch, 2003, p.37-39). To achieve this, the whole population of non-academic employees were targeted. This was because a larger sample would increase the change of the relationships between variables being visible (Punch, 2003, p.38).

An email link was created with the online questionnaire. This link was sent to all employees on non-academic staff mailing lists in the Scottish and Finnish Universities. The email contained brief study information and details of how employees could participate and withdraw if necessary. The questionnaire link

was sent at three time points: once at the start of recruitment, once during recruitment and once towards the end of recruitment as a reminder of questionnaire completion.

For the English NHS Trust, a contact with the Trust was used to send emails with the questionnaire link attached. For the same reason as noted above, it was not possible to obtain information on the exact distribution lists in which the emails were sent.

4.4.7 Case study origins: The Scottish case study

Data were collected from a publicly funded university in Scotland. At the time of data collection, students studied across multiple campuses located within the city. The university comprised several academic schools, each with specialisms in terms of research and study programmes offered. Various support services were offered to students and staff across the university (e.g. academic support, admission support, school support and, wellbeing support). At the time of data collection, around 900 staff non-academic staff alongside approximately 650 academic and research staff were employed at the university.

This university was chosen as a case study for this research due to the strategic focus of the university. Innovation was at the heart of the values that encapsulate the university strategy. The strategic vision of the university was to improve on the innovative capability of the university by encouraging employees to innovate. The aim here was to support employees to innovate by providing multiple opportunities to exchange knowledge, engage with others and maximise the use of resources and people within the university. At the time of data collection, the university had adopted a continuous improvement approach to service delivery and promoted a learning environment to encourage the innovative mind-set required from employees and graduates. For this reason, the improvement of employee-led innovation was a key focus of the university strategy and the university was taking steps to improve innovation at the tie of data collection (e.g. through promotion of the values and expectations from employees). Additional information on the context to the Scottish University is reported in Chapter 5, section 5.2.1 on page 124.

4.4.7.1 Sample for the interviews and focus groups

Qualitative methods aim to reflect diversity in a population. This is achieved by recruiting participants using purposive sampling (Barbour, 2001, p.1115). A specific type of purposeful sampling called 'maximum variation sampling' (Palys, 2008, p.697) was used to source the participants for the interviews in the Scottish university case study. Participants were sought to reflect a variety of characteristics within the Scottish University (e.g. age, gender, ethnic background, length of service, role and service). All participants were non-academic employees of the university (e.g. those in professional services). They were chosen (rather than academic employees) as academic staff were more likely to discuss how they teach and their innovation practices may differ from employees who are non-academic. The innovative work behaviours of academic staff could differ from those of professional services due to job role expectations. Therefore, focusing on one sample increases the validity of the study.

Between April 2017 and August 2017, fifty-nine employees were recruited from the Scottish University to participate in either an interview or a focus group. Employees were asked to identify their employment rank from the following definitions:

1. A leader – an employee with full responsibility of a service or area or;
2. A manager – an employee with some leadership responsibility (e.g. management of other employees) but who do not have full responsibility of a service or department ort;
3. Non-managerial employee – an employee with no leadership or managerial responsibility as part of their roles.

The number of recruited participants is given in Table 15 below.

Table 15: Number of participants sampled for interviews and focus groups by employment rank

Data collection method	Employment Rank		
	Leaders	*Managers*	*Non-managerial employees*
Interview	9	7	17
Focus group	0	10	16

A variety of leaders, managers and non-managerial employees were sampled to reflect the hierarchical structure of the university. It was not possible to determine whether the sample reflected actual proportions of leaders, managers and non-managerial employees within the university.

9 participants were leaders of a service or department, 17 were managers and 33 were non-managerial employees. This yielded a total of 33 interviews and 26 participants for focus groups (six groups of three employees and two groups of four employees).

To reduce bias in the sampling of specific departments within the university, the department of work for each participant was recorded. The participants were sampled from across all ten departments and services in the university (e.g. Human Resources, Research and Innovation Services, Information Services, Support Services).

Table 16: Departments included in the research sample and total participants from each

Department or service	Leaders	Managers	Non-managerial employees
Human Resources	2	3	4
Student recruitment	1	-	-
External Relations	1	4	-
Communication Services	1	-	-
Student Education Support	1	3	5
Learning and Teaching Support	1	1	-
School and departmental admin support	1	3	12
Research Support	1	3	4
Information Services	-	-	7
Properties and Facilities	-	-	1

The sample included a combination of leaders, managers and non-managerial employees from each department where possible (see Table 16 above). This was done to ensure that viewpoints of the participants reflected the variety of professional service departments within the university.

16 participants were male and 43 were female. Details of individual participant characteristics, including employment rank, department of employment, gender and method of participation are available in Appendix C on page 327. Each participant as also given a unique code for reference within the participant quotations in this chapter.

A full profile of each participant in the Scottish case study is in Appendix C on page 317.

4.4.7.2 Sample for the questionnaire

Between January and June 2018, a total of 205 participants completed the questionnaire, either in part (n=83) or in full (n=122). 33.7% (n=46) of the questionnaire participants were male and 62.3% were female (n=76). Participants identified themselves as part of a variety of age groups, ranging from age 16 to age 64. The largest age group was age 35-44 (n=36) followed by age group 45-54 (n=33). Nearly 40% of the participants were aged either 25-34 (n=27) or aged 55-64 (n=20).

46.7% of participants (n=57) identified themselves as White British followed by 43.4% of participants (n=53) who identified themselves as White Scottish. The remaining 11 participants identified themselves as 'other'.

Employment information was also sought from participants (see Table 17 below).

Table 17: Employment characteristics of the questionnaire sample (including percentage of sample)

Employment characteristics					
Employment Rank	**Leader**	**Manager**	**Non-managerial employee**		
Count (and percent)	11 (9%)	31 (25.4%)	80 (65.6%)		
Highest Qualification	**School College**		**University (under-graduate)**	**University (post-graduate)**	
Count (and percent)	26 (20%)		42 (34.4%)	54 (44.3%)	
Length of Service	**Less than 1 year**	**1-2 years**	**3-6 years**	**7-10 years**	**10+ years**
Count (and percent)	20 (16.4%)	27 (22.1%)	32 (26.2%)	10 (8.2%)	33 (27.1%)

It is evident that the sample of leaders, managers and non-managerial employees reflects their hierarchical structure of the university. For example, there were nearly three times the number of managers (n=31) in the sample to that of leaders (n=11). There were over double the amount of non-managerial employees (n=80) compared to managers (n=31). However, as noted in section above it was not possible to specifically identify whether the proportions of employees are representative of the full university employment structure.

Additional information on qualification levels and length of service were collected and used in the analysis of quantitative data (see Chapter 5, section 5.4.1.2 on page 144 as an example from the Scottish case study). The highest qualification held by participants was a postgraduate university qualification (n=54, 44.3%). 34.4% of employees (n=42) held an undergraduate university qualification as their highest. Just over 20% of employees indicated that their highest held qualification was either completed at school or college (n=26).

The percentages of participants in the groups for length of service were similar except for those who had served between 7-10 years (n=10), which was substantially lower in percentage compared to all other groups. 16.4% of participants (n=20) had been employed within the university for less than one year and 22.1% had been employed for 1-2 years (n=27). 26.2% of participants indicated that they had been employed in the university for 3-6 years (n=32) which was similar to the 27.1% of participants who had been employed in the university for 10 or more years (n=33).

4.4.8 Case study origins: The Finnish case study

Finland was chosen as a location for the second case study due to the increased innovation activity within the country. Between 2014 and 2016 Finland had 65% of its economy classified as innovative enterprises (European Commission, 2018). This figure was high, and placed Finland third highest in the rank of percentage of innovative enterprises in 2016. The statistics from the *2016 Community Innovation Questionnaire* indicated that the share of innovative enterprises had increased by 10% from 2012-13 to 2014-16 (European Commission, 2018). 21% of employees in Finland (aged 18 to 74) were employed within the service sector in 2015 (Official Statistics Finland, OSF, 2015) making Finland a suitable comparison country to Scotland in terms of the service sector.

Data were collected from a publicly funded university in Finland. The university was founded in the early 1900s and at the time of data collection comprised four main faculties specialising in specific taught and research degrees for around 7,000 students. Additional to the university faculties, several support services operate within the university (e.g. Education and Research support). The purpose of these services is to support the academic employees and students in their work. The support services were a focus of the data collection in this research.

The university was chosen to be part of this research due to the strategic vision. At the time of data collection, the strategy was employee-focused and aimed to improve the skills of employees, operating through values of openness, and an encouraging participation from employees. The focuses here was of employee development, a key area of this research.

The university was also chosen due to the availably of access to the site. The university was initially recommended through a contact at the Scottish University, who offered support for the researcher to make initial contact.

4.4.8.1 Sample for the interviews and focus groups

The same sampling technique was used to gather data as in the Scottish University (see section 4.4.6.1 on page 105 of this chapter).

A contact within the university also advertised the study via email and asked participants to contact the researcher directly to arrange a suitable time and location for an interview.

As the location of the case study organisation was in a different county to researcher, some additional condensations were made:

1. The study information and interviews were conducted in English. It was a requirement that all participants spoke English as a first or second language to eliminate language related issues;
2. The study information was sent in September to November 2017 and this included dates to when the researcher would be visiting Finland;
3. The interviews were arranged in advance of the data collection in December 2017.

Twelve interviews were arranged for December 2017 during a fourteen day visit to Finland. It was not possible to organise focus groups for the Finnish case study due to time and location constraints, and the employment commitments of participants. Therefore, only interviews were arranged.

Participants were 3 leaders, 3 were mangers and 6 were non-managerial employees. There were 2 males and 10 females in the sample. Participants were sampled from six main departments: Finance, Student Support, Research Support, Education Support, Communications and, Library and Information Services.

The characteristics of the sample are given in Table 18 below.

Table 18: Participant information for Finnish case study

Participant (and code)	Employment rank			Service of employment						Gender	
	Leader	Manager	Non-managerial employee	S1 Finance	S2 Student Support Service	S3 Research Support Services	S4 Education Support Services	S5 Communi-cation	S6 Library Service	Male	Female
P72 (LS3)	X					X					X
P73 (NMS3)			X			X					X
P74 (NMS5)			X				X				X
P75 (LS3)	X					X				X	
P76 (MS5)		X							X		X
P77 (NMS5)			X						X		X
P78 (NMS5)			X		X						X
P79 (NMS5)			X					X			X
P80 (NMS5)			X				X				X
P81 (MS3)		X				X					X
P82 (MS5)		X					X				X
P83 (LS1)	X			X						X	

4.4.8.2 Sample for the questionnaire

Between January and June 2018, a total of eighteen participants completed the questionnaire either in part (n=3) or full (n=15). The response rate was lower than that of the Scottish University. It is suspected that this is because the questionnaire was distributed during academic term time where employees often have a tight schedule for task completion. The questionnaire required participants to be English literate and some employees may not have felt confident with their understanding of the topic.

As part of the questionnaire, participants were asked to provide demographic information including age group, gender and, ethnic background. The reporting of participant demographics does not include numbers where groups included ten participants or less. This is to reduce the possibility of identifying participants from their demographic characteristics.

Approximately two thirds of the questionnaire participants were female and one third were male. Participants were aged between 16 and 64 (12 were aged 25 to 45). 12 participants identified themselves as 'other' ethnic background (e.g. Finnish, Nordic, Caucasian and White).

Participants were also asked to indicate their employment characteristics for use during the analysis. It is evident that the sample of leaders, managers and non-managerial employees reflected the hierarchical structure of the university. For example, there were four times the number of managers in the sample to that of leaders. There were over double the amount of non-managerial employees compared to managers.

The highest qualification held by participants was a postgraduate university qualification followed by an undergraduate university qualification. Nearly half of participants had worked in their organisation for more than ten years. Just over a quarter had worked in their organisation for less than one year. The reminder of the participants had worked for the organisation between one and ten years, with varied lengths of employment.

4.4.9 Case study origins: The English case study

Data were collected from an NHS Trust based in England. The Trust was established in the early 1990s and developed into a wider foundation some years later. The Trust provides a variety of hospital based and community care

services to the local community across multiple medical sites. This comprises several medical centres, primary care centres and a man hospital located within the Trust.

At the time of data collection, this particular NHS Trust focused on innovation. The strategic plan was developed to improve innovation as a whole Trust but also focused on the improvement of innovation from employees. The Trust had actively taken steps to improve collaboration between other local NHS Trusts and academic institutions to help to promote and develop innovation from employees. As with many NHS Trusts, there was a specific research and innovation department. The focus here was to support employees to champion and implement ideas once created. For these reasons, the Trust was deemed suitable as a case study site as it was activity taking steps to promote innovative work behaviour. It was assumed that employees (as potential participants) may take further interest to participate in the study and that leaders within the Trust would take interest in the outputs of the study reported in this thesis.

The English NHS Trust was also chosen due to access to the site. Initial contact was made with the Research and Innovation Service of the NHS Trust through social media where initial interest was presented by the researcher. Following this, the process of site access and ethical approval were agreed upon to secure the site for data collection.

4.4.9.1 Sample for the interviews and focus groups

An opportunistic sampling technique was used to recruit participants for the English NHS case study. The difference in sampling technique compared to the university samples was due to the lack of contact with advertising with study to potential participants.

A contact with the NHS Trust was used to advertise the study to employees within the Trust. The contact agreed that they would send the approved study advertisements (see Appendix D on page 320 for the full approval process) by email to employees and mailing lists within the Trust. Additionally, the contact agreed to advertise the study through pre-approved poster study advertisements which were agreed to be placed around the site. There was no way to assess the extent to which the study had been advertised fully

throughout the site except for communicating with the NHS contact as to the advertisement requirements. This could be a reason for the difficulties in participant recruitment.

The data collection was scheduled to take place in January 2018, on site of the NHS Trust. By December 2017, no participants had been recruited. As it was not confirmed as to the extent of the study advertisement, a convenience sampling technique was then deployed. Repeated contact was made with the NHS contact to arrange interviews for the time the research visit was scheduled. At the time point of the visit, half of the interviews were arranged (at a pre-arranged time and location as agreed the potential participant and the NHS contact). Only the names of the interested participants were disclosed at this point. Due to data protection regulations, no email addresses were shared which meant that no prior contact with participants was given. All other participants were recruited by the contact of the researcher on the days where the researcher was scheduled to visit.

During the one week visit in January 2018, twelve participants were recruited for interviews. The sample of interview participants were taken from one site of the English NHS Trust. At the time of data collection, there were 29 departments (specific to the medical care required by the patients) and several additional professional services (e.g. Research and Innovation, Library and Information Services, Facilities and Human Resources). The participants volunteered from six main departments and services (see Table 17 below). In total, 2 leaders, 3 managers and 7 non-managerial employees participated in interviews. 5 of the participants were male and 7 of the participants were female. As it was not possible to obtain information on the employment structure, it is unknown as to whether the sample are representative of the characteristics of the whole NHS Trust.

Table 19: Participant information for English NHS Trust case study*

Participant (and code)	Employment rank			Service of employment						Gender	
	Leader	Manager	Non-managerial employee	S1 Innovation Services	S2 Research Services	S3 Library and Information Services	S4 Doctor	S5 Nurse/ Medical Assistant	S6 Admin	Male	Female
P60 (MS1)		X		X							X
P61 (MS2)		X			X						X
P62 (NMS6)			X						X		X
P63 (NMS2)			X		X						X
P64 (NMS5)			X					X		X	
P65 (NMS2)			X		X					X	
P66 (NMS3)			X			X					X
P67 (MS3)		X				X					X
P68 (NMS6)			X						X		X
P69 (NMS4)			X				X			X	
P70 (LS4)	X						X			X	
P71 (LS4)	X						X			X	

*Either the Role or Service of the employment is given in this table to avoid giving details that could identify participants.

4.4.9.2 Sample for the questionnaire

Between January 2018 and June 2018, a total of 104 employees completed the questionnaire either in part (n=32) or full (n=72).

Participants were asked to provide demographic information including age group, gender and, ethnic background. A total of 72 participants completed this section of the questionnaire. Of the 72 participants, 25.0% (n=18) of the questionnaire participants were male and 73.6% were female (n=53). Participants identified themselves as part of a variety of age groups, ranging from age 16 to age 64. The largest age group was age 45-54 (n=18) followed by age group 35-44 (n=18) and age 25-34 (n=17). Nearly 20% of the participants were aged 55-64 (n=27) and one participant was aged 16-24.

55.8% of participants (n=58) identified themselves as White British. The remaining participants identified themselves as 'other'. The information here has been grouped together to avoid breaching confidentiality and breaking anonymity of the respondents where responses of each specific category were low (e.g. one or two).

Employment characteristics of participants were collected in the questionnaire. There were more non managerial employees (n=45) compared to managers and leaders (n=27) who completed the questionnaire.

The highest qualification held by participants was a postgraduate university qualification (n=46, 63.9%). Participants indicated that 15.3% (n=11) held a school or college qualification as their highest.

The majority of respondents had been employed in their organisation for more than ten years (47.7%). The remaining participants were roughly even in the groupings with 16.7% of participants indicating that they had been employed for 0-2 years, 22.2% for 3-6 years and 13.9% for 7-10 years.

4.5 Ethical considerations

The empirical work received full ethical approval from Edinburgh Napier University for data collection to be undertaken at external sites.

There were then three separate ethical approval process for each of the case studies. Approval was granted to undertake the research in all three organisations. It was important to seek ethical approval from all three organisations because:

- The approval demonstrates a risk assessment has taken place and measures have been considered to reduce risks;
- The participants of the study will be at minimal, or no risk, during participation (participants are caused no harm and their identified remain confidential);
- The findings of the research are discussed and disseminated appropriately.

The field work in the Scottish University and the Finish University required internal approval (i.e. from university leadership staff). Both involved providing the leadership teams with study information, data collection plan and a self-assessment of any potential ethical risks. However, the ethical approval process for the English NHS Trust different from the university setting as this required *external* approval from the Health Research Authority.

This requirement for ethical approval of research carried out with the NHS was a new procedure designed to improve the quality of research within the NHS. The procedure required for all research being carried out in an NHS Trust in England regardless of where the researcher is based. To apply for ethical approval, there were three stages to this process. These were:

1. A research passport application was submitted for the researcher to be approved as a researcher in the NHS;
2. Submission of online forms and supporting documentation to the Health Research Authority through an Integrated Research Application System;
3. Submission of local study documentation to the NHS trust (e.g. example participant information, consent forms, questionnaire questionnaire).

A full overview of the ethical procedure and required documentation is detailed in Appendix D on page 330.

4.5.1 Informed consent

Informed consent is important to educate potential participants as to their role in the work, the impact the research may have on them and, to provide an opportunity to refuse participation or withdraw from the research. Participation in social research "should be voluntary and as fully informed as possible" (Social Research Association, 2003, p.14). Various measures where therefore taken to ensure that this was the case for employees who took part in the data collection process, regardless of the process for ethical approval. In terms of recruitment, participants were notified of the study in advance and were able to make an informed decision as to whether they would like to participants. For all case studies, a gatekeeper was used to promote the study (i.e. an employee of the organisation distributed study information and a request for volunteers where it was not possible for the researcher to do so). At this point, the details of the project and nature of participants were fully disclosed. Those interested in the study were asked to contact the researcher directly to seek further information is required, or to volunteer to participate.

The date and time of the interview or focus group was arranged in advance. This was important so that the participants could make any arrangements to reschedule their own work or arrange their participation at a time where this would not negatively impact their work. Each participant was required to give informed consent before any discussion took place. Participants were asked to read and information sheet which outlined the purpose and nature of the questions they would be asked. The information also emphasised that their participation in the project, and responses, were completely voluntary and they could refuse to answer questions at any pint of request to withdraw from the project if required. These points were then verbally reiterated to participants, who were then asked to confirm their understanding orally before providing a written signature for consent. Through this process, oral compliance was sought as a method to determine whether participants' involvement was genuinely voluntary (Varnhagen et al, 2005, p.38). This was done subjectively by the researcher.

For the questionnaire, informed consent was gathered electronically. Respondents were required to read an informed consent notice and provided consent by ticking a box to indicate their understanding of the requirements and

terms of their participation. An additional box was ticked to indicate that consent was given, and this took the participants to the first part of the questionnaire. If the participants did not give full consent, the questionnaire automatically directed to a final screen which thanked participants for their help with the project. The information and questions for consent were presented in a question and answer format to make it as understandable as possible.

4.5.2 Anonymity and confidentiality

It is important to protect the identity of participants to ensure there is no risk of identification in relation to the data collected. To ensure the anonymity of all participants, measures were taken to remove any personal or identifiable information. The transcription of the interview and focus group recordings were done so that no individual participants could be identified. This included the removal of any names and personal information that could identify participants. In addition, all identifiable information was removed from quantitative data (e.g. IP address). In the data analysis stage, no personal information was used. No cell in any table was reported if the cell contained less than ten individuals, including participant demographics reported in this chapter. This was done to prevent identification of participants through a combination of variables. When reporting any findings, this was done in summary form (e.g. as a summary report to the case study participants) or with the removal of any personal or identifiable information. No quotations were used in any of the summary reports to eliminate the risk of identification of participants. To maintain anonymity of the case study organisations, no names of employees or organisations were given in any research output (e.g. blog posts associated with the thesis, conference papers published on research findings), including this thesis. This also means that the study was not advertised on any social media sites of the case study organisations.

To keep all participant data safe, the data gathered during empirical work was stored and worked on using a password-protected computer at Edinburgh Napier University on an encrypted research data drive. A backup of the data was kept off site. This was stored on an encrypted and portable hard drive and stored in a safe, locked location.

4.5.3 Reporting of accurate findings

A final consideration of the study was to ensure that the findings from data analysis were reported accurately and were not misrepresented in any way. This consideration is important to ensure that the data reported is accurate and truthful of the responses of the participants. Precautions were taken to ensure findings were reported comprehensively and accurately to ensure practical recommendations are supported by the research results (e.g. summaries of the findings of the three case studies were reported separately and then collectively as part of the whole project). This also included the reporting of less positive findings. However, as noted above, no case study details were related to these findings.

It is also important to consider the accuracy of individual participant responses in the reporting of research findings. During the informed consent, all participants were informed that they could contact the researcher for a summary once the analysis and write up had taken place. This provided the participants with the opportunity to review their own interview or focus group for any errors if they wished to do so.

4.5.4 Methodological limitations

The research reported in this thesis has several limitations. For example, although a detailed description of innovative work behaviour development was developed through conducting three case studies of different organisation, little attempt was made during the analysis to quantify the specific frequency of occurrences where participants discussed a certain topic. This is common in qualitative studies (Atieno, 2009, p.17) where it is often only possible to give a general overview of the proportion of participants in a study who discussed an overarching theme as opposed to specific examples.

Another methodological limitation of the study is the reduced generalisability of case study findings. The purpose of the study was to highlight contextual differences in innovative work behaviour development. However, as with many qualitative studies the findings of the qualitative elements of the individual case studies cannot be directly extended to wider populations with the same degree of certainty of quantitative studies (Atieno, 2009, p.17).

The method of participant recruitment for the English NHS case study poses a limitation. As an external person to the NHS Trust, the researcher had no control over the reach of study advertisements. As a consequence, bias could be presented in the recruitment of participants. The sample was derived on an opportunistic basis (i.e. through participants who were available during the time scale of the data collection) as opposed to purposefully using other sampling techniques (Ezzy 2002; Mays & Pope, 1995). For example, although communication was made between the main NHS research contact and the researcher as to where the study would be advertised, the researcher was unable to evidence exactly where the study was advertised and whether the advertisement had the potential to reach all employees on the case study site. This meant that maximum variation in sampling may not have been achieved (Baum, 2002, p.176) as the researcher was prohibited from being involved in the advertisement process. This was not the case for the data collection within the Scottish and Finnish University case studies where the researcher was either copied into emails, or shown emails sent to specific mailing lists to advertise the study to employees of the entire university.

There was also a short data collection window for the Finish and English case studies. This is because there was a requirement that the interviews were pre-arranged to allow for travel time to the location to be accounted for (e.g. booking of trains and flights). This could have impacted the data collection as there may have been scope for further interviews had there been a greater data collection window. Although the participants of these studies were given the opportunity to member check their interview transcripts, no participant took up this opportunity. If there had been a greater data collection and validation window, there may have been the possibility to send all transcripts to the participants for checking and to include this as part of the interview procedure. As for the quantitative questionnaire, the findings cannot be considered truly representative of the entire case study organisations. This is because the number of participants for each questionnaire was much lower than the total employees of the organisations and the attrition rates of questionnaire completion were high. A clear bias towards employees of a White British and White Scottish background in the Scottish University case study is seen in Section 4.4.6.1 on page 105, whereas the proportions of diversity of ethnic background are much higher. It is

also not possible to disclose the demographic information specifically for participants of the Finnish case study questionnaire due to low participation numbers and the need to maintain anonymity of participants. Additionally, In the English NHS case study sample, nearly 50% of the respondents had worked for the NHS trust for over ten years and this does not capture employees who may be new trainees.

A final limitation of the questionnaire analysis is that a small proportion of the statistically significant results are likely to due to change (Field, 2009). Although it was not possible to carry out significance testing on findings of the Finnish case study questionnaire due to low response numbers, there are a substantial amount of significant results reported in the other case studies and some of these results will be due to chance.

4.6 Conclusion

The pragmatic research approach using aspects of the post-positivist research paradigm unpins this research of innovative work behaviour development in multiple workplace contexts. The methods described in this chapter allowed for this research to investigate employee perspectives on how the learning of innovative work behaviour takes place. Three sets of data were collected using a case study design. The combination of data collection through interviews, focus groups and quantitative questionnaires enhanced the triangulation of research findings and the validity of participant responses. The collection of data in three different sites: a university in Scotland, a university in Finland and, an NHS Trust in England allows for the contextual differences in innovative work behaviour to emerge and be compared. This approach provided the opportunity to present a picture of the development of innovative work behaviour in three organisations and the factors that influence such development for employees. The deployment of Social Cognitive Theory (Bandura, 1986) to underpin the development of study materials and analysis services to explain the factors that enhance innovative work behaviour and the interactions between the factors that are present. Thus, the approach and methodology deployed as part of this research was sufficiently robust to generate useful research findings. These findings help to illustrate the significant factors that determine and inhibit innovative work behaviour well as

explore the examples of good practice of innovative work behaviour as noted in discussions with the study participants.

Chapter 5: Findings from Scottish case study

5.1 Introduction

The findings from the analysis of data collected from interviews, focus groups and a quantitative questionnaire implemented in a Scottish University are presented.

The sample comprised fifty-nine interview participants. Two hundred and five participants completed the questionnaire (see Chapter 4, section 4.5.8.1 and 4.5.8.2 starting on page 118 for a full description of the sample). The interviews and focus groups were semi-structured in design and underpinned by Bandura's Social Cognitive Theory (see Chapter 3, section 3.1.1. on page 70). Similarly, the design of the quantitative questionnaire was informed by the literature that underpins this thesis (Chapter 2) and a validated scale of workplace learning (e.g. Workplace Learning Activity Scale, Nikolova et al., 2014).

The chapter begins with information on the context to the Scottish case study (section 5.2.1) and is followed by a discussion of the main themes that emerged. These are:

1. The role of information literacy in the development of innovative work behaviour (section 5.3.1);
2. Specific information behaviours that contribute to the development of innovative work behaviour (section 5.3.2);
3. The culture of the organisation (section 5.3.3);
4. Leadership and leaders within organisations (Section 5.3.4) and;
5. Individual skills and abilities of employees (section 5.3.5).

The findings from the quantitative questionnaire are then presented in the final section (section 5.4) followed by a conclusion to the chapter (section 5.5).

5.2 Context to the case study setting

In this section, additional information about the context of the Scottish case study, a Scottish University, is provided. This includes details of the strategic aims and direction and steps taken in relation to innovation.

5.2.1 Context to the Scottish University

The Scottish university was publicly funded and was situated across multiple campuses within a Scottish city. It comprised over 15,000 students and employed over 1000 staff, in both academic and non-academic roles.

The university was around 60% through a 2020 strategy directed towards innovation. The values of this strategy served to highlight the active approaches to learning used for student and staff development. The focus here also included innovation. A particular element of the values was to empower employees to innovate through processes of staff engagement, leadership, communication, and for the university to promote a culture in support of employee development and innovation. The culture and the strategy were informed by a series of principles and objectives. These worked to ensure that the university was directed by academic priorities, focused on student engagement and success, developed relationship with international and local partners within academia and industry. The objectives sought to improve and maintain the academic reputation and student experience, focus on international organisational development and build innovation, enterprise and citizenship. The central role of innovation within the university was educational in nature and outcomes sought to promote an innovative approach to teaching, knowledge exchange and the engagement of business and enterprises in student experiences and learning.

The strategy aimed to ensure that staff develop skills contributed to their own personal and professional development whilst they support students to achieve the best. The strategy did so by promoting a continuous improvement approach to service delivery, which aimed to inspire employees to challenge current thinking, processes and policies.

5.3 Themes that emerged from the analysis of interview and focus group discussions

The purpose of the interview and focus group discussions was to explore the factors that contribute to the development of innovative work behaviour and explore determinants of such development. The interviews focused on how the participants, as employees of the organisation, learned develop innovative work behaviour in the workplace.

A thematic analysis was carried out on the data collected through interviews and focus groups together as opposed to separate analyses for each. This was to allow for a comparison of qualitative findings at case study level.

Five main themes emerged from the discussions with the participants (see section 5.1 on page 121 above). The sections that follow report details of the themes that emerged.

5.3.1 The role of information literacy in innovative work behaviour development

The interview and focus group participants of this case study discussed the contribution of information literacy to innovative work behaviour development. Discussions centred on the role of information literacy in the initial stage of innovative work behaviour. Twenty-five out of fifty-nine participants explained that information literacy is an initiator of workplace learning as, in their opinions, it: (1) helps employees to identify the gap in information and knowledge they need to fill to learn and create new ideas; (2) helps employees to set a context to the future information needed and; (3) helps employees to look at the types of information they need to fill the identified information or knowledge gap (i.e. it helps employees to acquire new knowledge to innovate). This indicates that innovative work behaviour is a product of the process of learning new information and knowledge. Here, innovative work behaviour occurs once employees identify where additional information is needed. For example, one of the interview participants said:

> "It's a sensible starting point to understand that you need to learn something which is the first bit so identify a gap and then find a means of filling it." (P4, LD7I: 457-459)

Information literacy is also an essential skill to support workplace learning. Employees use the information for innovative work behaviour once they give meaning to the information before they use information in tasks. However, participants in this research felt that employees need to understand the sources of information (e.g. where they can seek information) and actions required to facilitate the process of innovation once learning has taken place. For example, P24 said:

> "I think the conversation we had around change and innovation means that you need to have a real understanding of where you can go and find information and also how you can use that information to your best advantage in order to fulfil your wider objectives." (P24, MD5I: 648-652)

All participants also discussed a variety of information sources that support innovative work behaviour development. Nine managers and non-managers explained that people (e.g. immediate colleagues and supervisors) are helpful in gathering information in support of the learning process because: (1) they are an interactive information sources where there is the possibility to question and gather additional information to create new ideas; (2) people can help to give a perspective on a situation that other information sources cannot (e.g. provide information on personal perspectives or lessons learned) and; (3) people can refer employees to other potential information sources if they are unable to help themselves (e.g. the intranet or websites). During a focus group, P42 explained that:

> "I was speaking to [other employee] and they were saying they send exam papers by encrypted e-mail. And so you're like "oh, I wonder how you do that?" so you just pick up the phone and you ask one of the guys on the Information Services Helpdesk and he'll tell you" (P42, NMD7F: 520-523)

Eleven participants (leaders, managers and non-managerial employees) indicated that people external to the organisation support the development of innovative work behaviour by facilitating the transfer of external information and knowledge into the organisation. For example, P6 (a leader), said:

> "We'll sometimes use consultants […]. For example, we realise that there's a need for more information on search engine optimisation and the team don't have that really detailed knowledge." (P6, LD6I: 403-405)

Information is also brought into the university from external websites (e.g. governing bodies, external databases). Employees use external information to gain a collective advantage over competitors. This is helpful when creating and implementing change (e.g. in processes and procedures), and this point was noted mainly by leaders, who are often involved in developing strategy for market competition.

Thus, on the theme of information literacy, it can be concluded form the analysis of interview and focus group data from the Scottish case study that:

- Information literacy is an initiator of innovative work behaviour to help set context to innovation and help employees to identify required information.
- A variety of information sources (e.g. internal people, external people, external websites and databases) help employees to seek and gather the information required to innovate.

5.3.2 Specific information behaviours that contribute to the development of innovative work behaviour

All participants in this case study discussed the contribution of information behaviours to the development of innovative work behaviour. Discussions centred on the importance of specific information behaviours during the initial stages of innovative work behaviour (i.e. idea creation and championing).

Information needs recognition helps the employees to decide which information behaviours are required to innovate. Participants viewed that the information behaviours can be for idea creation, or when employees are part way through the innovation process (e.g. in the championing or implementation stages). For example, during an interview, P4 said:

> "I suppose it's a sensible starting point to understand that you need to learn something which is the first bit, so you identify a gap and then find a means of filling it. Sometimes you end up the other way around of course. You can be doing a task and find something you didn't know you didn't know, then you go back and then you reflect on the processes to find the gap." (P4, LD7I: 457-462).

In the opinions of the participants, information seeking helps employees to create new ideas. This is because information is sought to apply to the idea, or to justify the creation of the idea itself. The justification of the idea then supports the implementation of the ideas if it has not been implemented previously. Participants explained that information seeking also helps to identify other parties who would be able to support the innovation if implemented (e.g. through funding). For example, P5 noted that:

"In our area if someone came up and said 'Why have we never done a gala dinner for our honorary graduates?' they would go and speak to somebody who would say 'No we've tried that in the past or we've done that or you know, why haven't we ever fundraised for this activity?'" (P5, LD31, 611-615).

Five participants who were interviewed for this case study also identified that information analysis is important for innovative work behaviour after information is gathered. Information analysis gives meaning to information in order to apply this to the creation of new ideas. Participants viewed information analysis as a skill that can be learned. For example:

"The first thing is you need to gather the information, make sense of the information and then learn how to use that information. It's only once you feel confident in the understanding of those facts that you can then begin to innovate on top of that." (P45, NMD7I: 269-273)

All participants of interviews and focus groups identified information sharing as a key information behaviour in innovative work behaviour development. Participants explained that information sharing helps employees to share new insight after they learn something new (e.g. from a training course) so that other employees can use this knowledge in adapting the way they work (e.g. carry out processes differently). For example, P4 (a leader who was interviewed) said:

"When people come back from courses and share that knowledge it triggers the thought process in colleagues. When you get colleagues who are doing similar tasks together and they have a conversation about, 'I want to do something in this way', it triggers that thought, 'I know you can do it that way'. This makes them think that 'oh maybe I should do something different'." (P4, LD7I: 74-483)

Participants also said that information and knowledge sharing helps to transfer external knowledge into the organisation. For example, employees share information from (external) people in the same roles who may have more suitable methods of carrying out tasks. P5, a leader of a service, exemplifies this point with knowledge sharing she had experienced across the education sector:

"So we're in an environment in which if somebody's doing something (e.g. telephone fundraising) then other people will share their scripts or the collateral and you can look at what other people are doing so we're very open to sharing across our industry." (P5, LD3I: 121-127)

The participants also discussed that information sharing can help innovative work behaviour for individual employees through the sharing of practice. In their opinions, the sharing helps employees to understand the work they do in different contexts and helps employees to adapt their practices in comparison with others. For example, P43 (a non-managerial employee) explained that:

"One of the main ways that they help me to learn and to probably influence my innovative behaviour in the workplace, would be sharing practices with those who do the same role at universities across the UK." (P43, NMD4I: 66-69)

Thus, on the theme of information behaviours, it can be concluded from the analysis of interview and focus group data from the Scottish case study that:

- Information behaviours contribute to the development of innovative work behaviour, specifically information seeking, information analysis and knowledge sharing.
- Information needs recognition helps employees to identify the needed information and the required behaviour.
- The analysis of information helps employees to add meaning to the information before this can be shared with others and applied to champion or implement new ideas.
- The sharing of information occurs on multiple levels. Employees share information between themselves and with others in external organisations in the hope of improving their own practice and the processes of the university.

5.3.3 The culture of the organisation

All of the participants of this case study explained that the organisational culture contributes to the development of innovative work behaviour. The views of the participants' highlighted that multiple elements of the organisational culture supports the creation of new ideas and the implementation of those ideas.

However, views from participants varied in relation to the influence of the collective and individual elements of the culture.

The (collective) culture helps to promote skill development of employees so that they use the continuous improvement approach adopted by the organisation. For example, P1, a leader, said:

> "If you want people to learn to grow as individuals, so they're changing, making continuous improvement and trying different things out in their areas, or in an individual level, then I think for me the culture's the key thing." (P1, LD5, 243-247)

All participants, regardless of whether they participated in an interview or focus group, felt that culture is also formed through the interactions that occur between individual employees (as opposed to the collective organisation). Therefore, the people who form the organisational culture can also influence innovative work behaviour development collectively. The participants believed that this is achieved through the behaviours and interactions they exhibit over time (e.g. through knowledge sharing or problem solving). P10, a manager, noted that:

> "I question the extent to which an organisation can actually change the culture. Culture is something that's very organic. It's something that people change themselves, rather than organisations. And so it's something that happens over time as a result of people responding positively to a particular direction that the university's taken." (P10, MD1F: 335-340).

Participants viewed that the organisations culture is important if employees learn something new and wish to implement this in the workplace. It helps to encourage employees to create new ideas and make attempts to implement the ideas (e.g. through the promotion of company values). The culture also helps employees to overcome challenges associated with idea implementation (e.g. the risk of failure).

> "I think the culture has to be there for it [innovation] to be successful because if you have learned something and you try and implement it, there's a lot of stumbling blocks […]. If you haven't been able to

implement any change or even suggest any change then it sort of defeats the point of learning something new." (P55, NMD9I: 376-379)

The participants also discussed a variety of characteristics that are important for organisational culture to promote innovative work behaviour. First, over half of the participants felt that the culture needs to be responsive to change to help employees to create new ideas when there is a need for change. In this instance, the culture helps to drive employee behaviour to create new ideas if the behaviours are in line with the values of the organisation (e.g. if the behaviours relate to innovation as presented in the organisational strategy). P3 explained that:

> "The culture needs to be responsive to change, adaptable to always be seeking improvements, so quite a strong sort of process improvement culture […] supported by the overarching values and behaviours. I would suggest we were exhibiting those and driving those forward before those overarching values and behaviours were brought into play." (P3, LD2I: 117-122)

The managerial staff in this case study identified that the promotion of culture depends on how the behaviour expectations are communicated to manage employee behaviour. The behaviours of employees can inhibit innovative work behaviour if not managed appropriately (e.g. through formal assessment processes). P13 explained that:

> "Something that we've never really managed as an organisation before is behaviour. We've really brought in the values and behaviours. What we're doing now is […] starting to align our objectives to the strategy, and then actually starting to measure how we've approached that against the values and behaviours." (P13, MD7F: 467-574)

The management of risks was also viewed as an important element of organisational culture that helps to promote innovative work behaviour. If potential risks are promoted, but managed effectively, this helps employees to innovate as they are encouraged to take risks. This includes giving employees permission to fail, with the expectation that there will be no negative consequences (e.g. punishment) if failure occurs (e.g. in risk taking). P8, a service leader who was interviewed, said:

> "You need to understand the risks and manage them, but I think sometimes you just have to try something. And then if it works, great, if it doesn't work, then let's change it and move on." (P8, LD8I: 209-211)

As well as risk taking, participants felt that the culture needs to consider employee responses to change. Some employees will respond well to proposed changes whereas others may be more resistant to implementing new ideas that inflict change. The culture serves to support those who resist change by allowing others to champion ideas and explain the benefits of the changes taking place. For example, P21 argued that:

> "A lot of people don't like change. Other people are very good and very accepting of it. If it is something they agree with and believe in they are very good at being advocates for what we are doing and championing it." (P21, MD81: 317-323)

Thus, on the theme of organisational culture, it can be concluded from the analysis of interview and focus group data from the Scottish case study that:

- Organisational culture occurs on the collective level (e.g. through the strategy and values set) as well as on the individual level (e.g. through the promotion of innovative work behaviours form other employees).
- There are three main elements of culture that are important to consider. First, the culture should promote innovation to encourage employees to create new ideas.
- Next, risk taking must be assessed and measured, and ensure that failure is welcomed to encourage employees to take risks needed to innovate.
- Finally, the culture must account for the different coping mechanisms employees have in place to cope with change, and the differences in views from employees who may or may not welcome change.

5.3.4 Leadership and leaders within organisations

Leadership within the organisation was highlighted by interviewees and focus group participants to contribute to innovative work behaviour development. Most participants viewed leadership (collectively) as a driver for innovation. This is because the leadership team works together to promote innovation from employees in the workplace. For example, P13 explained that:

"Within the past couple of years, a new service has been created […]. The drive behind that service is innovation, resilience, all of that […] the drive not just from the director but from the whole of the management team, in actually creating different ways of working, innovation and recognising that." (P13, MD7F: 12-19).

The discussion of participants centred on the role of leaders within the leadership of the university. Leaders support innovative work behaviour development by: (1) supporting employees to cope with change and failure in the process of innovation; (2) facilitating communication to encourage knowledge sharing through the provision of suitable infrastructure and; (3) providing resources for innovation (e.g. suitable space in the office).

Ten of the fifty-nine the participants in this research also felt that leaders play a key role in supporting employees when innovation fails. For example, the participants (mostly managers and non-managerial employees, with the exception of one leader) said that leaders provide emotional and practical support to help employees reflect and review the process of innovation. Additionally, leaders reassure employees that they will not be blamed if failure occurs. For example, P5, a leader of a service, explained that:

"It's about how do we support people to be innovative, but also support them when they don't get things quite right. You know there is a bit of a fear around the organisation I think about 'oh you know what would happen if you...'" (P5, LD3I: 453-457)

Over thirty of the fifty-nine participants explained that leaders also facilitate communication, knowledge sharing and reflection between employees. This is vital in innovative work behaviour development. Participants explained that it is achieved though the communication between leaders and employees (e.g. promotion of organisational values and expected behaviours), or through the management of the physical environment (e.g. office setup) to encourage information and knowledge sharing form employees. P8 noted that:

"Asking people about what went well, what lessons did they learn, and so on, kind of helps with learning. I suppose it's also something I do myself, because I'm naturally quite a reflective person. So I'm learning, and know what I'm expecting of from other people." (P8, LD5I: 41-43)

142

It is noted that thirty of the non-managerial participants in this research emphasised the impact of leaders' decisions of employee innovative work behaviour. Participants explained that leaders can make decisions with the best intentions (e.g. rearrange an office space). However, this can hinder innovation from employees. For example, the decision to restructure an office seating arrangement can hinder information sharing processes important for innovation. For example, during an interview, P23 said:

> "You have caught me at a bad moment. I have only just come into it today. I could have cried […]. I will work at home. I will work on other campuses […]. I think the physical space in which one works and lives makes an enormous difference to one's spirit and soul, to one's concentration, to how one feels colonised by a system. One loses one's individuality, one loses one's sense of identity, one loses one's sense of meaning in one's workplace." (P23, MD6I: 329-385)

The opinions of P23 referred to a large organisational change which was ongoing at the time of data collection (the day before her interview took place). Many of the offices were being restructured to large open plan offices (as opposed to smaller individual offices). The impact of this change, according to participants, is that employees are less productive, and make decisions to work elsewhere. In turn, this makes communication with other employees difficult and acts to unintentionally hinder innovative work behaviour.

At the same time, seven other participants (who were not leaders) felt the need for further leadership support regarding wider organisational innovation. They highlighted that big changes within organisations require sponsorship and championing from the leadership team. It is important that key messages are communicated to employees form leadership the leadership team to demonstrate the commitment the organismal has to changes made. Communication from the leadership team also helps employees to understand reasons for changes, question changes and understand the impact the changes have. P38 explained that:

> "We are missing a stronger sponsorship at senior level, to support those changes going through […]. Some of them [the changes] have been pretty significant. The visibility and the voice of the senior team is

sometimes missing in these big change projects, and the expectations are high that people will just change, without fully understanding what any impact might be, on individuals, on teams, on the wider organisation." (P38, NMD1F: 243-251)

Thus, on the theme of leaders and leadership within organisations, it can be concluded from the analysis of interview and focus group data from the Scottish case study that:

- The wider leadership team are important for innovative work behaviour development to help to communicate and promote changes that are taking place in the workplace.

- This wider leadership helps employees to understand the required changes, but acts as a hindrance of innovative work behaviour if not done. Leaders in the leadership teams help employees to develop innovative work behaviour by: (1) supporting employees to cope with change and failure in the process of innovation and; (2) the facilitation of communication to encourage knowledge sharing through the provision of suitable infrastructure.

- However, as noted by participants in this research, some decisions made by leadership can hinder innovative work behaviour processes if not considered from all employee perspectives (e.g. the creation of open plan offices).

5.3.5 Individual skills and abilities of employees

The skills and abilities of employees were highlighted by participants as contributing factors to the development of innovative work behaviour. Participants indicated that reflection is a key skill to support innovative work behaviour development. This is because reflection helps to promote the creation of new ideas if the need to do so is identified as part of the reflection process. The participants viewed reflection as a driver for change because the process of reviewing processes and procedures helps to identify where change is needed (and where it is not). P4, a leader who was interviewed, said:

"Reflection is absolutely key […]. So I think to myself, what is it we're trying to achieve? Where is it we're trying to get to. And that's reflective." (P4, LD7: 218-226)

Three participants also felt that reflection occurs from individual employees (as exemplified by P4 above) but the process also occurs as part of teams. Team reflection helps employee to think about their learning (e.g. from training). The sharing of knowledge learned is a key activity in innovative work behaviour development as other employees can use the new information in the creation of new ideas. For example, P7 (a leader) explained that:

> "My team are quite reflective […]. So it would not be unusual for someone to say in this department 'I was away for a week, it was very mixed. But actually on reflection, I think the thing I've learned the most is *x*. And here's why'." (P7, LD4I: 356-362).

Two of the three participants noted above said the time taken to reflect on processes is a barrier to innovative work behaviour. In their opinions, this is because employees (especially those in university settings) do not often have enough time away from tasks to reflect. As a consequence, some employees do not reflect on actions and therefore do not use learnings in innovative work behaviour.

Additionally, three participants felt that reflection is impacted by the enthusiasm, personal drive and motivation from employees. They explained that some employees are comfortable in reflecting whereas others are not and require support to do so. This support can be from enthusiastic colleagues who are more comfortable in reflecting on actions (e.g. a manager). P25, a manager who was interviewed, said:

> "I like to talk and reflect. I think some people are maybe less comfortable […]. We work doing something that is really easy to be passionate about, I've got a team of highly motivated, very passionate individuals […]. So it makes it quite easy to push for innovation, because they're always looking for ways of making things better or different or reach new groups, or engaging a little bit more, or dial this bit up." (P25, MD5I: 150-159)

Problem solving was identified by participants as a key skill in innovative work behaviour development. This is relevant to making smaller macro changes in the organisation as opposed to larger organisational changes. Problem solving skills help employees to identify where the creation of new idea is needed and how the changes could be implemented.

"I think one of the biggest ones is being able to problem solve. Innovation doesn't have to astronomical, you look at the marginal gain stuff in the Olympics, it was probably inspirational and they managed to do a huge amount. But the technological advances they made were through tiny, tiny changes. So there's innovation with that, somebody thought I'll just suddenly tweak that, that was an innovative thought." (P1, LD1I: 500-505)

Thus, on the theme of individual skills and abilities of employees, it can be concluded form the analysis of interview and focus group data from the Scottish case study that:

- Reflection is a key skill in innovative behaviour development. This is because reflection helps employees to identify where changes are needed and take action on the learning of previous similar tasks.
- Some employees need support to reflect and this can be offered by immediate colleagues and leadership (who are highly enthusiastic about the reflection process).
- Finally, participants identified problem solving as another key skill in innovative work behaviour development. This is because problem solving helps employees to identify where new ideas are needed and how this could be done.

5.4 Findings from the quantitative questionnaire data analysis

The results of the questionnaire are presented in this section. Participants were asked to identify: (1) from a series of factors, how important they feel the factors are in being able to innovate at work; (2) the frequency in which they had participated in certain activities over the past year and; (3) demographic information and information on employment characteristics.

5.4.1 Results of the statistical analysis

During this process of data cleansing, all variables were given a name (e.g. the factor that may influence innovation or a particular innovation activity) and these were coded accordingly. Each variable (or question response set) was then assigned to one of two categories: (1) the independent variables: factors

participants feel influence innovation or; (2) the dependent variables: the activities the participants take part in (see Chapter 4 for a full description of the questionnaire questions). Once the coding process was complete, the set of independent variables and dependent variables were deemed suitable for use in the next part of the analysis (see Table 20 below for a list of the independent and dependent variables).

Table 20: Independent and dependent variables identified from questionnaire questions

Independent variables identified from questionnaire questions (factors important in innovative work behaviour)
Designated time for learning and development activities (e.g. for training)
Funding for new initiatives, learning and development
Opportunities to collaborate with others (e.g. in mentoring relationships)
Access to appropriate tools and technology (e.g. computer facilities, new software)
Access to physical space for independent work
Access to a physical space for collaborative work (e.g. comfortable space away from desk, staff common room)
Open plan office environments
Institutional direction (e.g. organisational strategy that promotes innovation)
Supportive leadership (e.g. approachable and supportive managers)
Availability of training opportunities
Your actual participation in training opportunities (e.g. whether you participate in training opportunities)
Ease of participation in training opportunities (e.g. training activities scheduled at a suitable time for me)
Personal belief in the goals and strategy of the organisation
Personal enthusiasm
Quality of communication between colleagues
Time to reflect
Internal knowledge sharing (i.e. between colleagues)
External knowledge sharing (e.g. with peers at conferences)
Knowledge transfer from external environment into internal environment (e.g. news from conferences)
Your ability to cope and deal with change
Permission to take risks
Your skills in searching for information (e.g. knowing where to look)
Your skills in retrieving information (e.g. knowing how to access relevant material)
Your skills in analysing information
Your skills in interpreting information (e.g. statistics)

Independent variables identified from questionnaire questions (factors important in innovative work behaviour)
Your skills in sharing information (e.g. knowing techniques for passing information onto others)
Your skills in presenting information
Access to a navigable corporate information/knowledge base
Dependent variables identified from questionnaire questions (participation in learning and innovation activities)
Acquiring new information (e.g. by searching the internet or organisational knowledge base)
Working alone or with others to develop solutions to problems
Working alone to develop new ideas
Working with others to develop new ideas
Following new developments in your field
Performing new tasks
Asking colleagues for advice
Using self-study materials
Observing or replicating colleagues' strategies to complete a task or solve a problem
Finding a better way to do a task by trial and error
Reflecting on previous actions
Receiving feedback on tasks from work colleagues
Does your organisation provide training for employees?

There were twenty-eight independent variables and twelve dependent variables identified from the questionnaire questions. The decision was therefore taken to reduce the number of independent variables and carry out a factor analysis with varimax rotation. The factor analysis was then followed by a binary logistic regression to explore whether the resulting factors predicted the participation in learning and innovation activities. Each of the two statistical procedures are explained in further detail in the sections that follow.

5.4.1.1 Reduction of independent variables to fewer factors

Stage one of the statistical analysis involved carrying out an exploratory factor analysis (Field, 2009, p.628). The purpose of the factor analysis was to take a large amount of information and reduce this information down to a more manageable amount. For example, the purpose of this *specific* factor analysis was to reduce the twenty-eight independent variables (i.e. the factors which

participants felt influences innovation) into fewer variables. The new variables (the results of the factor analysis) are known as factors as they account for how much the original independent variable explain the new factors (i.e. the amount of variance).

All 28 independent variables were entered into the factor analysis procedure carried out in SPSS. However, the decision was then taken to remove variables which were largely independent of other variables, as indicated by analysis of the correlation and covariance structures. The results are explained below.

As part of the factor analysis, a Kaiser-Meyer-Olkin (KMO) sampling adequacy test was carried out. This test indicated the proportion of variance within the variables that may be associated with underlying factors. This resulted in a KMO value of .818 which enabled the conclusion that the variables were likely to factor well together. At the same time, a Bartlett's Test of Sphericity test was carried out. This statistic tests the relationships (e.g. correlations) between the variables as the variables must be related to be able to carry on with the factor analysis (i.e. there would be no reason to carry out a factor analysis if all of the variables were independent of each other and not related). The Bartlett's Test of Sphericity was significant at, $p < .001$. This indicated that the correlations in the analyses were not too small and relationships between the independent variable were detected.

As part of the analysis small non-significant contributions were supressed in the presentation of scores to indicate only major significant contributions (of the variables) to the factors (scores of less than 0.3 were supressed). The test resulted in the creation of six new factors. The contribution of each independent variable to the new factors are detailed in Table 21. The factors together explained 68.79% of the variance.

Table 21: The contribution of the independent variables to the six new factors, taken from SPSS output for the Scottish case study

Variables entered into the factor analysis	Components (factors)					
	Skills in information	Training and learning	Access to resources	Personal drive and leadership	Organisational strategy and goals	Knowledge sharing
Your skills in analysing information	0.877					
Your skills in interpreting information (e.g. statistics)	0.861					
Your skills in retrieving information (e.g. knowing how to access relevant material)	0.846					
Your skills in searching for information (e.g. knowing where to look)	0.800					
Your skills in sharing information (e.g. knowing techniques for passing information onto others)	0.721					
Your skills in presenting information	0.717					
Availability of training opportunities		0.833				
Your actual participation in training opportunities (e.g. whether you participate in training opportunities)		0.803				
Designated time for learning and development activities (e.g. for training)		0.750				
Ease of participation in training opportunities (e.g. training activities scheduled at a suitable time for me)		0.710				
Access to a physical space for collaborative work (e.g. comfortable space away from desk,			0.859			
Access to physical space for independent work			0.769			
Opportunities to collaborate with others (e.g. in mentoring relationships)			0.627		0.424	
Access to appropriate tools and technology (e.g. computer facilities, new software)		0.399	0.520			
Personal enthusiasm				0.828		
Your ability to cope and deal with change	0.394			0.505		
Quality of communication between colleagues	0.350			0.472	0.430	
Institutional direction (e.g. organisational strategy that promotes innovation)					0.811	
Personal belief in the goals and strategy of the organisation				0.462	0.675	
External knowledge sharing (e.g. with peers at conferences)						0.865
Knowledge transfer from external environment into internal environment (e.g. news from conferences)						0.768
Internal knowledge sharing (i.e. between colleagues)		0.325	0.417			0.440
TOTAL VARIANCE EXPLAINED BY FACTOR	**29.69%**	**10.90%**	**10.28%**	**7.64%**	**5.79%**	**4.48%**

*Individual variables are highlighted to indicate inclusion in each component (factor). The variables highlighted in the variable name column indicates no contribution of this variable to any component (factor).

Details of the contribution of the independent variables to the six new factors are presented in Table 21. To name each of the new factors, consideration was as to the independent variables that contributed to explaining each factor (see Table 21 above).

Many of the contributions to Factor 1 were skill related in terms of the skills used for information behaviour. Therefore, the name of factor 1 (Individual skills relevant to information behaviours) reflects this. The contributions to Factor 2 surround training and training activities. Therefore, the name given to this, Training and learning, reflects the activities involved related to training. For Factor 3, access to resources was a key theme, including access to a physical space. This is acknowledged in the name. Factor 4 includes variables relating to personal enthusiasm and drive as well as leadership. The organisational goals and strategy are highlighted in Factor 5. This takes into account the personal belief in the strategy and goal as well as direction from the organisation. Knowledge sharing was an element highlighted in Factor 6. This includes knowledge sharing on the collective level (e.g. between people at conferences) but also individual knowledge sharing of immediate colleagues.

5.4.1.2 Regression to explore predictors of learning and innovation activities

A Binary Logistic regression was carried out to explore whether the factors created in the above factor analysis predicted the dependent variables (i.e. participation in learning and innovation activities (Field, 2009, p.265). The analysis was used to calculate the likelihood (or odds) that the independent variables would predict the dependent (outcome) variables.

The outcome variables (i.e. the dependent variables) were the innovation and learning activities that questionnaire respondents indicated that they either took part in or did not. The decision was taken to use a binary logistic regression as the dependent variables were categorical (i.e. participant responses were categorised and coded as either 'took part in the activity' or 'did not take part in the activity' and these were coded accordingly). Therefore, the analysis can be applied to predict the likelihood as to whether participants would participate in certain activities or not.

All predictor variables were entered into the binomial logistic regression model in SPSS separately for each outcome variable to explore the influence of predictor variables individually. In addition, during each analysis, gender, age group, length of service and employment rank were included into the analysis as mediating variables (i.e. predictor variables that could influence the outcome variables, but which are not of direct interest to the study).

The results of each Binary Logistic Regression are summarised in Table 22 below.

Table 22: Results of the Binary Logistic Regression (adapted from SPSS output)

						95% C.I.for Odds Ratio	
Dependent Variable	**Independent Variables**	**Coefficient**	**S.E.**	**P value**	**Odds Ratio**	**Lower**	**Upper**
Working alone to develp new ideas	F4 Personal drive and leadership	0.438	0.265	0.098	1.55	0.923	2.605
	Females	0.97	0.5	0.052	2.638	0.991	7.023
	Leader or manager	1.041	0.513	0.043	2.831	1.035	7.745
	Constant	-1.227	0.372	0.001	0.293		
Working alone or with others to develop new ideas	F4 Personal drive and leadership	0.874	0.393	0.026	2.396	1.11	5.172
	F5 Organisational goals and strategy	0.81	0.366	0.027	2.248	1.098	4.605
	Age 16-34	0.494	1.095	0.652	1.639	0.192	14.017
	Age 35-44	2.701	0.992	0.006	14.893	2.13	104.134
	Age 45-54	1.527	0.978	0.118	4.606	0.678	31.311
	Leader or manager	1.814	0.66	0.006	6.135	1.683	22.363
	Constant	-2.904	0.893	0.001	0.055		
Finding a better way to do a task by trial and error	F2 Training and learning	1.041	0.43	0.015	2.833	1.22	6.577
	Constant	-1.385	0.327	0	0.25		
Perform new tasks	F3 Access to resources including space	0.741	0.397	0.062	2.099	0.963	4.574
	F4 Personal drive and leadership	0.689	0.342	0.044	1.991	1.018	3.894
	F5 Organisational goals and strategy	0.716	0.327	0.029	2.046	1.077	3.886
	Constant	-0.903	0.304	0.003	0.405		
Working alone or with others to find solutions to problems	F3 Access to resources including space	0.502	0.301	0.095	1.653	0.916	2.981
	F4 Personal drive and leadership	0.72	0.295	0.015	2.054	1.153	3.659
	F6 Knowledge sharing	0.982	0.39	0.012	2.671	1.245	5.732
	Leader or manager	1.72	0.754	0.022	5.587	1.276	24.466
	Constant	0.491	0.336	0.144	1.634		
Receiving feedback from work colleagues	F2 Training and learning	-0.712	0.353	0.044	0.491	0.245	0.981
	F5 Organisational goals and strategy	1.222	0.502	0.015	3.395	1.27	9.074
	Constant	-2.069	0.416	0	0.126		
Asking colleagues for advice	F1 Skills	-0.768	0.362	0.034	0.464	0.228	0.943
	Employed 1-6 years	1.765	0.799	0.027	5.841	1.22	27.964
	Employes 7-10 years	2.838	1.184	0.017	17.075	1.678	173.73
	Employed 10+ years	1.308	0.668	0.05	3.698	0.998	13.701
	Constant	-0.68	0.518	0.19	0.507		
Observing or replicating others' strategies to complete a task or solve a problem	F2 Training and learning	1.201	0.54	0.026	3.322	1.152	9.575
	Constant	-2.136	0.402	0	0.118		

Results of the binary logistic regressions indicated that there were no significant predictors of: (1) acquiring new information; (2) following developments in your field; (3) reflecting on actions and; (4) using self-study materials. Therefore, these findings are not presented in Table 22 above.

Binary logistic regression results indicated that *personal drive and leadership* was a significant predictor of whether participants work alone to develop new ideas or not [Chi-Square=11.628, df=3, p=.009]. *Skills, training and learning,*

access to resources, organisational goals and strategy and *knowledge sharing* were not significant predictors. The model correctly predicted 70.6% of cases where they either worked alone to develop new ideas or did not participate in that activity. The odds ratio indicated that if participants were exposed to personal drive and leadership they were 1.5 times more likely to work alone to develop new ideas.

Personal drive and leadership, and organisational goals and strategy were significant predictors of whether participants work with others to develop new ideas or not [Chi-Square=35.739, df=6, p<.005]. *Skills, training and learning, access to resources* and *knowledge sharing* were not significant predictors. The model correctly predicted 85.5% of cases where they either worked with others to develop new ideas or did not participate in that activity. The inclusion of personal drive and leadership indicates that participants were twice as likely to work with others to develop new ideas when exposed to this. The same result is seen for organisational goals and strategy. Those aged 16-34 were just over 1.5 times more likely to work with others to develop new ideas. Those who were aged 35-44 were 15 times more likely to do so and those who were aged 45-54 were nearly 5 times more likely to do so. Leaders and managers were also 6 times more likely to work with others to develop new ideas compared to non-managerial employees.

T*raining and learning* was a significant predictor of whether participants found a better way to do a task by trial and error [Chi-Square=8.060, df=1, p=.005]. *Skills, access to resources, personal drive and leadership, and organisational goals and strategy* and *knowledge sharing* were not significant predictors. The model correctly predicted 79.7% of cases where they either found a better way of doing a task by trial and error or did not participate in that activity. The odds ratio indicated that participants who were exposed to training and learning in the workplace were nearly three times as likely to find a better way of doing a task by trial and error.

Access to resources including space, personal drive and leadership and organisational goals and strategy were all predictors of whether participants perform new tasks [Chi-Square=12.521, df=3, p=.006]. *Skills, access to resources, personal drive and leadership, and organisational goals and strategy* and *knowledge sharing* were not significant predictors. The model correctly

predicted 72.7% of cases where they either found a better way of doing a task by trial and error or did not participate in that activity. The odds ratio indicated that if participants have access to resources including space, they were over twice as likely to perform new tasks. At the same time, participants were nearly twice as likely to preform new tasks if they have personal drive and leadership, and over twice as likely to perform new tasks if exposed to the organisational goals and strategy of the organisation.

Access to resources including space, personal drive and leadership and *knowledge sharing* were all predictors of whether participants work alone or with others to find solutions to problems [Chi-Square=25.54, df=4, p<.005]. *Skills, training and learning,* and *organisational goals and strategy* were not significant predictors. The model correctly predicted 76.6% of cases where they worked alone or with others to find solutions to problems or did not participate in that activity. Participants were over 1.5 times more likely to work alone or with others to find solutions to problems if they had access to resources including space, over twice as likely to do so if they had personal drive and leadership available and are over 2.5 time more likely to work with alone or with others to find solutions to problems if there was knowledge sharing. Leaders and managers were also over 5 times more likely to work alone or with others to find solutions to problems.

Training and learning and organisational goals and *strategy* were predictors of whether participants receive feedback on tasks from work colleagues [Chi-Square=11.216, df=2, p=.004]. *Skills, access to resources including space, personal drive and leadership* and *knowledge sharing* were not significant predictors. The model correctly predicted 83.3% of cases where the participants received feedback on tasks from work colleagues or did not. Participants were less likely (by half) to receive feedback on tasks from work colleagues if they were exposed to training and learning. However, participants were over three times as likely to receive feedback on tasks from work colleagues if they were exposed to the organisational goals and strategy of the organisation.

Skills was a predictor of whether participants ask colleagues for advice [Chi-Square=18.429, df=4, p=.001]. *Training and learning, access to resources including space, personal drive and leadership, organisational goals and strategy* and *knowledge sharing* were not significant predictors. The model

correctly predicted 83.6% of cases where they asked colleagues for advice or did not participate in that activity. Participants were less likely (by half) to ask colleagues for advice if they had skills relevant to information behaviour (e.g. information searching, analysis and the sharing of information). Those who were employed between 1-6 years were nearly 6 times more likely to ask colleagues for advice. Those employed between 7-10 years were nearly 18 times more likely to do so and those employed for the organisational for 10+ years were over 3 times more likely to do so.

Training and learning was a predictor of whether participants observe or replicate others' strategies to complete a task or solve a problem [Chi-Square=6.874, df=1, p=.009] (see Table 15). *Skills, access to resources including space, personal drive and leadership, organisational goals and strategy* and *knowledge sharing* were not significant predictors. The model correctly predicted 87.2% of cases where they observed or replicated others' strategies to complete a task or solve a problem or did not participate in that activity. The odds ratio indicated that participants were over three times more likely to observe and replicate others' strategies to complete a task or solve a problem if they were exposed to training and learning in the workplace.

A summary of the contribution of the six factors to the participation in the learning and innovation activities is presented in Table 23 below.

Table 23: Factors which predict participation in learning and innovation activities

Factors	Learning and Innovation Activities							
	Working alone to develop new ideas	Working with others to develop new ideas	Finding better way to do a task by trial and error	Performing new tasks	Working alone or with others to develop solutions to problems	Receiving feedback on tasks from work colleagues	Asking colleagues for advice	Observing or replicating colleagues' strategies to complete a task or solve a problem
Skills							X	
Training and learning			X			X		X
Access to resources				X	X			
Personal drive and leadership	X	X		X	X			
Organisational goals and strategy		X		X		X		
Knowledge sharing					X			

The binary logistic regression analysis revealed that several factors contribute to eight of twelve learning and innovation activities in the workplace (see Table 23). Personal drive and leadership predicted participation in most activities. These related to developing new ideas, developing solutions and performing new tasks (all relevant to innovative work behaviour). Both training and learning, as well as organisational goals and strategy, predicted three activities. Training and learning predicted participation in tasks that are exploratory in nature (i.e. using trial and error, observing or replicating colleagues' strategies to complete a task or solve a problem and also receiving feedback from colleagues). Skills and knowledge sharing only predicted one activity each. Knowledge sharing is important for innovative work behaviour and is a predictor of the task of working alone or with others to develop solutions to problems. At the same time, asking colleagues for advice may require a certain skill set. This is evidenced with skills as a predictor of this activity. Finally, access to resources including space, predicted the activities of performing new tasks and working alone or with others to develop solutions to problems. The nature of these activities means that resources may be vital in order to work with others and create new ideas, and perform new tasks in the process of innovating.

5.4.1.3 Reliability testing of the factor analysis output

The results of the factor analysis demonstrated that there are six factors that contribute to the development of innovative work behaviour activities. Following this analysis, and to allow for comparison with data from the Finnish and English case studies, further analyses were undertaken to determine the reliability of the factors created from the reduction of the original variables.

The procedure of the final phase of data analysis comprised: (1) an assessment of the groupings of the variables that were used to create the above factors; (2) the creation of a new set of independent variables to encapsulate the relationships in the data and; (3) multiple t-tests to explore the importance of the factors in the development of innovative work behaviour.

For each set of variables (i.e. those that make up the six factors from the Scottish Case study), Cronbach's alpha test was carried out (Field, 2009). Cronbach's alpha is a test of reliability and consistency of a set of variables that are suggested to measure the same concept. The purpose of this test was to

measure the internal consistency of the variables (i.e. how closely related they are).

The results of the reliability testing were then used to create a new overall variable to reflect each factor of the Scottish Case study factor analysis. Once created, one sample t-tests were carried to explore whether the responses from participants differed from the neutral option in the questionnaire responses. The t-test analyses used the value of 4 as the comparison value as participants were asked to indicate this value if they felt the importance of the factor to the development of innovative work behaviour was neutral (i.e. neither high or low importance).

5.4.1.4 Results of reliability testing

The results of the Cronbach's alpha test for all factors is presented in Table 24 below.

Table 24: Cronbach's alpha statistics for all six factors

Factors	Cronbach's alpha (α)
Skills	.909
Knowledge sharing	.731
Training and learning	.852
Access to resources	.723
Personal drive and leadership	.734
Organisational goals and strategy	.721

For all factors Cronbach's alpha revealed high internal consistency as all statistics are above 0.7 (see Table 24). This means that all variables used to explain factors are adequate.

A one samples t-test revealed that there was a significant difference between the ratings of individual skills relevant to information behaviour as important to the development of innovative work behaviour and that of the neutral score of 4, $t(134)=25.378$, $p<.001$). Participants rated individual skills relevant to information behaviour as more important to the development of innovative work behaviour than the neutral score (mean = 5.7).

This was also the case for knowledge sharing, t(124)=25.940, p<.001. Participants rated knowledge sharing as more important to the development of innovative work behaviour than the neutral score (mean = 5.8).

There was a significant difference between the ratings of training and learning as important to the development of innovative work behaviour and that of the neutral score of 4, t(135)=25.152, p<.001. Participants rated training and learning as more important to the development of innovative work behaviour than the neutral score (mean = 5.8).

The same results were found for access to resources, t(135)=19.318, p<.001. Participants rated access to resources as more important to the development of innovative work behaviour than the neutral score (mean = 5.4).

There was also a significant difference between the ratings of personal drive and leadership as important to the development of innovative work behaviour and that of the neutral score of 4, t(135)=42.238, p<.001. Participants rated personal drive and leadership as more important to the development of innovative work behaviour than the neutral score (mean = 6.1).

This was also the case for organisational goals and strategy as important to the development of innovative work behaviour and that of the neutral score of 4, t(135)=26.006, p<.001. Participants rated organisational goals and strategy as more important to the development of innovative work behaviour than the neutral score (mean = 5.8).

5.5 Chapter conclusion

The findings presented in this chapter have provided evidence as to the contribution of Information literacy, information behaviours, organisational culture (including the organisational strategy), leadership, individual skills and abilities, training to the development of innovative work behaviour through workplace learning. Evidence is also presented from the analysis of interviews, focus group discussions and a quantitative questionnaire as to the interrelations between themes and the contribution of multiple themes to the four main innovative work behaviour processes (recognition of innovation need, creation of ideas, championing of ideas and implementation of ideas). The contribution of each theme to the innovative work behaviour processes are shown in Table 25 below.

Table 25: Contribution of each theme to each innovative work behaviour process (findings from qualitative and quantitative data analysis combined)

Innovative work behaviour processes (West & Farr, 1990)	Contributing factors to innovation (findings from interviews, focus groups and questionnaire)								
	Information literacy	Information need recognition	Information seeking	Information analysis	Information and knowledge sharing	Culture (including the organisational strategy)	Leadership	Training and learning	Individual skills and abilities
Recognise the need to innovate		X		X	X	X	X		X
Create idea	X		X		X	X	X	X	
Champion idea	X	X			X	X	X	X	X
Implement idea					X	X	X		

A summary of the contribution of each theme to the development of each innovative work behaviour process (West & Farr, 1990) is presented in Table 25. From the analysis of qualitative and quantitative data, the key contributing factors to all four processes are information and knowledge sharing, culture and leadership. There were also individual themes that emerged from the analysis of qualitative and quantitative data as enhancers and inhibitors of innovative work behaviour.

Information literacy contributes to the creation and championing of ideas and helps employees to decide the behaviours to exhibit with information. Information needs recognition contributes to the recognition of the need for innovation and also to the championing of ideas to leadership (i.e. to give evidence as to why an idea is needed). Information literacy

From the analysis of interview, focus group and questionnaire data, the most common information behaviour discussed by the participants was information and knowledge sharing. This helps employees at all stages of innovative work behaviour, specific to exchange ideas and opinion during the innovation process. Other information behaviours were also noted during discussions. Participants explained that information analysis only contributes to the recognition of the need to innovative. However, participants did explain that information analysis is related to the learning that underpins innovative work behaviour (i.e. the meaning of the information is needed before the information is used in innovative work behaviour). Information seeking benefitted employees during the idea creation stage if employees could find the required information easily. In line with the discussions from participants, the analysis of the quantitative questionnaire revealed that information skills and abilities of employees are useful in asking colleagues for advice. Asking for advice is a behaviour which is useful when creating and championing ideas in the workplace.

Three main contextual factors emerged from the analysis of interviews, focus group discussion and the quantitative questionnaire questions. These were: (1) Culture (including the strategy of the organisation); (2) leaders and leadership within the organisation and; (3) training. From the analysis of the qualitative

data, culture is vital at all stages of innovative work behaviour to help employees understand expected innovation related behaviours, have support for innovations (provided by colleagues and leaders). This was reflected in the quantitative questionnaire findings which revealed that culture and the organisational strategy help employees to work with others to develop new ideas and perform new tasks.

Findings form the analysis of the interview, focus group data showed that leaders promote culture and help to provide vital support for innovative work behaviour (e.g. resource, emotional and practice support). In line with this, the quantitative questionnaire findings suggested that leadership helps employees to work together and perform new tasks which are also important for innovation. However, if leaders do not communicate the culture and strategy effect, this hinders innovative work behaviour development.

Two main categories were not discussed by interview and focus group participants. These were training and access to resources. In the analysis of the quantitative questionnaire, these two factors emerged as important for innovation (i.e. finding new ways to carry out tasks and also to perform new tasks). However, it was noted by some interview participants that leaders provide more practical support (e.g. training and resources) and this emphasises the importance of training and resources in innovative work behaviour development.

As noted in the analysis of interview and focus group discussions, the individual skills and abilities of employees contributes to the recognition of the need for innovation and also the championing of ideas. This is with reference to the reflection processes involved in the learning process before innovative work behaviour and the need to reflect on the innovation process before presenting ideas in the championing phase. Participants explained that time needed to reflect acted as a barrier, as time was restricted in their work.

The findings presented in this chapter also highlight the complexity of the views between different employment ranks of the university. For example, leadership and managerial employees viewed the values within the organisational strategy as key for innovative work behaviour development from employees and that the values are promoted throughout the university to all levels of staff. However,

non-managerial employees did not see that this is the case and evidence is presented as to the lack presence of leadership within innovations of the university (as viewed by the non-managerial employees of this case study).

It is evident from the interview and focus group data presented here that the central focus of innovation within the university relevant to the processes and procedures. This is highlighted within the multiple examples that participants gave in how they make attempts to improve the processes and procedures of the departments they are in. The overarching organisational innovation (i.e. improvements to the business structures and practices) is at the heart of idea creation of this university, yet the lower level innovative focus of behaviour of employees remains that of the internal processes and procedures. The discussion of the initial stages of innovative work behaviour from participants (i.e. creation and championing of ideas) provides evidence to suggest that the university may have some resources and knowledge relevant to the initiation of innovation. However, the lack of focus on fully implemented innovations from participants of this research suggests that the university is yet to reach higher levels lower levels of innovation maturity.

From the findings of the interviews and focus group discussions with participants it is also evident that innovation practices within departments may differ to other departments, and this adds emphasis to the importance of context in the development of innovative work behaviour for employees. However, to fully understand the contextual differences in the development of innovative work behaviour other workplace contexts must be explored. Therefore, presented in the next chapter are the findings from a case study where data collection was carried out in Finland.

Chapter 6: Findings from Finnish case study

6.1 Introduction

In this chapter the findings are presented from the analysis of data collected from interviews with non-academic employees, and the quantitative questionnaire deployed in a Finnish University. As with the Scottish case study (as reported in Chapter 5), the same study aims and approach were used to furnish knowledge on the development of innovative work behaviour. However, here this is achieved through the lens of a different organisational context (i.e. a university in Finland as opposed to Scotland).

The sample comprised twelve interview participants. No focus groups were carried out as part of the Finnish case study. Eighteen participants completed the questionnaire either in part or full. As with the other case studies in this thesis, the interviews were semi-structured in design and underpinned by Bandura's Social Cognitive Theory (see Chapter 3). Similarly, the design of the quantitative questionnaire was informed by the literature that underpins this thesis (see Chapter 2) and a validated scale of workplace learning.

The chapter begins with additional information on the context to the Finnish case study (section 6.2) and is followed by a discussion of the main themes that emerged. The themes that emerged were similar to the themes that emerged for the analysis of the Scottish case study data. The themes reported here are:

1. The role of information literacy in the development of innovative work behaviour (section 6.3.1);
2. Specific information behaviours that support innovative work behaviour development (section 6.3.2);
3. The culture of the organisation (section 6.3.3);
4. Leadership and leaders within the organisation (section 6.3.4);
5. Skills and abilities of employees (section 6.3.5).

The findings from the quantitative questionnaire are then presented in the final section (section 6.4) followed by a conclusion to the chapter (section 6.5).

6.2 Context to the case study setting

In this section additional information on the context to the Finnish University case study is provided. This includes details on the strategic direction of the university and changes to the university taking place at the time of data collection. Information on participant characteristics is also provided to highlight the sample representation in relation to the university structure.

6.2.1 Context to the Finnish University

This case study organisation is a publicly funded university in Finland. At the time of data collection, the university employed approximately 1200 personnel (e.g. those in professional services as well as academic staff) and hosted approximately 7,000 students, including undergraduate, postgraduate and research degree students.

The university was half-way through a strategy which defined the operational goals and investments needed to achieve the goals. The strategy was developed by both students and those working at the university to ensure they (employees and students) are the focus of the goals set. The strategy sets out the main areas of work for the university, including the approach used, the activities carried out and the assessment of results in practice for both education and research. The key focus here was on the provision of an academic environment that supported and facilitated the exchange of knowledge to develop the international academic and science community the university was in. The university aimed to do so by operating with a set of values in mind. These included the sustainability of research carried out at the university and the promotion of a culture which included openness, collaboration and the development of personal characteristics from all involved.

The strategic goals set for the university were educationally driven. However, within the strategy there was the acknowledgement that staff underpinned the best campus-based experience for all. The development of employees, in terms of potential and capabilities, was therefore vital for the university to operate. The provision of good leadership and employee support played a central role in the strategy development.

6.3 Themes that emerged from the analysis of interview discussions

The purpose of the interview discussions was to explore the factors that contribute to the development of innovative work behaviour and explore determinants of such development. The interviews focused on how the participants, as employees of the organisation, learned to develop innovative work behaviour in the workplace.

A full thematic analysis was carried out on the data collected through interviews and focus groups together as opposed to separate analyses for each. This was to allow for a comparison of qualitative findings to case study level.

The five main themes that emerged from the discussions with the participants (see section 6.1 on page 157 above) are reported further below.

6.3.1 The role of information literacy

Five of the twelve participants in this case study explained that information literacy is a contributing factor to innovative work behaviour development. Interview discussions centred on the specific role of information literacy in the initial stages of innovative work behaviour development. Information literacy is viewed as a skill set to help employees to learn in the workplace. The learning process then helps employees to develop innovative work behaviour. P76 explained that:

> "Yes of course there is. I think you [as an employee] have to be very information literate in order to be a good learner in a workplace […]. This helps to create new ideas. You have to be able to recognise what information is relevant for your job: what type of information you need and how you can get at that information." (P76, MS5: 247-250)

Three of the twelve participants felt that information is also an initiator and the 'first step' of innovative work behaviour. This is because information literacy helps to set context as to what needs to be learned to enable employees to innovate. For example, P80 noted that:

> "I think it [information literacy] does because somehow it gives the bigger picture, somehow the context of learning things there in that sense, so I think this is important." (P80, NMS5: 217-219)

166

Two participants also noted that information literacy is also both individual and collective. For example, individual employees can possess information literacy skills as noted above, but information literacy can be developed when working to innovate (e.g. when communicating and sharing ideas). Participants felt that this helps employees to share ideas to innovate or make changes. P79 said:

> "Since we're the communications department, there's always a need for more information and people [employees] always somehow experience that they didn't get enough information […]. We try to inform people [employees] about stuff and we're like 'How should we do this?' so the people know what they should know." (P79, NMS5: 170-175)

All participants also discussed the variety of information sources available for innovation. Focus of discussions were of people as information sources. Seven out of twelve participants explained that people are important information sources as information can be sought quickly and easily. People are also more interactive so information can be questioned if not understood. This is illustrated by a quotation from P79:

> "So obviously networking is very important because if you find the right person to answer your question it's so much faster than to just try to look it up on the websites." (P79: 189-192)

Four participants said that the interactions between people also act as an initiator of innovative work behaviour. For example, talking to employees about specific tasks helps to reflect on the processes involved. All of these participants explained that when interacting with other people, information is exchanged and employees can use this newly acquired information in the creation of their own ideas. This process occurs regardless of whether the people are internal or external to the university. P79 said:

> "Because their job is very similar to mine, I can maybe steal some ideas and learn some things so I think that's a good thing for me […]. I also try to keep up with or maybe go to lunch with a journalist or somehow keep up with how they are working and how their work situation is developing and all these things." (P79, NMS5: 207-213)

External information sources help to bring new knowledge into services within the university. Three participants said that as a result, employees learn and are able to create new ideas to solve problems in the workplace. The quotation from P78 below demonstrates how external knowledge is vital to initiate changes in processes and procedures (process innovation):

> "I also talked about it with our study psychologist, and then we were turning this idea round and looking at it and what could we do? And okay, so she already had some idea that she would." (P78, NMS5: 39-42)

Two of the twelve participants also highlighted issues which occur with information. In the workplace there is a vast amount of information from a variety of sources which is often too much for employees to process and use. The time required to analyse and understand the information hinders innovation when employees do not have enough time to do so. This is often a problem in university settings where work schedules are full. For example, P75 explained that:

> "Sure analyse it, but my personal problem with the massive amount of information received is that we don't have the time to analyse it." (P75, LS3: 201-207)

Thus, on the theme of information literacy, it can be concluded from the analysis of interview data from the Finnish case study that:

- Information literacy is important in the initial stages of innovative work behaviour to help to set context as to what needs to be learned to innovate.
- Information literacy is seen as a skill set to enhance workplace learning and this then supports innovation. Participants noted that information is taken from multiple sources, especially other people (as an information source) where information can be accessed, questioned and used quickly.
- Information overload hinders innovation when employees do not have time to innovate.

6.3.2 Information behaviours

From the analysis of interview data, it was found that several information behaviours contribute to innovative work behaviour development. Three of the twelve participants explained that information seeking and information access were viewed as barriers to innovative work behaviour development. If the navigation of the information source is difficult, searching for the information can take longer than expected. Employees may become frustrated. This frustration can lead to the early termination of the searching activity due to lack of patience the employee has. As a result of a lack of access to the information, the information is then not used by employees for innovation. For example, P74 explained that:

> "You sometimes think that "oh dear, the information is there." But they can't find it if it doesn't come in a really easy way, immediately when you Google it. So if you don't get the right answer, it doesn't exist, because you don't have the patience to put so much time into finding information." (P74, NMS5: 433-438)

Information interpretation and analysis was seen as an initiator of innovative work behaviour by interviewees. However, information interpretation only helps employees to learn (the mechanism that underpins innovative work behaviour) if meaning can be added to the information (i.e. employees can define the information, add context and can communicate this to another person). P72 said:

> "I always try to somehow re-write it [information] so it is easier and not just to send a link with 'read here'. It is good to have that link because sometimes you need to read more, but [it also helps to] summarise what you need. It takes time but I have come to the conclusion that it is better and easier to open." (P72, LS3: 305-309)

As noted by P7 above, information interpretation and analysis takes time. Employees often have little time to interpret and analyse information due to the scheduled of work and little pre-scheduled time to do so. When in employment at a university, employees often have multiple projects they work on simultaneously and this also reduced time available for information interpretation and analysis. A strong difference was noted by participants who

had previously been students before being employed. As students, there was more focused time for information interpretation and analysis whereas with employees this is not the case. For example, P75 noted:

> "When I did my PhD ten years ago […], I had four years to myself to gather the information and to analyse it and write it down. I don't have the time anymore." (P75: 213-216)

The analysis of information supports employees in presenting information to others. Information analysis helps employees to discuss ideas with other employees, and create new ideas, or adapt the already created ideas, with them (i.e. the first stage of innovative work behaviour). P82 noted that:

> "Then I use that to make a plan or suggestion or presentation for an idea or for the project plan." (P82, MS5: 284-285)

This sharing of information is an important activity to participants to help employees to learn. Employees share information to help them to discuss ideas and check how others complete certain tasks (e.g. processes and procedures in the workplace). The sharing of information helps employees to understand how to carry out their jobs more effectively and this is especially important in the informal workplace context. P74 explained that:

> "So we talk a lot together, share the information. Then I check with the colleagues 'How would you do that?' 'Oh, we do it like this, we could do it like that.'" (P74, NMS5: 69-71)

On the theme of information behaviours, it can be concluded from the analysis of interview data from the Finnish case study that:

- Information interpretation helps employees to understand the information and apply it to innovations.
- A lack of access to information and difficulties in the searching process hinders innovation. Information interpretation and analysis helps to add meaning to information. However, employees often have little time scheduled to analyse information in the workplace setting.
- When analysed, the information helps employees to present and share information with others to gather support for the creation of an idea.

6.3.3 Organisational culture

All twelve participants viewed organisational culture as a contributing factor to the development of innovative work behaviour. However, two of the participants noted that the culture must be related to the organisational strategy. Specifically, a strategy for innovation and change is important for the development of innovative work behaviour from employees. This is because the strategy sets expectations as to how employees should behave. Three of the twelve participants said that the strategy must be specific in terms of the goals set and the actions needed from employees to meet the goals. The impact of the strategy is only evident when the strategy is communicated to employees, implemented and supported by the organisational culture.

All interviewees discussed elements of the organisational culture which are vital for innovative work behaviour to occur. The culture must set out the expected behaviours form employees. These expectations must then be communicated with all employees. For example, P76 said:

> "Culture changes very slowly […]. We had a really big discussion [and created] a set of rules of how we want to behave or should behave. [This includes] things that we don't want to see happening. We really hope that these foster a climate which is good for learning and for innovating."
> (P76, MS5: 119-150 condensed)

The quotation from P76 above exemplifies the collective nature of organisational culture. P76 explained further that employees can work individually to support others. Working together as a group helps employees to discuss current problems in the workplace and actions needed to make changes, and this option was echoed by four other participants (of all employment ranks).

Another key element of organisational culture is the view on change. Interviewees indicated that there is a direct relationship between innovation and change. Change is a driver for innovation as it helps employees to create and implement new ideas in the workplace if supported to do so (e.g. through reflection). However, employees cope with change in different ways and some employees are resistant to the implementation of changes. The resistant employees need additional support to see the benefits of the changes. Getting

support from employees to implement the change was the biggest challenge in employee-led innovation as identified by interviewees. For example, P73 explained that:

> "Change is what drives innovation and innovation drives change […]. Some people tend to be afraid of change and set in their ways […] You need to constantly think of what you need, you can't work as you've done. […]. You need to change [to] learn more […]. Then you realise "okay, I could do it like this." (P73: 74-98)

The support network in the organisational culture helps employees to cope with change. Additionally, it helps employees to create and implement ideas themselves. For example, if employees have other employees to go to for support, this encourages employees to repeat the innovative work behaviour if successful advice is given. However, if employees do not have other people to discuss ideas with then this can hinder innovative work behaviour as ideas may not be taken forward. P82 discussed that:

> "You can be innovative yourself […]. I come up with ideas and I suggest 'you should change this process or document because you could do this and that' and that would be innovative as it would make it more efficient or enhance the quality, but you don't have a person to go to because it is not supported." (P82, MS5: 139-144)

All participants felt that support for innovative work behaviour is also available from other people in the workplace (e.g. leaders and external consultants). The availability of others widens the support network in terms of where employees can seek innovation support when required. P73 highlighted the importance of the behaviours in encouraging and supporting innovation from employees:

> "For my current position, innovation is really important not just because I'm working with trying to help people to innovate […], in order to do so I have to innovate myself as well […]. I really enjoy it and I'm really glad that my manager encourages that too. That's in fact what makes the job exciting for me is that I can." (P73, NMS3: 254-258)

Thus, on the theme of organisational culture, it can be concluded form the analysis of interview data from the Finnish case study that:

- Organisational both enhances and hinders innovative work behaviour development.

- The culture contributes to innovative work behaviour development as it is related to the strategy and employee expectations are communicated.

- Employees also need to be activity involved in making changes to the culture by discussion changes needed and consequences to actions. However, this can take time.

- The organisational view on change enhances innovation if there is a support network available for employees to see advice when needed (e.g. from leaders, immediate colleagues or external consultants). However, if there is little support network available this can lead to the early termination of innovation as the created ideas will gain little support.

6.3.4 Leadership and leaders within the organisation

The participants in this case study referred to leadership as a group of employees (leaders) who have a responsibility for individual employees, services or departments. The discussions in the interviews centred on the importance of leaders during the initial creation and championing of new ideas in the workplace. Eight participants said that leaders provide information on the initial problem, or specific reason, for the need to innovate. This is achieved during meetings with employees where the leader is able to gather employee opinions and interest. For example, P74 said:

> "Our boss has [sometimes] been on her weekly meeting, and then she tells us "Okay now girls, we need to think about this and this and this." Of course, some of us are more interested in new things than others, that there might be something that "oh no, do we have to do something again?" But there's always some of us that realise, "okay, this could be great." (P74, NMS5: 332-337)

The participants also said that leaders also provide reassurance and support for idea creation from employees themselves. In their opinions, this support encourages employees to take the ideas forward after initial approval, even if the leader does not provide any direct guidance on the idea. For example, P73 explained that:

> "He [the leader] expects and lets me be very independent so I mostly just tell him that this is what I'm going to do […]. He gives me a thumbs up. But he's very hands off-ish, which someone might find a little bit like they don't have any guidance." (P73, NMS3: 47-51)

The support from leaders is also important when leaders are positive about innovation. For example, enthusiastic leaders encourage employees to be innovative by promoting and reinforcing the behaviours needed from employees.

However, three participants said that the attitudes and behaviours of leaders can hinder innovation. The development of innovative work behaviour is only successful if the leader listens to employees, and the employees feel listened to. The leader does not necessarily have to agree with the idea but the attitude, beliefs and actions of the leader influences whether the employees feel they are able to approach leadership for support with the creation of new ideas that may influence change. The individual characteristics, values and beliefs here were noted by P77 who suggested that:

> "It's very important for the leader, and for middle management, to listen to the staff. It's very hard to do that, because there are always people who are really very critical, and they are against the changes. There are also [leaders] who are supportive, and who understand the crucial thing to learn new things." (P77: 356-360)

This is also the case if leaders are not approachable. The early termination of innovation can be initiated if no support is available to champion the idea. This can occur at any stage of the innovation process, but is evident in the idea creation phase as discussed by P82:

> "You can be innovative yourself […]. I try to learn myself and I come up with ideas and I suggest 'you should change this process or document because you could do this and that'. That would be innovative as it would make it more efficient or enhance the quality or something like that, but you don't have a person to go to because it is not supported." (P82, MS5: 139-144)

On the theme of leadership and leaders within the organisation, it can be concluded form the analysis of interview data from the Finnish case study that:

- Leaders provide emotional and practical support for the creation, championing and implementation of ideas in the workplace.
- The attitude and behaviours of leaders can hinder innovation if employees feel there is little support to champion and implement ideas they create.

6.3.5 Individual skills and abilities of employees

All of the twelve participants identified communication as a key skill to enhance innovative work behaviour. Participants said that this is because employees can communicate with each other to find out if other employees are working on the same kind of tasks or projects, to avoid the replication of projects. Additional information on support for implementation can be obtained from those working on similar work.

In additional, participants explained that communication supports the development of innovative work behaviour as employees can discuss the relevant task or problem and create new ways of being able to solve the problem at work. The communication helps employees to feel involved and valued in terms of discussing their opinions. P72, a leader of a team, said:

> "Everybody needs to feel involved and that they can say their opinion and really help. We need to discuss it and we have a workbook that we can take to the meetings and discuss the problems and how we can be better." (P72, LS3: 354-359)

Participants emphasised that communication is vital when making workplace improvements. It is viewed as a collective behaviour which involved multiple people. Communication helps employees to make improvements in the workplace as it is difficult to make changed independently. P75 noted that:

> "Communication is extremely important. Nobody can work single handed anymore, it's always a joint effort if you're going to improve work or anything so open communication in many sense is fundamentally important." (P75, LS3: 147-150)

Formal meetings were noted by five of the twelve participants as an important method of communication. The participants said that formal discussions help to facilitate the exchange of ideas in innovative work behaviour. Meetings that involve cross-subject employees (internally) allow employees to create new ideas. The championing of ideas is then a focus of group meetings to enable employees to explain the ideas, justification of the idea and for idea implementation seek the support needed. P78 explained that:

> "He [the service manager] also initiated this idea of having a meeting once a month with all the representatives of all the subject representatives. I brought this idea up that we have to do something about the problems in group work, and they need to be able to work together." (P78, NMS5: 34-38)

Participants also said that communication with external colleagues also helps in the exchange of ideas when finding solutions to common problems at work that require innovation. This is evidenced by the quotation from P75, a leader, below:

> "I meet my colleagues from the education services directors from all the 14 universities once a month. That's an excellent and extremely important way of learning […]. How we see the [service name] and how we deal with the issues that are basically common to all of us." (P75, LS3: 24-30)

However, participants also viewed communication as an inhibitor of innovative work behaviour. A lack of, or poor communication can inhibit innovation implementation if employees are not aware of the need for change and the impact change will have on them. P74 said:

> "There's not enough communication where we should actually sit down together. Not, I mean, necessarily face to face, but still to sit and discuss what does it mean for me? I mean, if there's some change in the strategy, what does it mean? What kind of new things do we have to take into consideration?" (P74, NMS5: 174-179)

Thus, on the theme of individual skills and abilities of employees, it can be concluded form the analysis of interview data from the Finnish case study that:

- Communication is vital for innovative work behaviour development.
- Communication is important to innovative work behaviour to facilitate the exchange of ideas in innovation.
- Communication helps with the acceptance of innovations and also promotes the championing of some ideas (e.g. through formal meetings).
- A lack of communication can hinder innovation if the support for the idea is not communicated to employees.

6.4 Findings from the quantitative questionnaire data analysis

The results of the questionnaire are presented in this section. The questionnaire was identical to that of the Scottish case study questionnaire in terms of the questionnaire design and distribution of the questionnaire to seek participants. Participants were asked to identify: (1) from a series of factors, how important they feel the factors are in being able to innovate at work; (2) the frequency in which they had participated in certain activities over the past year and; (3) demographic information and information on employment characteristics. For a detailed description of the questionnaire creation see Chapter 4.

6.4.1 Results of the statistical tests

Due to low response rates, it was inappropriate to undertake a factor analysis and a binary logistic regression analysis as with the Scottish case study questionnaire data. However, to enable comparison of the questionnaire results to that of both the Scottish and English case studies, a similar procedure was used to categorise variables into factors, and then explore the views of participants in terms of factors important for innovative work behaviour development.

The procedure carried out on the Finnish questionnaire data comprised: (1) an assessment of the groupings of the variables (reliability through Cronbach's alpha test) that were used to create factors 1-6 in the Scottish case study; (2) the creation of a new set of independent variables to encapsulate the relationships in the data and; (3) multiple t-tests to explore the importance of the factors in the development of innovative work behaviour.

Prior to this analysis, exploration of the Scottish case study data revealed 6 factors emerged from a factor analysis test. Therefore, the six factors were used as a basis for the analysis carried out on this data.

For each set of variables (i.e. those that were used to create the six factors from the Scottish case study), Cronbach's alpha test was carried out (Field, 2009). Cronbach's alpha is a test of reliability and consistency of a set of variables that are suggested to measure the same concept. The purpose of this test was to measure the internal consistency of the variables (i.e. how closely related they are).

The results of the reliability testing were then used to create a new overall variable to reflect, and allow comparison to, each factor of the Scottish case study factor analysis. Once the new variable was created, one sample t-tests were carried to explore whether the responses from participants differed from the neutral option in the questionnaire question responses. This t-test used the value of 4 as the comparison value as participants were asked to indicate this value if they felt the importance of the factor to the development of innovative work behaviour was neutral (i.e. neither high or low importance).

The results of the Cronbach's alpha test for all factors is presented in Table 26 below.

Table 26: Cronbach's alpha statistics for all six factors

Factors	Cronbach's alpha (α)
Skills	.880
Knowledge sharing	.984
Training and learning	.714
Access to resources	.753
Personal drive and leadership	.731
Organisational goals and strategy	.592

One sample t-tests revealed that there was a significant difference between the ratings of individual skills relevant to information behaviour as important to the development of innovative work behaviour and that of the neutral score of 4, $t(14)=15.768$, $p<.05$. Participants rated individual skills relevant to information

behaviour as more important to the development of innovative work behaviour than the neutral score (mean = 6.1).

There was a significant difference between the ratings of knowledge sharing as important to the development of innovative work behaviour and that of the neutral score of 4, $t(14)=3.796$, $p=.001$. Participants rated knowledge sharing as more important to the development of innovative work behaviour than the neutral score (mean = 5.2).

There was also a significant difference between the ratings of training and learning as important to the development of innovative work behaviour and that of the neutral score of 4, $t(17)=13.324$, $p<.05$. Participants rated training and learning as more important to the development of innovative work behaviour than the neutral score (mean = 6.0).

One sample t-tests revealed that there was a significant difference between the ratings of access to resources as important to the development of innovative work behaviour and that of the neutral score of 4, $t(17)=8.612$, $p<.05$. Participants rated access to resources as more important to the development of innovative work behaviour than the neutral score (mean = 5.7).

There was a significant difference between the ratings of personal drive and leadership as important to the development of innovative work behaviour and that of the neutral score of 4, $t(17)=14.403$, $p<.05$. Participants rated personal drive and leadership as more important to the development of innovative work behaviour than the neutral score (mean = 6.1).

There was also a significant difference between the ratings of organisational goals and strategy as important to the development of innovative work behaviour and that of the neutral score of 4, $t(17)=10.723$, $p<.05$. Participants rated organisational goals and strategy as more important to the development of innovative work behaviour than the neutral score (mean = 5.8).

6.5 Chapter conclusion

The findings from the analysis of interview data reported in this chapter have evidenced the contribution of information literacy, information behaviours, organisational culture, leadership and communication to the development of innovative work behaviour through workplace learning. Evidence is also

presented as to the interrelations between themes and the contribution of multiple themes to the four main innovative work behaviour processes (recognition of innovation need, creation of ideas, championing of ideas and implementation of ideas). The contribution of each theme to the innovative work behaviour processes are shown in Table 27 below.

Table 27: Contribution of each theme to each innovative work behaviour process

Innovative work behaviour processes (West & Farr, 1990)	Contributing factors to innovation (themes from participant responses)								
	Information literacy	Information and knowledge sharing	Information searching	Information interpretation and analysis	Culture	Leadership	Individual skills and abilities of employees	Training and learning*	Access to resources*
Recognise the need to innovate	X		X		X	X	X		
Create idea	X	X	X	X		X	X		
Champion idea	X	X		X	X	X			
Implement idea		X		X	X	X			

*it was not possible to determine the impact of these factors on the stages of innovative work behaviour specifically. However, finding, suggest these are important for innovative work behaviour overall.

181

A summary of the contribution of each theme to the development of each innovative work behaviour process (West & Farr, 1990) is presented in Table 27 on page 181.

Information literacy contributes to the creation of ideas as employees suggested that information needs recognition helped them to take action in how to behave with information to innovate. At the same time, individual information behaviours contributed to the development of several innovative work behaviour phases. For example, information and knowledge sharing is beneficial during the idea creation and championing processes whereas innovation can be terminated if initial information behaviours of searching and access are difficult to carry out. The findings form the analysis of questionnaire data highlight that skills in information are important for innovative work behaviour. However, it was not possible in this case study to identify specific behaviour and tasks that information skills bear influence on.

The analysis of both qualitative and quantitative data has highlighted the importance of knowledge sharing in the development of innovative work behaviour. However, further details were given during interviews in terms of the interaction with multiple sources of information (e.g. people) and the benefit of being able to question information sought. Both qualitative and quantitative data analysis revealed the importance of the role of the organisation collectively. Data from interviews suggested that the view towards risk and change and the availability of a support network (within the organisational culture) can help innovative work behaviour to develop. However, the focus of the quantitative is that of the organisational strategy and the importance in the development of innovative work behaviour (it must be noted here that strategy was discussed briefly during interviews but primarily regarding the communication of the strategy detail).

A key contributing factor to the development of innovative work behaviour is leadership. The findings suggest that leadership has a close relationship with organisational culture (i.e. leaders help to promote the culture) and also to help employees communicate with others. In the analysis of the questionnaire data, leadership as also deemed important for innovative work behaviour.

Organisational culture is important for innovative work behaviour as identified in the analysis of questionnaire data. The participants who were interviewed noted that the culture enhances innovative work behaviour if related to the organisational strategy and supports employees through times of change.

The participants in this study explained that communication is a key skill to enhance innovative work behaviour, specifically in the sharing of information which is rated to innovation. However, communication can inhibit innovative work behaviour if not carried out correctly. Although interview participants did not discuss personality, personal drive was identified as important for innovative work behaviour in the questionnaire.

The analysis of the questionnaire data highlighted two factors that are important for innovation. These are training and learning and, access to resources. However due to the small sample size, it was not possible to explore the impact these factors have on learning and innovation activities.

The findings presented in this chapter also highlight the complexity of the views between different employment ranks of the university. For example, leadership employees felt that communication was key to the development of innovative work behaviour and made no negative comments surrounding communication. However, the managerial employees discussed vital improvements required in the area of communication to support the improvement of the organisational culture and knowledge sharing.

It is evident from the analysis of the interview data reported here that the central focus of innovation within the university is relevant to the processes and procedures (De Vries et al., 2015). This was highlighted in the multiple examples that the participants gave in how they attempt to improve the processes and procedures of the departments they are in. The overarching organisational innovation (i.e. improvements to the business structures and practices) is at the heart of idea creation of this university yet the lower level innovative focus of behaviour of employees remains that of the internal processes and procedures. The discussion of the initial stages of innovative work behaviour from participants (i.e. creation and championing of ideas) provides evidence to suggest that the university may have some resources and knowledge relevant to the initiation of innovation. However, the lack of focus on

fully implemented innovations from participants of this study suggests that the university is yet to reach higher levels lower levels of innovation maturity. As this university was only half-way through the current organisational strategy at the time of data collection, it could be suggested that the ideas currently in preparation at the time of the data collection had not matured enough to be fully implemented in practice.

From the findings of this study it is also evident that innovation practices within departments may differ to others, and this adds emphasis to the importance of context in the development of innovative work behaviour from employees. However, to fully understand the contextual differences in the development of innovative work behaviour other workplace contexts must be explored. Therefore, presented in the next chapter are the findings from a case study where data collection was carried out in England. This case study is of a different organisational setting (i.e. healthcare as compared to education), however, the procedures used to collect interviews and questionnaire data were identical to those of the other two case studies to enable data comparison.

Chapter 7: Findings from English case study

7.1 Introduction

In this chapter, the findings are presented from the analysis of data collected from interviews, and a quantitative questionnaire in a National Health Service (NHS) Trust in England. As with the Scottish and Finnish case studies, the same study aims and approach were used to furnish knowledge on the development of innovative work behaviour. However, here this is achieved through the lens of a different organisational context (i.e. healthcare as opposed to a university setting).

The sample comprised twelve interview participants. One hundred and four participants completed the questionnaire either in part or full (see section 4.5.9.2 on page 123). As with the other case studies in this thesis, the interviews were semi-structured in design and underpinned by Bandura's Social Cognitive Theory (see Chapter 3). Similarly, the design of the quantitative questionnaire was informed by the literature that underpins this thesis (see Chapter 2) and a validated scale of workplace learning.

Here the main themes that emerged from the analysis of interview discussions with the participants and the relationships that emerged from quantitative questionnaire data analysis are presented. To this end, the chapter begins with information on the context to the English case study (section 7.1.1) and is followed by a discussion of the main themes that emerged. These are:

1. Specific information behaviours that contribute to the development of innovative work behaviour (section 7.2.1);
2. The culture of the organisation (section 7.2.2) and;
3. Individual skills and abilities of employees (section 7.2.3).

The findings from the quantitative questionnaire are then presented in the final section (section 1.4) followed by a conclusion to the chapter (section 1.5).

7.1.1 Context to the case study setting

In this section, additional information as to the context of the English case study, a National Health Service Trust (NHS Trust), is provided. This includes details of the strategic aims and direction and steps taken by the NHS Trust to

improve innovation. This is followed by an explanation of the sample for the interview data collection.

7.1.2 Context to the English National Health Service (NHS) Trust

This case study organisation was a National Health Service (NHS) Trust in England. At the time of data collection, the NHS Trust provided a wide range of services across multiple sites to the local area, including hospitals, medical practices and outreach services, collectively operated by over 5,000 employees. The Trust worked with a vision to have high quality safe and personal care for patients and to allow patients to have choice in the medical care provided. To do so, the Trust aimed for employees to use the skills they develop in the workplace to treat the patients who use the services of the Trust. The NHS Trust values therefore focused on patients in terms of the quality of care received, but also ensured that suitable finance, infrastructure and support were available for employees when needed to provide the high quality care.

Before data collection commenced, the Trust had formed a strategic partnership with another local NHS Trust. The operations of each Trust remained separate (e.g. patients were cared for at one site only). However, plans were in place to develop the partnership further for the purpose of making improvements relevant to combining policies, funding available for the Trusts and learning experiences for employees within both NHS Trusts. The case study data collection for this work took place on the site of the English NHS Trust and not the site of the partner NHS Trust.

At the time of data collection, the NHS Trust was half-way through two strategic plans:

1. A Business and Operation Development Strategic Plan;
2. A Research and Innovation Strategic Plan.

The Business and Operation Development Strategic Plan was developed taking into account other local and national strategies already in place (e.g. those developed by other Trusts and the wider UK NHS). The focus of this plan was of the patient experience (e.g. access to emergency care) and problems which regularly affect the wider NHS (e.g. patient waiting times for assessments and

operations). The strategy was heavily populated with statistics on the local population, healthcare issues faced by the local residents and the performance of the NHS Trust. Therefore, the goals set in the Business and Operation Development Strategic Plan reflected issues that were seen to impact the users of the Trust at the time of data collection (e.g. staffing, funding, waiting times, service capacity and demand). The focus of the Business and Operation Development Strategic Plan was not of innovation or employee development. Innovation was the focus of the Research and Innovation Strategic Plan.

The Research and Innovation Strategic Plan set out the vision, values and future actions of the Trust for research and innovation development in line with the wider national NHS research and innovation vision. The vision detailed in the strategy aimed to promote research and innovation across the Trust with a consequence of the provision of a high quality and service to patients within a sustainable business environment. This Research and Innovation Strategic Plan focused primarily on behaviours required by employees and the pathways available for employees to innovate. The aims of the strategy included to:

1. Engage and enhance patient and staff involvement in research and innovation;
2. Foster collaborate working relationships with internal and external partners, including academics and industry;
3. Foster a culture of research and innovation throughout the organisation and promote research and innovations that improve quality, patient safety and reduce costs;
4. Provide staff with the tools, training, support and guidance to deliver high quality research and innovation (as applicable to healthcare) that will directly benefit patients.

Since the publication of the Research an Innovation Strategic Plan, the NHS Trust had taken steps towards improving Research and Innovation. The steps, ongoing at the time of data collection, included:

- The creation of the Research and Innovation department to encourage innovation support staff to behave innovatively. The department supported staff to create ideas, develop the ideas implement ideas in the workplace and create a culture where interaction between research and

innovation, and the beneficiaries of this work (e.g. researchers, practitioners and innovators);

- In partnership with a local academic health science network, the provision of peer-support for employees who have created ideas but were unsure how to take the ideas forward. The peers helped to identify innovative ideas, provided advice as to the processes of development and implementation in the Trust;

- The development of a new clinical research network in 2014 to improve efficiency and effectiveness of research delivery (as part of a wider national reform);

- Becoming a partner in the local academic health sciences network to facilitate and deliver innovation with other NHS Trusts, higher education institutions and public health social care providers and industry;

- The development of a research and innovation collaborative partnership with a local NHS Trust, where the leaders of each trust met regularly and shared work and progress towards a shared research and innovation strategy.

7.2 Themes that emerged from the analysis of interview discussions

As with the Scottish and Finnish case studies (see Chapters 5 and 6), the purpose of the interview discussions was to explore the factors that contribute to the development of innovative work behaviour. The interviews focused on how the participants, as employees of the organisation, learn and develop innovative work behaviour in the workplace.

Three main themes emerged from the discussions with the participants. The sections that follow give details of the themes that emerged. These are:

1. Specific information behaviours that contribute to the development of innovative work behaviour (section 7.2.1);
2. The culture of the organisation (section 7.2.2) and;
3. Individual skills and abilities of employees (section 7.2.3).

The themes are explained in further detail in the sections that follow.

7.2.1 Specific information behaviours that contribute to the development of innovative work behaviour

The participants in this case study discussed the contribution of information behaviours to the development of innovative work behaviour. The discussions centred on the importance of specific information behaviours during the initial stages of innovative work behaviour (i.e. idea creation and championing). Information interpretation acts as an initiator of idea creation. This is because information interpretation (and the need to interpret information as part of a job role) can help employees to recognise that ideas need to be created to streamline information interpretation processes. For example, P46 said:

> "We have programmes where we can see everything that needs a report [on spreadsheets] and we can see everything that has been reported but I know that there wasn't any kind of mechanism in place to just see who was doing what and how quick the turnaround times were for tasks [….] We've been able to put that in place […]. I know that they now use those spreadsheets." (P64, NMS6: 208-216)

Additionally, three participants said that information sharing (especially employees giving information to others who have experience in creating and implementing ideas) helps the employees to develop the ideas further once the ideas have been created. Specifically, the sharing of the created ideas with other employees within the organisation helps the idea creators (employees) to gather information from other employees on types of support available (to them) to develop the idea further towards implementation. This information exchange creates new knowledge for the recipient on pathways to implement innovation. This new knowledge can then be used next time the employee (information recipient) creates and wishes to implement new ideas. For example, P69 said:

> "I proposed the idea to one of the consultants in the emergency department […]. She thought it was quite a good idea and encouraged me to kind of pursue that idea […], she recommended the hospital innovation team which I wasn't aware of. I didn't think a hospital had its own innovation team." (P69, NMS4: 95-101)

However, the action of information sharing, according to two participants, is only beneficial to the employees who create ideas if the same employees take action

189

on the recommendations made by others (i.e. to approach innovation services for support). During the interview discussions, P96 emphasised actions taken by himself and the benefits he saw from his actions. P69 noted that:

> "I got in touch with them [innovation department] and we scheduled a meeting and I drafted a proposal in terms of my idea […] It's looking promising and they were quite helpful, the innovation team got in touch with universities and I've been told that there's one university that's interested in my work." (P69, NMS4: 103-106)

Furthermore, participants said that information sharing helps employees to overcome challenges that may prevent the employees from displaying innovative work behaviour in the future. This is particularly evident when employees have a lack of confidence in creating ideas if they are unsure about the relevance of the ideas to the problem in hand. The sharing of information regarding the idea (i.e. explaining the idea to others in the workplace) helps employees to gain support for the creation of that specific idea. As a consequence, the reassurance from other employees positively reinforces the idea creators and encourages the idea creators to repeat the innovative work behaviour in the future. P63 explained that:

> "Especially simple ideas, you think that's a bit of a daft one. It's not important but then actually you realise it's had a really big impact. So it's getting that message out there which I think is a bit of an issue." (P63, NMS2: 56-58)

The participants in this study also identified that people are an important information source (e.g. when sharing information as noted above). People (e.g. employees) are seen as important as they hold specialist expertise that others do not. This expertise (e.g. knowledge or skills) can be shared with others and applied in the workplace to help non-experts to solve problems and innovate at work. P65 noted:

> "There are people that have special skills in certain areas. So, if it's something to do with data entry and spreadsheets I'd probably go to one of the team that works in that particular area more than anything else. If it was clinical medical knowledge I would probably ask another specialist

nurse or a doctor who has specialist knowledge in that area, so an expert." (P65, NMS2: 201-215)

However, one of the participants in this study (P63) explained that care must be taken to ensure that information is presented at a suitable level to allow the information to be understood by the recipients. If done so, this helps to reduce the risk, and potential challenge, that employees may receive and read information but not actually understand it.

Another additional challenge discussed by two of the participants in this study (P66 and P70) was information overload. Information overload occurs when information is given to employees from multiple sources (e.g. in person, through intranet posts and emails) in vast amounts and employees are unable to process all information adequately. The information overload increases the possibility that the employees may miss some important information as they do not have the capacity to read and utilise all information they are given. As a consequence, potentially important information (to innovation) may be missed, and can lead to the early termination of innovative work behaviour due to the lack of information used (a challenge difficult to address with the vast amount of information received daily according to participants of this study). P70 highlighted this in his example of innovation relevant information:

> "I guess the problem at the moment is there's too much information [....]. For example, with the [name of the innovation scheme], the exposure to that email is so lost somewhere within all the communications that are going on. We want to take precedence over other communications and it's going to be really difficult." (P70, LS4: 219-223)

Thus, on the theme of information behaviours, it can be concluded form the analysis of interview data from the English case study that:

- Information behaviour is a factor that contributes to the development of innovative work behaviour.
- Information interpretation and information sharing help employees to create new ideas and gather information, to facilitate progression towards idea development and implementation.
- People are an important information source to support the exchange of new ideas and to give support to the employees who create the ideas

(e.g. to increase confidence). This helps the idea creator to overcome challenges that may hinder innovation.

- However, information must be presented to the recipients in a format understandable to them otherwise this can hinder innovation.

- The issue of information overload that can also lead to the early termination of innovative work behaviour if not addressed.

7.2.2 Organisational culture

All twelve participants in this case study explained that the organisational culture contributes to the development of innovative work behaviour. Multiple elements of the (collective) organisational culture support the creation of new ideas and the implementation of those ideas. Initially, a supportive culture is needed to encourage and foster the creation of new ideas in the workplace. The creation of new ideas helps to overcome challenges faced by the NHS. For example, P65 explained that:

> "The department I work in [is] a little bit more focussed on innovation because that's what we are […]. There's a positive culture there in terms of fostering good ideas and nurturing things […]. We need innovation to be able to overcome the challenges in the NHS. It's not going to be done without it [a culture to foster innovation]." (P65, NMS2: 92-100)

In addition, four of the participants said that organisational culture (collectively) must be receptive to change. Preferred is a culture that (collectively) welcomes change allowing employees to take steps towards the implementation of new ideas in the workplace, even if the implementation does not fully go to plan. The process of other employees such as leaders listening and being receptive to the suggestions of employees during the process of idea creation supports the development of innovative work behaviour by encouraging employees to replicate the behaviour they exhibit (e.g. creating new ideas and seeking support from them). This is exemplified by the discussions that took place with a leader of a medical department, P70:

> "Being receptive to change […], it's not necessarily that you have to do it but at least be receptive and listening to things and say, 'Okay we will try this […]!' Often what happens in big organisations is change is not seen

as a good thing because then it disrupts everything else […] that usually is a hindrance to people wanting to change." (P70: 178-185)

Four of the twelve participants highlighted the importance of people for support as part of the collective organisational culture. People help to encourage other employees to innovate by providing additional support if employees are unsure, or have questions. During the interviews, discussions with the participants centred on the importance of leaders (as individual people) as contributors to the development of innovative work behaviour. Leaders provide the means to foster innovation. For instance, leaders create environments that stimulate employees to innovate. These kind of environments (as well as the leaders) help employees to create new ideas and champion (share) those ideas. For example, P65 said:

> "My previous line manager was very proactive in terms of innovation and developing good practice and nurturing that kind of environment […]. That has resulted in a couple of ideas which have been taken from that department and shared across the organisation as a whole." (P65, NMS2: 87-92)

In addition, three of the twelve participants said that leaders provide guidance and support to encourage employees to develop new approaches to work. This does not necessarily have to be the creation of new ideas but instead could be approaches that the leaders have knowledge of, or approaches they have used previously. Seeking guidance from leaders encourages the employees to try new approaches to their own work, which then acts as positive reinforcement to the approaches attempted (i.e. the employees will behave that way again if successful). For example, P69, a non-managerial employee, explained that:

> "If I'm in doubt with any particular area then I'll ask my seniors who will be able to guide me and offer a solution for example, and then the next time I go to do that procedure again or that scenario, I'll follow that approach and see whether it works out." (P69, NMS4: 169-173)

As well as offering guidance, the actual behaviours of the leaders themselves can influence the innovative work behaviour of employees. The behaviours of leaders can mirror the opinions and values that they hold (e.g. whether the leaders welcome risk taking from employees or not). This can then impact on

the innovative work behaviours of employees. During discussions, this was exemplified by P60. Although a manager, she gave her example from the viewpoint of an employee.

> "We had a manager that was very risk averse. It was like, 'you copy me into everything. Nothing goes unless I'm copied in' […]. I now know the difference between being managed by someone who is risk averse and someone who isn't, and how that can encourage innovation." (P60, MS1: 63-68)

On the theme of organisational culture, it can be concluded from the analysis of interview data from the English case study that:

- The organisational culture can collectively influence employee innovative work behaviour (e.g. by fostering new ideas or welcoming change).
- Individual people in the workplace (e.g. leaders), who are part of the organisational culture, can also contribute to the development of innovative work behaviour.
- This is achieved through the provision of an environment to foster innovation and behaving in ways to reflect the behaviours that leaders want their employees to exhibit (e.g. being proactive and seeking new approaches to work).

7.2.3 Individual skills and abilities of employees

The participants highlighted that the skills and abilities of employees were highlighted by interviewees to contribute to the development of innovative work behaviour. The participants explained that skills and abilities can take two forms: skills and abilities that involve and influence others (e.g. communication and reflection) and skills and abilities related to individual employees (e.g. reflection, fear of failure, and mind-set).

Discussions with four participants (P60, P62, P63, P70) centred on communication as a skill that influences others (e.g. the communication of ideas to other employees). Communication with others contributes to the development of innovative work behaviour because it enables employees to recognise that they are innovating from the behaviours they display to others. For example,

P70 below, illustrated this through his communication with others. P70 discussed that:

> "Sometimes people don't know that they're innovating or they don't know where to go. So sometimes innovation sounds like, 'What is this?' […]. You start off with a question and then you start to link in people who can actually answer those questions […] my own innovation behaviour is there is a problem, and there is a link between that and that, and if we could take this away, how could this work?" (P70, LS4: 45-57)

At the same time, three participants said that communication helps to share the newly created ideas. The purpose of doing so is to promote the newly created ideas and gather support (champion) the ideas. In addition, the sharing of the idea within the community facilitates ongoing dialogue about innovations. This dialogue serves to highlight any other ideas that may be similar in design so that employees can develop knowledge on the work that other employees are doing. As a consequence, the possibility of (unknown) idea replication of other or older innovations is reduced. The unintended replication of ideas (across NHS Trusts) was a problem discussed by P60, an employee within the Innovation Services of the Trust. P60 said:

> "There's so much good stuff going on, but sometimes it's replicated. And the problem is we don't shout about what we do enough, that lots of people go and do the same project a hundred times over in different hospitals." (P60, MS1: 315-320)

P60 also noted that the sharing of ideas requires improvements within the NHS Trust. At the time of data collection part of P60's role was to support the sharing of innovations through showcases and innovation related events. She explained that employees within the Trust often think they are innovating well, but in reality improvements could be made in terms of sharing (or showcasing) the innovations more widely within the Trust.

Engagement is also a contributing factor to the development of innovative work behaviour according to three participants in this study. They explained that engagement involves personal skills that help people interact and this can relate to the communication discussed above (i.e. communication and engagement both involve skills in social interaction). The participants felt that engagement is

important to help people question the trends or processes that occur within the Trust. Employees evaluate the trends and processes within the Trust to decide (or recognise) whether there may be the need to make changes or create new ideas.

Two participants (P64 and P69) in this study noted that they had concern over consequences to failure if they create ideas and the idea implementation fails. Although one participant (P69) noted that failure is an important process in learning (i.e. to evaluate the processes used) to make improvements, other participants highlighted concern that there may be punishment for failure. This could relate to the culture of the organisation and the dominance of risk taking and change (see section 7.2.2 for an explanation of the influence of organisational culture on innovative work behaviour development). P64, an employee whose role focused primarily on patient care, noted that the lack of consequence for employee failure would promote more reflection to make improvements to the innovation as employees would not fear they may be punished for failure. P64 said:

> "There's no punishment for failure so we can go. That didn't quite work but here's why it didn't work and we're going to fix it." (P64, NMS5: 136-138)

However, two participants felt that to have the confidence to make mistakes and reduce the fear of consequences to failure, employees must develop a suitable innovation related mind-set. This is because a positive innovation related mind-set (e.g. a positive attitude towards innovation) helps the employee to behave in a way to create new ideas and implement the ideas in the workplace. The positive mind-set also acts as vicarious reinforcement (i.e. the tendency to repeat behaviours of there is a reward involved) and encourages other employees to behave the same way. If employees see positive consequence of the behaviour of others, they may behave in the same way in the hope to also experience positive consequences. The vicarious reinforcement was demonstrated through discussions with P63 who explained that:

> "I come across health care assistants and nurses [who] are really great at innovating. [They have] that mind-set of 'This is really good and I'm going to encourage other people to do similar'." (P63, NMS2: 83-85)

On the theme of individual skills and abilities of employees, it can be concluded form the analysis of interview data from the English case study that:

- Skills and abilities are two-fold: skills and abilities serve to encourage interaction and knowledge sharing process between employees (e.g. communication and reflection) to facilitate ideas creation and championing.

- Secondly, skills and abilities that are also related to the individual abilities of employees and these also enhance innovative work behaviour development.

- Skills and abilities also serve to help employees overcome challenges that may be presented when creating and implementing ideas (e.g. fear that innovations may fail but failure helps the learning process).

7.3 Findings from the quantitative questionnaire data analysis

As with the questionnaire in the Scottish and Finish case studies, participants were asked to identify: (1) from a series of factors, how important they feel the factors are in being able to innovate at work; (2) the frequency in which they had participated in certain activities over the past year and; (3) demographic information and information on employment characteristics. For a detailed description of the questionnaire creation see section 4.5.2 on page 105 in Chapter 4.

7.3.1.1 Reduction of independent variables to fewer factors

The same procedure as in the Scottish Case Study was used to carry out the Exploratory Factor Analysis (see section 5.4.1.1 on page 148 of Chapter 5). The same variables were also entered into the analysis as in the Scottish Case Study. The purpose of doing so was to explore whether the results of the Exploratory Factor Analysis would group variables together in a similar way to the Scottish Case Study. This procedure also increased the comparability of the findings of the Scottish questionnaire statistical analysis with the statistics analysis of the English Case Study questionnaire. A direct comparison of the results is presented in the discussion of this thesis (see Chapter 8).

As part of the factor analysis, a Kaiser-Meyer-Olkin (KMO) sampling adequacy test was carried out. This test indicated the proportion of variance within the variables that may be caused by underlying factors. The results indicated a KMO value of .800 which enabled the conclusion that the data was likely to factor well together. This means that the probability that the sample is adequate is very high and it is suitable to continue with the Factor Analysis. At the same time, a Bartlett's Test of Sphericity test was carried out. This statistic tests the relationships (e.g. correlations) between the variables as the variables must be related to be able to carry on with the factor analysis (i.e. there would be no reason to carry out a factor analysis if all the variables were independent of each other and not related). The Bartlett's Test of Sphericity was significant at $p<.001$. This indicated that the correlations in the analyses were not too small and relationships between the independent variable were detected.

As part of the analysis non-significant contributions were supressed to indicate only significant contributions (of the variables) to the factors. Additionally, any contributions to the factors (known as factor loadings) that were less than 0.3 were also suppressed in the presentation of the loadings. The test resulted to the creation of five new factors, as opposed to six in the Scottish case study. The contribution of each independent variable to the new factors are detailed in Table 28.

Table 28: The contribution of independent variables to the five factors, adapted from the SPSS output of the English case study

Variables entered into the factor analysis	Components (factors)				
	Skills in information	Access to resources	Knowledge sharing	Training and learning	Organisational goals and strategy
Your skills in analysing information	0.905				
Your skills in interpreting information (e.g. statistics)	0.892				
Your skills in sharing information (e.g. knowing techniques for passing information onto others)	0.846				
Your skills in retrieving information (e.g. knowing how to access relevant material)	0.801		0.332		
Your skills in searching for information (e.g. knowing where to look)	0.783				
Your skills in presenting information	0.630				0.376
Access to physical space for independent work		0.841			
Access to a physical space for collaborative work (e.g. comfortable space away from desk, staff common room)		0.840			
Access to appropriate tools and technology (e.g. computer facilities, new software)		0.603		0.546	
Ease of participation in training opportunities (e.g. training activities scheduled at a suitable time for me)		0.598			0.313
Your actual participation in training opportunities (e.g. whether you participate in training		0.564	0.364	0.488	
Institutional direction (e.g. organisational strategy that promotes innovation)		0.452	0.301		0.364
Internal knowledge sharing (i.e. between colleagues)			0.768		
External knowledge sharing (e.g. with peers at conferences)			0.737	0.480	
Knowledge transfer from external environment into internal environment (e.g. news from conferences)			0.707	0.401	
Personal enthusiasm			0.701		
Your ability to cope and deal with change			0.516		0.409
Opportunities to collaborate with others (e.g. in mentoring relationships)				0.779	
Designated time for learning and development activities (e.g. for training)				0.703	0.457
Availability of training opportunities		0.358		0.565	0.388
Supportive leadership (e.g. approachable and supportive managers)		0.337			0.728
Personal belief in the goals and strategy of the organisation		0.331	0.334		0.642
Quality of communication between colleagues			0.324	0.333	0.618
TOTAL VARIANCE EXPLAINED BY FACTOR	**40.60%**	**12.90%**	**7.90%**	**5.30%**	**4.60%**

*Individual variables are highlighted to indicate inclusion in each component (factor). The variables highlighted in the variable name column indicates no contribution of this variable to any component (factor).

Details of the contribution of the independent variables to the five new factors are presented in Table 28. To name each of the new factors, consideration was given to the independent variables that contributed to explaining each factor (see Table 28 above).

In the next stage of the analysis, the five factors resulting from the factor analysis were entered into a Binary Logistic Regression model along with demographic variables. The preparation, procedure and results are explained in the section below.

7.3.1.2 Regression to explore predictors of learning and innovation activities

As with the Scottish case study, a Binary Logistic Regression was conducted to explore the probability of whether the variables in the above factor analysis predicted whether participants carried out learning and innovation related activities or not. The analysis was used to calculate the likelihood (or odds) that the independent variables would predict the dependent (outcome) variables.

All predictor variables were entered into the Binomial Logistic Regression model in SPSS separately for each outcome variable to explore the influence of predictor variables individually. In addition, during each analysis, gender, age group, length of service and employment rank were included into the analysis as covariates. This was because these variables could have influenced the effect of the predictor variables on the outcome variables. The inclusion of gender, age group, length of service and employment rank meant that the results of the results of the binary logistic regression were more valid to highlight the relationships found between the predictor variables and the outcome variables.

The results of each Binary Logistic Regression model are summarised in Table 29 below.

Results of the binary logistic regressions indicated that there were no significant predictors of the learning and innovation activities which were: (1) performing new tasks; (2) creating new ideas alone; (3) observing and replicating others'

strategies and (4) finding a better way to do a task by trial and error. Therefore, these are not reported in Table 29 below.

Table 29: Results of the Binary Logistic Regression (adapted from SPSS output)

Dependent Variable	Independent Variables	Coefficient	S.E.	P value	Odds Ratio	95% C.I.for Odds Ratio	
						Lower	Upper
Working alone or with others to develop solutions to problem	Access to resources	1.36	0.803	0.09	3.895	0.807	18.797
	Constant	-1.783	0.519	0.001	0.168		
Work with others to create new ideas	Access to resources	1.36	0.803	0.09	3.895	0.807	18.797
	Constant	-1.783	0.519	0.001	0.168		
Acquire new information	Skills of employees in information	0.867	0.397	0.029	2.381	1.093	5.184
	Organisational goals and strategy	0.615	0.467	0.187	1.85	0.741	4.617
	Knowledge sharing	0.679	0.382	0.075	1.972	0.933	4.168
	Age group			0.062			
	Age 16-34	3.509	1.44	0.015	33.402	1.986	561.717
	Age 35-44	4.216	1.655	0.011	67.768	2.646	1735.357
	Age 45-54	3.009	1.418	0.034	20.258	1.257	326.524
	Constant	-2.215	1.219	0.069	0.109		
Ask for advice	Training	1.029	0.548	0.061	2.798	0.955	8.198
	Age group			0.026			
	Age 16-34	3.554	1.31	0.007	34.966	2.684	455.598
	Age 35-44	3.707	1.411	0.009	40.711	2.562	646.815
	Age 45-54	2.061	1.249	0.099	7.855	0.679	90.842
	Constant	-2.608	1.09	0.017	0.074		
Follow developments in their field	Knowledge sharing	1.929	0.924	0.037	6.881	1.126	42.05
	Leader or Manager (employment rank)	2.472	1.054	0.019	11.844	1.501	93.436
	Constant	-3.32	1.007	0.001	0.036		
Use self-study materials	Skills of employees in information	1.919	0.86	0.026	6.814	1.263	36.774
	Training and learning	1.017	0.566	0.072	2.766	0.913	8.379
	Length of service			0.056			
	Employed 1-6 years	3.856	1.51	0.011	47.288	2.453	911.546
	Employed 7-10 years	4.307	2.287	0.06	74.241	0.84	6562.252
	Employed 10+ years	1.715	0.978	0.079	5.557	0.817	37.775
	Constant	-3.227	1.05	0.002	0.04		
Receive feedback from others on your work	Organisational goals and strategy	2.502	1.01	0.013	12.206	1.686	88.356
	Length of service			0.071			
	Employed 1-6 years	3.975	1.618	0.014	53.266	2.235	1269.366
	Employed 7-10 years	5.9	2.934	0.044	364.981	1.162	114649.767
	Employed 10+ years	2.012	1.515	0.184	7.475	0.384	145.459
	Constant	-4.911	1.556	0.002	0.007		
Reflect on actions	Skills of employees in information	0.961	0.558	0.085	2.614	0.876	7.797
	Organisational goals and strategy	1.291	0.715	0.071	3.637	0.896	14.765
	Knowledge sharing	1.9	0.926	0.04	6.684	1.089	41.005
	Constant	-1.398	0.805	0.082	0.247		

Binary Logistic Regression models indicated that *Access to resources* was a significant predictor of whether participants work alone or with others to develop solutions to problems. *Organisational goals and strategy* and *Knowledge sharing* were part of the significant predictor model but did not significantly predict working alone or with other to develop solutions to problems independently [Chi-Square=19.36, df=6, p=.004]. *Training and learning* and *skills of employees* were not significant predictors. The model correctly predicted 87% of cases where they either worked alone or with others to develop solutions to problems or did not participate in that activity. The odds ratio indicated that the access to resources are over twice as likely to predict

201

whether employees are likely to work alone or with others to find solutions to problems or not. Employees are nearly twice as likely to work alone or with others to develop solutions to problems when there is an organisational strategy and goals present and twice as likely when they demonstrate knowledge sharing.

Access to resources was a significant predictor of whether participants work with others to create new ideas [Chi-Square=4.325, df=1, p=.038]. *Skills of employees,* T*raining and learning* and *organisational strategy and goals* and *knowledge sharing* were not significant predictors. The model correctly predicted 82.9% of cases where they either work with others to create new ideas or did not participate in that activity. Participants were nearly four times more likely to work with other to create new ideas if they had access to resources.

Skills of employees and *knowledge sharing* were significant predictors of whether participants acquire new information [Chi-Square=19.3, df=6, p=.004]. *Training and learning, organisational goals and strategy* and *access to resources* were not significant predictors. The model correctly predicted 87% of cases where employees acquired new information or not. The odds ratio indicated that the skills of employees were over twice as likely to predict whether employees acquire new information. Additionally, employees were nearly twice as likely to do so when they shared knowledge. Those aged 16-34 were over 30 times more likely to acquire new information. Those aged 35-44 were over 60 times more likely to acquire new information.

Training and learning was a significant predictor of whether participants asked for advice [Chi-Square=18.328, df=4, p=.001]. *Skills of employees,* access to resources and *organisational strategy and goals,* and *knowledge sharing* were not significant predictors. The model correctly predicted 76.2% of cases where employees asked for advice or not. Participants are nearly four times more likely to ask for advice if training and learning were part of their work. Those aged 16-34 and 35-44 were over 3.5 times more likely to ask for advice compared to other age groups.

Knowledge sharing was a significant predictor of whether participants followed developments in their field [Chi-Square=13.076, df=2, p=.001]. *Skills of*

employees, Training and learning, organisational goals and strategy and, *access to resources* were not significant predictors. The model correctly predicted 82.6% of cases where employees followed developments in their field or not. The odds ratio indicated that employees who knowledge share were nearly seven times more likely to follow developments in their field. Leaders and managers were over ten times more likely to follow developments in their field compared to non-managerial employees.

Skills of employees was a significant predictor of whether participants used self-study materials [Chi-Square=18.938, df=5, p=.002]. *Knowledge sharing, training and learning, organisational goals and strategy* and, *access to resources* were not significant predictors. The model correctly predicted 89.2% of cases where employees used self-study materials or not. The odds ratio indicated that employees were nearly seven times more likely to use self-study materials if they have information skills in the workplace. Participants were ten more likely to use self-study materials if they had been employed in the organismal for either 1-6 or 7-10 years. This was lower for those employees for 10+ years where they are seven times more likely to use self-study materials.

Organisational goals and strategy was a significant predictor of whether participants received feedback [Chi-Square=18.423, df=4, p=.001]. *Skills of employees*, *knowledge sharing, training and learning, organisational goals and strategy* and *access to resources* were not significant predictors. The model correctly predicted 93.5% of cases where employees received feedback or not. The odds ratio indicated that employees are over twelve times more likely to receive feedback if there were organisational strategies and goals in place. Participants were employed for either 1-6 years or 7-10 years were more likely to receive feedback form others compared to those employed in the organisation for 10+ years.

Knowledge sharing was a significant predictor of whether participants reflect on actions. *Skills of employees* and organisational goals and strategy were near significance but did not predict the reflection of actions individually [Chi-Square=16.509, df=3, p=.001]. *Training and learning* and *access to resources* were not significant predictors. The model correctly predicted 86.7% of cases where employees acquired new information or not. The odds ratio indicated that

employees were over twice as likely to reflect on actions if they had skills to do so and also over three times as likely to reflect on actions if there is an organisational strategy and goals in place. Additionally, employees who knowledge share were over six times more likely to reflect on actions.

A summary of the contribution of the six factors to the participation in the learning and innovation activities is presented in Table 30 below.

Table 30: Summary of factors that predict the participation in learning and innovation activities

Factors	Learning and Innovation Activities							
	Working with others to develop new ideas	**Working alone or with others to develop solutions to problems**	**Receiving feedback on tasks from work colleagues**	**Asking colleagues for advice**	**Following new developments in your field**	**Using self-study materials**	**Acquiring new information (e.g. by searching the internet or company knowledge base)**	**Reflecting on previous actions**
Skills	X					X	X	
Training and learning				X				
Access to resources	X							
Organisational goals and strategy			X					
Knowledge sharing					X			X

The Binary Logistic Regression analysis revealed that several factors contribute to eight of twelve learning and innovation activities in the workplace (see Table 30). Skills of employees predicted participation in the highest amount of activities including working alone or with others to develop solutions to problems, using self-study materials and acquiring new information. All of these activities relate to the creation and implementation of ideas in the workplace where employees may require a high set of skills in information use to do so. Knowledge sharing predicted the use of self-study materials and reflecting on actions, both activities of which require knowledge sharing (either with others or between sources) to do so. Training and learning only predicted whether employees asked for help. It could be that employees ask for help when they are unsure of tasks or information when training has been offered to them to do so. Having access to resources predicted whether employees work with others to create new ideas. This could indicate that employees use, or may require, the resources when working collaboratively. Finally, the strategy and goals of the organisation predicted whether employees receive feedback. It could be that a strategy to support feedback may encourage employees of a leadership and management capacity, for example, to give feedback to others on tasks.

7.3.1.3 Reliability testing of the factor analysis output

The results of the factor analysis demonstrated that there are five factors that contribute to the development of innovative work behaviour activities. Following this analysis, and to allow for comparison with data from the Scottish and Finnish case studies, further analyses were undertaken to determine the reliability of the factors created from the reduction of the original variables.

The procedure was identical to that of the Scottish case study. For each set of variables (i.e. those that make up the six factors from the Scottish Case study), Cronbach's alpha test was carried out (Field, 2009). Cronbach's alpha is a test of reliability and consistency of a set of variables that are suggested to measure the same concept. The purpose of this test was to measure the internal consistency of the variables (i.e. how closely related they are).

The results of the reliability testing were then used to create a new overall variable to reflect each factor of the Scottish Case study factor analysis. Once created, one sample t-tests were carried to explore whether the responses from

participants differed from the neutral option in the questionnaire responses. This t-test analyses used the value of 4 as the comparison value as participants were asked to indicate this value if they felt the importance of the factor to the development of innovative work behaviour was neutral (i.e. neither high or low importance).

The results of each of the statistical tests are explained in the sections that follow.

7.3.1.4 Results of reliability testing

The results of the Cronbach's alpha test for all factors is presented in Table 31 below.

Table 31: Cronbach's alpha statistics for all six factors

Factors	Cronbach's alpha (α)
Skills	.931
Knowledge sharing	.905
Training and learning	.882
Access to resources	.847
Organisational goals and strategy	.783

As with the Scottish case study, the results of Cronbach's alpha revealed high internal consistence for all variables used to create factors (see Table 31).

One sample t-tests revealed that there was a significant difference between the ratings of individual skills relevant to information behaviour as important to the development of innovative work behaviour compared to that of the neutral score of 4. Participants rated individual skills relevant to information behaviour significantly more important to the development of innovative work behaviour than the neutral level (with a mean score of 5.8, p<.05).

There was a significant difference between the ratings of knowledge sharing important to the development of innovative work behaviour compared to that of the neutral score of 4. Participants rated knowledge sharing significantly more important to the development of innovative work behaviour than the neutral level (with a mean score of 5.8, p<.05).

One sample t-tests revealed that there was a significant difference between the ratings of training and learning important to the development of innovative work behaviour compared to that of the neutral score of 4. Participants rated training and learning relevant to information behaviour significantly more important to the development of innovative work behaviour than the neutral level (with a mean score of 6.1, $p<.05$).

There was also a significant difference between the ratings of training and learning important to the development of innovative work behaviour compared to that of the neutral score of 4. Participants rated training and learning relevant to information behaviour significantly more important to the development of innovative work behaviour than the neutral level (with a mean score of 5.6, $p<.05$).

One sample t-tests revealed that there was a significant difference between the ratings of organisational goals and strategy important to the development of innovative work behaviour compared to that of the neutral score of 4. Participants rated organisational goals and strategy relevant to information behaviour significantly more important to the development of innovative work behaviour than the neutral level (with a mean score of 5.9, $p<.05$).

7.4 Chapter conclusion

The findings presented in this chapter have evidenced the contribution of information behaviours, organisational culture (including leadership) and skills and abilities of employees to the development of innovative work behaviour through workplace learning. This evidence was provided through the analysis of interview data from twelve participants employed within an English NHS Trust. Evidence is also presented as to the interrelations between themes and the contribution of multiple themes to the four main innovative work behaviour processes (recognition of innovation need, creation of ideas, championing of ideas and implementation of ideas). The contribution of each theme to the innovative work behaviour processes are shown in Table 32 below.

Table 32: Contribution of each theme to each innovative work behaviour process

Innovative work behaviour processes (West & Farr, 1990)	Contributing factors to innovation (themes from participant responses)						
	Information interpretation	Information and knowledge sharing	Information source	Culture	Skills and abilities of employees	Access to resources	Training and learning
Recognise the need to innovate	X				X		
Create idea		X		X	X	X	X
Champion idea		X	X	X	X		X
Implement idea		X		X			

A summary of the contribution of each theme to the development of each innovative work behaviour process (West & Farr, 1990) is presented in Table 32. Information and knowledge sharing, the culture of the organisational and skills and abilities of employees are the three main contributing factors to the development of innovative work behaviour. However, participants also noted that within the organisational culture, leaders (and leadership) play an important role in innovative work behaviour development to promote and engage the culture within the organisation.

The participants said that information behaviours were important for innovative work behaviour development. Information interpretation contributes to the recognition of the need to innovate and was an initiator of innovative work behaviour from the experiences discussed by participants. Additionally, information sources are important for employees when innovating at work. For example, 'people' as an information source help to share ideas and act as a vital information source when expertise in a certain topic area is needed to innovate. These findings were reflected in the findings from the analysis of questionnaire data which indicated that skills in information help employees to work with others to develop new ideas. However, recognition as to the amount of information was acknowledged by participants. The information overload can lead to the early termination of innovative work behaviour, or the lack of idea creation if employees are not able to process the information they are given.

In addition, as with the results from the analysis of the qualitative interviews, knowledge sharing influences the development of innovative work behaviour as noted in the findings of the questionnaire. The questionnaire results suggest that knowledge sharing predicts whether employees follow developments in the field and also reflect on actions which are activities. The analysis of interview data suggests that knowledge sharing helps during the creation and championing of ideas.

The participants viewed organisational culture as important to foster idea creation. However, the culture must be open to employees taking risks and must also be receptive to change. Although culture was not a direct predictor of the leaning and innovation activities in the analysis of the questionnaire data,

factors related to culture (e.g. the organisational strategy and goals) predicted participation in such activities and is therefore important.

Skills and abilities of employees predicts whether employees work alone or with others to develop solutions to problems, use self-study materials and also acquire new information. These activities are key when creating new ideas and implementing ideas in the workplace. The findings from the interview analysis suggests that communication and engagement are key skills and abilities in the development of innovative work behaviour. These skills are used when employees create new ideas in the workplace, which could include the activities noted above. The participants of the interviews indicate that skills and abilities enhanced innovative work behaviour, but these were categorised into two types: skills that contribute to the interaction and knowledge sharing processes and, skills that are specific to individual employees.

Unlike the results of the interview data analysis, training and learning predicts whether employees ask colleagues for advice. Noted in the interviews was the importance of people as an information source. It could be that training and learning in this area may encourage employees to seek advice form colleagues and knowledge share as a consequence (i.e. to develop new knowledge for the creation of new idea). Additionally, the results of the quantitative questionnaire revealed that the organisation may play a role in employee innovative work behaviour development. For example, access to resources (e.g. collaborative spaces to work) predicts whether employees work with others to develop new ideas. However, if this space is not provided then these employee behaviours may be hindered. Finally, the organisational goals and strategy predict whether employees receive feedback on tasks from work colleagues. This could relate to the organisational culture discussed by interview participants in that if the provision of feedback is promoted by leadership as part of the culture, this may then encourage employees to respond to the feedback given and make improvements.

Discussions during interviews focused highly on the social and interaction processes that take place within the NHS Trust. These processes are important in all elements of innovative work behaviour. Practicalities such as training and

access to resources were discussed less frequently during interviews. These factors are prominent within the quantitative questionnaire data analysis.

It is evident from the interview data discussed here that the central focus of innovation within the NHS Trust is that relevant to the development of products, processes and procedures (De Vries et al., 2015) and this was highlighted within the multiple examples that participants gave in how they make attempts to improve the processes and procedures of the departments they are in, or create an idea to help patients within the departments.

The overarching organisational innovation (i.e. improvements to the business structures and practices) is at the heart of idea creation of this NHS Trust yet the lower level innovative focus of behaviour of employees remains that of the internal processes and procedures. However, in depth discussions of the championing and implementation process of innovative work behaviour suggests that there is knowledge as to the importance of these stages to implement ideas in the workplace. The NHS Trust has implemented various strategies to improve innovation with the Trust and the influence of some of these strategies was evidenced by some participants who had used the services provided by the Trust in their own innovative work behaviour.

Chapter 8: Discussion

8.1 Introduction

The findings presented in this thesis report on the factors that enhance and inhibit innovative work behaviour through workplace learning. In addition, examples of determinants (i.e. signals or indicators) of successful innovative work behaviour development through workplace learning are reported.

The findings reported in Chapters 5, 6 and 7 are discussed in this chapter in respect of the role of information literacy, information behaviours and contextual factors in the development of innovative work behaviour. The research questions posed in this research were:

RQ1: How does information literacy (including the associated information behaviours) support successful workplace learning as related to the development of innovative work behaviour?

RQ2: How do contextual factors support innovative work behaviour for application at individual and collective levels in the workplace?

RQ3: What are the determinants (i.e. signals or indicators) of successful workplace learning for innovative work behaviour?

Table 33: A summary of the main findings of the Scottish, Finnish and English case studies

Factor	Scottish university	Finnish University	English NHS Trust
Information literacy	X	X	
Specific information behaviours	X	X	X
Organisational culture	X	X	X
Leaders and leadership	X	X	X
Training and learning	X	X	
Access to resources (findings from the quantitative questionnaire only)	X	X	X
Skills and abilities of employees	X	X	X

There are seven factors that enhance or inhibit innovative work behaviour development (See Table 33 on page 213). Out of the seven factors, information behaviours, organisational culture, leadership and, skills and abilities of employees are most important. This is because these four factors were discussed by detail by the participants of all three case studies and the remaining factors were not. The factors map to the three categories factors that influence behaviour development in Social Cognitive Theory (See Chapter 3, section 3.1.1 on page 71). In this study these are:

1. **Behavioural factors** (i.e. factors that relate to the behaviours of themselves or other people) - leaders and leadership;
2. **Environmental factors** (i.e. factors within the employees' environment which can impact behaviour) - organisational culture, training and learning and, access to resources and;
3. **Cognitive factors** (i.e. factors relate to the internal thought processes of people) - information literacy, skills and abilities of employees.

It is highlighted in section 3.1.1. on page 71 of this chapter, that there is some overlap in the categorisation of the factors as relevant to the behavioural, environmental and, cognitive factors in SCT.

Regarding research question 1: 'How do contextual factors support innovative work behaviour for application at individual and collective levels in the workplace?', the discussion draws upon the findings in all three case studies in respect of the contribution of information literacy and specific information behaviours in the development of innovative work behaviour (see section 8.2 on page 215 and section 8.3 on page 219). Data were gathered from interviews, focus groups and a questionnaire as part of the largest Scottish case study as well as interviews and questionnaires in the smaller Finnish and English case studies.

The same process is used to answer research question 2: 'How do contextual factors support innovative work behaviour for application at individual and collective levels in the workplace?'. Here, the focus is on contextual factors (e.g. leadership, organisational culture and, skills and abilities of employees) that enhance and inhibit innovative work behaviour (see section 8.4 starting on page 225 of this chapter).

Regarding the final research question: 'What are the determinants (i.e. signals or indicators) of successful workplace learning for innovative work behaviour?', the discussion draws upon the examples of good practice in innovative work behaviour development through workplace learning as discussed by the participants of this research.

Following this, a discussion of how the findings of this research can be used to extend Social Cognitive Theory (see section 8.7 starting on page 241). The focus here is of the contribution of the use of SCT in information science of research on innovative work behaviour. In addition, the extension of the main concepts of SCT are discussed.

Finally, future research from this work is discussed before a chapter conclusion is given.

8.2 Information literacy, workplace learning and innovative work behaviour

The first research question is concerned with the information related factors that enhance and inhibit innovative work behaviour (e.g. information literacy and information behaviour). In short, the discussion below highlights the information related factors that enhance and inhibit innovative work behaviour and discusses the relevance of the findings to the literature reported in Chapter 2 of this thesis. This includes the discussion of where the findings of this study do and do not align with prior literature to highlight the theoretical contribution of this work.

The participants in two of the three case studies suggested that information literacy supports innovative work behaviour development through workplace learning. To answer part of research question 1 'How does information literacy (including information behaviours) support successful workplace learning as related to the development of innovative work behaviour?' the section that follows explores the contribution of information literacy to workplace learning, and then the contribution of information literacy to the workplace learning of innovative work behaviour.

It is acknowledged that some information behaviour are elements of information literacy (e.g. information analysis and interpretation). However, in this research,

information literacy and information behaviours are treated separately. This is because the purpose of the research was to explore the specific impact of information literacy and information behaviours on innovative work behaviour development.

8.2.1 Information literacy as a factor that enhances workplace learning

The findings of the research reported in this thesis suggest that information literacy is important for workplace learning. This finding was reported by the participants of the Scottish and Finnish case studies (see section 5.3.1 on page 134 and, section 6.3.1 on page 166) but not of the English case study. The participants of the Scottish case study explained that information literacy is important for workplace learning when employees are required to acquire or learn new knowledge to apply it to the workplace (see section 5.3.1 on page 134). In this way, the participants of the Finnish case study explained that information literacy also helps to give context to learning and help employees understand the content that needs to be learned (see section 6.3.1 on page 166).

The findings reported in this thesis align with literature which suggests that information literacy is context dependent and embedded into practice (see Lloyd, 2010, 2012 in section 2.4.1.1 on page 27). This is because the findings of this research imply that information literacy may not be recognised as a separate factor by the participants of the English case study as it is embedded into their workplace practices.

In addition, the findings are in line with studies that suggest that information literacy supports the transformation and application of information and knowledge in the workplace (e.g. Crawford & Irving, 2009; Williams et al., 2014 in Chapter 2, section 2.4.1.1 on page 27). This means that the knowledge acquired from information literacy is then used in workplace learning.

The empirical work conducted for this study, reported in the preceding chapters, indicates that information literacy enhances workplace learning. Although it does so through the acquisition of knowledge to apply to workplace learning, the information literacy element is context dependent (as evidenced by the reporting of information literacy from the participants of only two of the three

case studies). This means that information literacy practices vary in different workplace learning contexts, particularly with reference to workplace learning. Some workplace practices (e.g. in healthcare settings) may have alternative learning mechanisms in place to help employees to learn as employers know the importance of correctly learning in the workplace (e.g. correct procedure and polices). This means that information literacy may be embedded into practice and my not be recognised as a specific factor in this context. The impact a lack of learning in healthcare settings may be greater on service users than that in educational settings (e.g. mistakes could have serious consequences for the health of service users). In these instances, employees need to be information literate but this is embedded in workplace leaning and the context so it is not always an obvious factor for the participants to discuss.

It is therefore important to explore the influence of information literacy on workplace learning in *specific* workplace practices (e.g. the learning required or tasks and, activities employees participate in).

8.2.2 Information literacy as a factor that enhances innovative work behaviour through workplace learning

The findings of the research reported in this thesis suggest that information literacy is important for workplace learning of innovative work behaviour. This finding was reported by the participants of the Scottish and Finnish case study (see 5.3.1 on page 133 and, section 6.3.1 on page 166) but not of the English case study. This means that information literacy is context dependent (i.e. information literacy may not be obvious to employees of all workplace contexts), even when it contributes to innovative work behaviour development.

The findings reported in this thesis show that information literacy is an initiator of innovative work behaviour. This finding was noted by the participants of the Scottish case study (see Chapter 5, section 5.3.1 on page 133). The participants of the Finnish case study suggested that information literacy helps to give context to learning and helps to establish background information so that employees are aware of possible future requirements for change (e.g. in the creation of new ideas). (see section 6.3.1 on page 166).

As discussed by the participants in the Scottish and Finish case studies, information literacy helps employees to identify gaps in knowledge needed to

create new ideas in the workplace (See section 5.3.1 on page 133). Once the gaps in knowledge are identified, information literacy helps employees to choose the most appropriate information behaviours to carry out. For example, information literacy helps employees to share information needs and requests and, the sharing of requests prompts employees to create new ideas or take new approaches to work (see the findings of the Scottish case study in section 5.3.1 on page 133).

The collective nature of information literacy was also identified by the participants of the Finnish case study (see section 6.3.1 on page 166). This means that information literacy is relevant to both individual employees and collectively in groups of employees to help them to innovate.

The findings align with the literature which suggests that information literacy is context dependent (see section 2.4.1.1 on page 28). However work carried out by Lloyd (2010, 2012) focuses on learning in the workplace specifically as opposed to the application of workplace learning in the development of innovative work behaviour. The findings of the empirical work undertaken in this research therefore extends the work of Lloyd (2010, 2012) in the creation of knowledge on the application of workplace learning across different workplace contexts.

The findings of this study also extend the literature reported in chapter 2 of this thesis which suggests that information literacy helps employees to transform knowledge into learning in the workplace (e.g. Crawford & Irving, 2009; Williams et al., 2014 as noted in section 2.4.1 on page 28). The findings of this research do indeed demonstrate that information literacy is important to enhance the knowledge sharing processes in the workplace. However, they extend current of knowledge on how the knowledge sharing is applied to the creation of new ideas. This means that knowledge sharing is important to help employees to acquire knowledge, but it is then important that employees use the acquired knowledge to create new ideas in the workplace.

The findings of the research reported in this thesis differ from that noted in the literature above for several reasons. For example, some of the prior work (e.g. Lloyd, 2012; Williams et al.,2014) review findings of previous studies to draw conclusions on different information literacy practices. In doing so, comparisons

are made across multiple workplace contexts in different research studies. Here, it is acknowledged that information literacy is context dependent. However, the research methodologies differ during empirical work of different research studies (as noted in section 2.4.1.5 on page 40 of the literature review in this thesis). The findings of the empirical work reported in this thesis differ as three different workplace contexts were explored as part of one larger study. As the methods used to collect data are identical across the three case studies reported in this thesis, the contextual differences in information literacy practices can be explained by the differences in the workplace context as opposed to any difference in methods used to collect data. It is not possible to do so in research where no empirical work is collected, and the conclusions are drawn from reviews of literature.

8.3 Specific information behaviours as factors that enhance innovative work behaviour

The discussion below highlights the information behaviours that enhance and inhibit innovative work behaviour. Provided in this section is a discussion of the relevance of the findings to the literature reported in Chapter 2. This includes a discussion of where the findings of this study do and do not align with prior literature to highlight the theoretical contribution of this work. It is important to note here that the literature detailed in Chapter 2 is not separated into specific information behaviours. The reason for this is that the research was exploratory and an aim of the research was to identify the emergence of specific information behaviours from the findings of this research. Therefore this section of the discussion is set out to identify the information behaviours that did merge and discuss the information behaviours and draws comparisons in respect of the specific studies identified in Chapter 2 (see section 2.4.1.2 on page 29).

The participants in all three case studies suggested that specific information behaviours enhance and inhibit innovative work behaviour development. These are: information needs recognition (see section 8.3.1 on page 220), information seeking (see section 8.3.2 on page 221), information interpretation and analysis (see section 8.3.3 on page 222) and, information and knowledge sharing (see section 8.3.4 on page 223).

8.3.1 Information needs recognition

The participants in the Scottish case study suggested that information behaviours are influenced by the information needs recognition of employees in the workplace before innovative work behaviour can take place (see section 5.3.2 on page 135). They explained that information needs recognition is required to identify types of information needed to then decide which information behaviours to exhibit. The information needs recognition dictates the means by which employees seek to fill the gap in information or knowledge (i.e. information behaviours to exhibit). In this study, only participants of the Scottish case study highlighted that information needs recognition is a prerequisite to innovative work behaviour.

Although previous work has identified the need for information process flows and information systems for successful innovation in the workplace (e.g. Baker & Freeland, 1972; Mustonen-Ollila & Lyytine, 2003), much of this work has focused on the collective flow of information in the workplace as opposed to the role of information need recognition for individual behaviour studies in this research. This difference explains why the participants of this study were able to identify the contribution of information needs recognition to innovative work behaviour specifically.

The findings of this research extend prior work by suggesting that information needs recognition is an initiator of the information behaviour that enhance innovative work behaviour (i.e. the need for employees to recognise the kind of information needed and actions required to use the information successfully). These specific behaviours are discussed in further detail in the section that follow.

8.3.1.1 Information overload

The analysis of data also revealed some information related concerns form participants. The participants of the Finnish and English case study identified information overload as an inhibitor of innovative work behaviour (see section 6.3.1 on page 166 and section 7.2.1 on page 189). This means that there is a potentially negative impact of information overload on innovation and innovative work behaviour. The findings of this work suggest that information overload increases the possibly that employees miss information important to innovation

as employees do not have the capacity to read and utilise all information they are exposed to.

As noted in the literature in section 2.4.1.4 on page 29, information overload hinders innovation (e.g. Cleverley et al., 2017; Desouza et al, 2008; Herbig & Kramer, 1994). The findings of this study align with this prior literature. Desouza et al. (2008, p.41) identified information overload as a specific challenge during the idea generation and development phases of innovation as did the study discussed in this thesis. However, it is important to note that prior work (e.g. Desouza et al, 2008) focuses on customer-driven innovation as opposed to employee-led innovation. It is therefore difficult to make direct comparisons between the two studies. In addition, Cleverley et al. (2017) suggests that information overload impacts task performance in the workplace. Overload is likely to occur with increased time pressure and vast amounts of diverse information where employees are unable to process the information quickly or efficiently enough (Cleverley et al., 2017, p.77).

In this respect, the findings of the research reported in this thesis extend the prior literature in the application of similar information problems (i.e. information overload) in multiple workplace contexts.

8.3.2 Information seeking

Information seeking is inhibited by complex structures in the workplace, and this hinders innovative work behaviour development. This was evidenced form discussion with the Finnish case study participants who gave examples of the difficulty of information seeking due to complex structure information sources (see section 6.3.1 on page 166).

In addition, the participants in all three case studies identified people as an important information source due to the ability to seek information more quickly and question the meaning of the information sought (see section 5.3.2 on page 136). This means that the findings highlight the social nature of information seeking. The participants in the Scottish case study discussed the benefits of information searching when colleagues are used as a source of advice (information) to discuss the plausibility of ideas during the idea creation phases of innovative work behaviour (see section 5.3.2 on page 136-137).

The findings reported in this thesis emphasise the importance of useful and easy navigable information sources when employees are searching for information in the workplace. These findings are in line with research by Conole et al. (2008) who identify the need for easily accessible information sources in the innovative performance of organisation. However, the findings of this research extend the current literature by allowing the importance of information seeking in innovative work behaviour to emerge from the discussions with the participants as opposed to the collective innovation processes studied by Conole et al. (2008).

8.3.3 Information interpretation and analysis

The interpretation and analysis of information are important in innovative work behaviour development as noted in the findings from all three case studies. It is recognised here that information interpretation and analysis are also elements of information literacy. The participants of the English case study did not discuss information literacy specifically, which indicates that information literacy in general, is embedded into practice. In contrast, the participants of the English case study did discuss information interpretation and analysis as a contributing factor to innovative work behaviour development as noted below.

The findings of this research indicate that information interpretation acts as an initiator of idea creation because it helps employees to recognise the creation of ideas is needed (i.e. where the information gap is). These findings were noted by the participants of the English case study (see section 7.2.1 on page 189). In addition, the analysis of information then helps employees to make sense of information before employees are able to use the information to learn. The participants of the Finnish case study explained that this learning occurs through making sense of the information through the interpretation where context and meaning is added before information is applied to innovation (see section 6.3.2 on page 168).

The findings of this study align with early work which highlight the importance of information interpretation in the knowledge acquisition process (e.g. Nambisan et al., 1999 in section 2.4.3.1 on page 32). These studies emphasis the interpretation of information in order to apply the knowledge to the given task.

Other studies have demonstrated the positive impact of information interpretation and analysis on firm performance (e.g. Jiménez-Jiménez & Sanz-Valle, 2011; Tippins & Sohi, 2003 in section 2.4.1.2 on page 31). Although the findings from this study do align with the findings of this work in terms of improved performance, the focus of work by Jiménez-Jiménez & Sanz-Valle (2011) and Tippins and Sohi (2003) centre around collective information interpretation (the sharing information interpretation) and the impact on collective performance as opposed to the performance of individual employees in this study. It is therefore difficult to make direct comparisons, but acknowledge that the differences between the impacts on collective performance in the literature as opposed to the individual employee performance studied in this work. The findings of this research extend prior research noted above to explain the contribution of information interpretation to employee-led innovation (specifically idea creation in innovative work behaviour) as opposed to collective innovation.

8.3.4 Information and knowledge sharing (including people as an information source)

The findings of this research demonstrate that information and knowledge sharing enhance innovative work behaviour. The participants of the Scottish and Finnish case studies emphasised the need to share knowledge to adapt the way employees work (i.e. through the sharing of practice). This helps to transfer knowledge through the organisation (see section 5.3.2 on page 133 and section 6.3.2 on page 166). The participants of the English case study identified that information and knowledge sharing was vital in order to champion and implement ideas. This was with reference to the sharing of information as to the support available for employees to implement ideas within the NHS Trust (see section 7.2.1 on page 189). It was noted here that information and knowledge sharing is only useful if the recipients apply the information and knowledge to workplace tasks. The findings of the quantitative questionnaire analysis demonstrated that knowledge sharing predicts whether the participants worked alone or with others to find solutions to problems (see section 5.4.1.2 of the Scottish case study on page 144) as well as whether the participants acquired new information and followed developments in their field (see section 7.3.1.2 on page 200 of the English case study).

The findings of this research align with literature in Chapter 2 which suggests that CoPs support innovation (e.g. Soekijad et al., 2004 in section 2.4.1.4 on page 34). Evidence was provided from two of the case study organisations as to the formation of a wider Community of Practice within the organisation (Wenger, 1998). Like many NHS Trusts in England, the Trust studied in the research was part of a larger innovation network which provided a service to enhance innovation, share practices, common problems and collaborate to find solutions to the problems (a common element of a Community of Practice as noted by Pattinson & Preece, 2014, p.113-114). As with the findings of the English case study the CoPs facilitated knowledge sharing, the generation of new ideas and diffusion (championing and implementation) of such ideas (e.g. Brown & Duguid, 1991; Coakes & Clark, 2005; Cross et al., 2001; Wenger & Snyder, 2000; Wenger et al., 2002 discussed on page 35 of section 2.4.1.4 in Chapter 2). However, it is evident from comparison of the findings that the development of such communities of context dependent and that some organisational contexts (e.g. an NHS Trust) may purposefully facilitate the development of the communities as opposed to the natural formation of the groups. In this respect, the findings of this do not agree with suggestions made that CoPs are naturally formed and are not easily cultivated (e.g. Boud and Middleton, 2002). The findings here extend the work on CoPs to suggest that CoPs can be cultivated if the group members have a common goal that needs addressing. The findings of this work differ from prior work due to the methodology used. The discussions of CoPs were a product of the discussions around the enhancement of innovative work behaviour as opposed to the direct exploration of the CoPs that formed in these case studies.

The findings of this research aligns with prior research reported in Chapter 2 which suggests that knowledge is a resource which benefits employees when exchanged (e.g. Bock & Kim, 2002; Cabrera & Cabrera, 2005; Wu, Lin & Lin, 2006) Here, resources are exchanged between actors who share social bonds, operate within long-term co-dependent relationships and display high levels of trust (Hall, 2003, p.290-291). The actors in this research are the employees that share knowledge. They share knowledge for the benefits of learning and application of this knowledge to their work. The findings of this research also align with prior work reported in chapter 2 that employees share knowledge to

achieve workplace outcomes (e.g. Chiu et al. 2006) and that the sharing contributes to organisational performance (e.g. Kim, 2002) from leveraging the expertise in the organisation (Du Plessis, 2007; Ellinger & Cseh, 2007).

The work reported in this thesis extends current knowledge on how knowledge sharing enhances innovation. Despite the large body of evidence to suggest that knowledge sharing is important for employee-led innovation (See section 2.4.1.3 and 2.4.1.4 starting on page 31) prior work has not explored the contribution of knowledge sharing to the specific stages of innovative work behaviour (i.e. idea creation, championing and implementation).

8.4 Contextual factors that enhance innovative work behaviours

The second research question is concerned with the contextual factors that enhance and inhibit innovative work behaviour.

In short, the discussion below highlights the contextual factors that enhance and inhibit innovative work behaviour and provides discussion as to the relevance of the findings to the literature reported in Chapter 2 of this thesis. This includes discussion of where the findings of this study do and do not align with prior literature to highlight the theoretical contribution of this work.

The participants all three case studies suggested that four main contextual factors contribute to innovative work behaviour development. These are:

(1) culture (discussed in section 8.4.1 on page 226),

(2) leadership (discussed in section 8.4.2 on page 230),

(3) Training (discussed in section 8.4.3 on page 232),

(4) Access to resources (discussed in section 8.4.4 on page 236).

To answer research question 2: 'How do contextual factors support innovative work behaviour for application at individual and collective levels in the workplace?', the specific elements of the organisational culture and leadership are discussed in further detail (in separate sub-sections).

8.4.1 Organisational culture

Four main characteristics of organisational culture are discussed in this section. These are:

1. The organisational culture in general
2. Culture related to the organisational strategy
3. Culture to support knowledge exchange and;
4. The view towards risk and change as part of the culture.

8.4.1.1 Organisational culture in general

The findings from the analysis of all case study data indicates that organisational culture is important in the enhancement of innovative work behaviour. These findings were presented for all case studies in Chapters 5 to 7. The participants of the Scottish case study suggested that, in general, the culture promotes innovation to encourage employees to create new ideas (See section 5.3.3 on page 138). This was also the case for the participants in the English case study (See section 7.2.2 on page 191). In addition, the culture helps employees to cope with change (as noted by the participants of the Scottish and Finnish case studies)

There has been an abundance of work to demonstrate that organisational culture fosters innovation in the workplace (e.g. Damanpour, 2006; Forhamn, 1998; Harbi et al.,2014; James, 2005; Martins & Martins, 2002; Martins, 2003; Naranjo-Valencia et al., 2011; Wei et al., 2012 as reported in section 2.4.2.2 starting on page 42). In general, the findings reported in this thesis align with this literature.

However, the focus of prior work has been on the influence of organisational culture on innovation on the organisational level and firm performance (e.g. Naranjo-Valencia et al., 2011; Wei et al.,2013) as opposed to innovation from employees in the workplace studied in this research (see section 2.3 on page 21 for definitions as relevant to collective and individual innovation).

Some prior work has begun to focus on innovation from individual employees (e.g. Shanker & Bhanugopan, 2014; Stoffers et al., 2015). However, the findings of the research reported in this thesis differ in respect of the identification of how culture supports innovation.

Although the findings of this research do align with other work (e.g. Shanker et al., 2017; Stoffers et al., 2015), the methodological approaches of the two studies differ. The study reported in this thesis used a multi method approach using qualitative and quantitative data collection whereas the studies noted above use quantitative data collection methods and analysis only. This means that the comparison of the studies can only be carried out in terms of the general patterns found (e.g. whether a factor influences innovative work behaviour), and not specific reasons for patterns. Stoffers et al. (2015) analysed data using correlation and this does not indicate a predictive relationship in factors explored whereas predictive relationships were explored in the use of binary logistic regression in this study. In addition, the measurement of innovative work behaviour in Stoffers et al. (2015) was carried out using a quantitative questionnaire whereas the study reported in this thesis used interview and focus group discussions (both to determine the definition and also the relationships with factors). In this respect, it is unknown as to whether the participants in the study by Stoffers et al. (2015) fully understood the concepts used in the work.

This means that the findings reported in this thesis extend knowledge of the specific contribution of organisational culture to innovative work behaviour on the employee level. In addition, knowledge has been created on how organisational culture enhances innovative work behaviour during the main stages (e.g. idea creation, idea championing and, idea implementation).

8.4.1.2 Organisational culture as related to the organisational strategy

The findings that emerged from interview and focus group discussions revealed that organisational culture is important. However, as noted by the participants of the Scottish and Finnish case studies, the culture only helps to improve innovative work behaviour if relevant to the strategy of the organisation (See section 5.3.3 on page 138 and section 6.3.3 on page 171). The expected behaviours of employees must be communicated to all employees through the organisational culture. These findings were reflected in the analysis of findings of the quantitative questionnaire. Participants in all three case studies rated organisational culture as an important factor in innovative work behaviour

development. In addition, organisational goals and strategy significantly predicted whether participants worked with others to develop new ideas and performed new tasks in the Scottish case study. The findings of the quantitative questionnaire help to triangulate the discussions reported by participants as part of the interview and focus group data collection.

The findings discussed above are in line with prior literature which suggests that culture and strategy are important to enhance innovation together e.g. (Naranjo-Valencia et al., 2011, p.56; Martins & Martins, 2002; Ramírez et al., 2011, p.250-251; Rude, 2014, p.130-131 as reported in section 2.4.2.2 on page 42).

The findings of the research reported in this thesis emphasise the contextual nature of organisational culture and the strategy in comparison with prior literature. For example, Naranjo-Valencia et al. (2011) sampled Spanish organisations as opposed to Scotland, Finland and England in this study. Therefore, the embedded culture could be different. The findings reported in this thesis provide evidence of similar patterns that occur in multiple workplace contexts (i.e. Finnish, English and Scottish organisational contexts studied in this research) in alignment with prior work in other workplace contexts (e.g. the Spanish organisational context studied by Naranjo-Valencia et al., 2011). Therefore, the findings of this research extend knowledge in suggesting that the culture may be specific to each organisation. However, regardless of context, the culture needs to be aligned with the strategy of the organisations to be successful (i.e. to promote the expected behaviours of employees as detailed in the strategies)

8.4.1.3 Organisational culture to support knowledge exchange in the workplace

The findings of this study demonstrate that organisational culture supports knowledge exchange in the workplace. This knowledge is then applied to innovation. The participants of the Finnish University case study emphasised that the organisational culture was there to support employees to bring new knowledge into the organisation (e.g. though networking externally) and use the knowledge to innovate (see section 6.3.3 on page 171). This knowledge exchange occurs as part of groups (referred to as CoPs).

The findings of this research align with the literature reported in Chapter 2 and suggests that organisational culture supports knowledge exchange and flow within the organisations (see section 2.4.2.2 on page 42). The culture of the organisation helps employees to use knowledge to develop innovative work behaviour (Harbi et al., 2014). The findings of this study are in line with work by Harbi et al. (2014) in suggesting that the communication between people and groups (as part of the organisational culture) reduces the disconnectedness of ideas created. As demonstrated in this study participants who communicated and exchanged knowledge with others felt that they had more support for the creation of new ideas as part of the culture of the organisation. The findings of this work also align with prior work which suggests that information and knowledge sharing across the organisation impacts how employees perceive the culture, and this can influence employee innovation (Ortega-Egea et al., 2014). The knowledge sharing is facilitated by those in the organisation who are seen to promote the culture (e.g. leaders or the leadership team) as also noted in the findings of this study (see section 2.4.3 on page 60).

8.4.1.4 The view towards risk and change as part of the organisational culture

The participants in the Scottish and English case studies explained that an important element of organisational culture was the organisational views towards risk and change. This means that views towards risk and change within the organisation may be contextual depending on the service offered. For example, participants of the English NHS case study suggested that the collective culture must be receptive and welcoming to change (see section 7.2.2 on page 192). This allows employees to take steps towards the implementation of new ideas in the workplace, even if the implementation does not fully go to plan. However, risk taking in the English case study was not encouraged due to the potential impacts on services and patients. A risk assessment procedure was in place to help to mitigate innovation related risks before the idea is implemented in the workplace (see section 7.2.2 on page 192)..

The discussions with the participants of the Scottish University case study highlighted the need for change to keep up with the changing ways in which processes and procedures are carried out (i.e. in the competitive market with

other universities). However, changes made within the university were small and often did not affect the wider community. As noted on page section 5.3.3 on page 138, the participants of the Scottish University case study also indicated that risk was welcomed in terms of creating and implementing new ideas (unlike the participants of the English case study).

The findings reported here align with literature that suggests that risk taking is vital to innovative work behaviour development (e.g. Shanker & Bhanugopan, 2014 reported in section 2.4.2.2. on page 42). A culture that promotes risk taking supports employees by recognising that there will be no consequences for failure (as in findings from the English NHS case study). Risk taking also allows employees to take ownership of their behaviours and provides employees with autonomy in their job roles, an element of employment known to enhance innovative work behaviour (see Shanker et al., 2017). This was demonstrated specifically in the Scottish University case study were employees were encouraged to change processes and procedures they use in the workplace. Education as to the consequences of risk can improve innovation from employees (Knight et al., 2010). The findings of the study reported in this thesis are similar to this in suggesting that education and support surrounding risk taking (e.g. risk assessments identified with the English NHS case study) supports employees to manage risk as part of the whole innovative work behaviour process.

8.4.2 Leaders and leadership within the organisation

Leadership, and the role of leaders, was a key theme which emerged from the analysis of interview and focus group data as well as the analysis of the quantitative questionnaire. In all three case studies, participants discussed the support leaders provide as part of a leadership structure. Two areas were discussed by the participants. These were:

1. Leaders promote organisations culture and;
2. Leaders support employees to innovate.

8.4.2.1 Leaders promote the organisational culture

The participants of the Scottish University case study reported that leaders support employees to innovate by promoting the culture needed for innovative work behaviour. A key finding here is that leaders work in line with the business

strategy and business need to promote the behaviours required by employees across the organisation and communicate key messages to employees (See section 5.3.4 on page 141). The participants of the Finnish University case study reported that the promotion of culture from leaders makes non-leaders feel inspired as the actions of the leaders exemplify how they would like employees to behave (see section 6.3.4 on page 173).

These findings align with the prior literature reported in Chapter 2 which suggests that leaders help to promote the organisational strategy, which helps to shape the organisational culture to enhance innovation (e.g. Mumford et al., 2002; Naqshbandi et al., 2018; Rosing et al., 2011 reported in section 2.4.2.3 on page 45). More specifically, Northouse (2017) suggests that the main impact of leaders lies in the behaviours and actions they display to employees in the workplace. These behaviours from leaders act as a reinforcer of employee behaviour with the expectation that employees will imitate the behaviours of leaders (a suggestion made in Bandura's Social Learning and Imitation Theory, 1997). De Jong and Den Hartog (2007, p.49) also report this in respect of leaders exhibiting innovation related behaviours that they would like employees to carry out (e.g. exploring opportunities, generating ideas and, championing ideas). This finding was noted from the participants of the Finnish case study.

8.4.2.2 Leaders provide support for employees to innovate

The participants in this research discussed that leaders provide support for innovation in multiple ways. According to the Finnish case study participants, leaders provide reassurance and support for idea creation which helps to increase the confidence and autonomy of employees in doing so themselves (see section 6.3.4 on page 173). In addition, the participants of the Scottish case study explained that leaders support employees to cope with change and the fear of failure during the process of innovation (see section 5.3.4 on page 141).

The findings reported here are in line with the literature reported in section 2.4.2.3 on page 45 of Chapter 2. As noted in prior work, employees require leaders to take charge when creating ideas in the workplace (Elenkov & Manev, 2005). Employees then have the confidence to take ideas forward, only if they

are committed to doing so, an idea suggested within the literature (Martins & Martins, 2002; Sarros et al., 2008).

The findings of the study are also in line with work which suggests that leaders support employees to innovate by providing a degree of autonomy in their roles (Mumford et al., 2002). This autonomy comes from leaders who are more creative. Den Hartog (2007) notes that the process of providing feedback, and proving support for innovation (e.g. being patient and helpful, listening, looking out for someone's interests if problems arise) impact the processes of idea generation as well as idea application in the workplace. Given the appropriate support noted here, employees are more likely to generate ideas in the workplace and work to apply the ideas where possible (a finding in this study).

The findings reported in this thesis also align with the literature that suggest that leaders help to prepare employees for the impact of change (e.g. Elenkov & Manev, 2005; Franckeiss, 2012, reported in section 2.3.4.3 on page 45). Leaders help employees to cope with the processes of change involved in innovation by discussing how changes will affect employees and incorporating employees in the decision-making process (De Jong & Den Hartog, 2007, p.49). Prior work also suggests that investment in human capital in the workplace (i.e. employees) lessens the resistance to innovations (Zwick, 2002). This is done through clear communication and dialogue from leaders and to staff of all levels during the process of change (Franckeiss, 2012). The findings of this thesis suggest that this is the case. Employees are more likely to create and implement new ideas in the workplace if they understand the reason for change and the need to innovate.

8.4.3 Training and learning

The analysis of interview and focus groups data revealed that training for innovative work behaviour was not deemed important for innovative work behaviour development. Instead, participants discussed types of training relevant to the learning of specific skills and tasks in the workplace as opposed to innovative work behaviour. For example, participants of the Scottish University emphasised the support given for staff to complete formal qualifications and participants of the English NHS trust emphasised formal training required in the role development, even when prompted regarding

innovation. The participants of all three case studies rated training and learning as important in the questionnaire. In the Scottish case study, training predicted whether the Scottish case study participants used trial and error in tasks, receiving feedback and observed and replicate others completing tasks (see section 5.4.1.2 on page 151). In the Finnish case study, training predicted whether the participants asked colleagues for advice. It is unknown as to the influence of training on the specific innovative work behaviour stages.

The literature discussed in Chapter 2 indicates that training influences innovative work behaviour of employees (e.g. Bos-Nehles et al. 2017; Hall et al., 2019, Knol & van Linge, 2009; Lundkvist & Gustavsson, 2018, Messmann & Mulder, 2011; Pratoom & Savatsomboon, 2012, in section 2.4.2.5 on page 51). Success is achieved in respect of competency development programmes designed to improve workplace competencies associated with innovation by employees participating in learning and innovation activities (e.g. Lundkvist & Gustavsson, 2018). The qualitative findings reported in this thesis differ from the literature referred to here. The difference in findings could be due to the difficulty in assessing the direct impact of training on employee led innovation as noted by Hall et al. (2019). It may be that the participants in this study do participate in training related to skill development for innovation. However, the participants may not have felt such training was relevant to innovative work behaviour directly.

Given the prior work on training to enhance innovation (e.g. Bos-Nehles et al., 2017; Lundkvist & Gustavsson, 2018; Messmann & Mulder, 2011 in section 2.4.2.5 on page 52), it is not surprising that the analysis of the quantitative questionnaire revealed some relevant findings that were similar to the literature. As training is known to enhance competencies in relation to innovation (e.g. Lundkvist & Gustavsson, 2018), it is common that training and learning would predict whether participants observe or replicate colleagues' strategies to complete a task or solve problems. The strategies are easily learned in settings where observation and replication are common, such as in a training setting where an instructor and student or employee) are present (Bandura, 1986).

A key contribution of this study is the extension of knowledge of training for innovation. The literature discussed in this section emphasises the need for

training to improve skills and abilities of employees in respect of innovation. However, the findings of this study reveal that it may not be the specific training that supports innovative work behaviour development, but the participation of employees in activities related to learning and innovation (e.g. such as the ones assessed in the quantitative element of this study).This means that on a practical level, employees may wish to consider the type of activities employees participate in given that participants of this study and the literature suggest that there is often not enough time in the working day for innovation related training.

8.4.4 Access to resources in the workplace

Access to resources was not discussed by any participants of the three case studies. Instead, the contribution of access to resources to innovative work behaviour was highlighted in the findings of the Scottish case study (see section 5.4.1.2 on page 151) and the English case study (See section 7.3.1.2 on page 199). In these findings, access to resources determined whether the participants worked with others to create new ideas, performed new tasks and found solutions to problems. All activities noted here are relevant to innovative work behaviour (e.g. idea creation).

The literature discussed in Chapter 2 of this thesis also explains that resources are important for innovation. For example, the provision of digital tools and providing the physical space to encourage offline interactions is important to facilitate innovation (see section 2.4.2.4 on page 50). The findings of this study are not the same as in the literature noted above, but some similarities can be noted. The method used to analyse the findings of the quantitative questionnaires in the study reported in this thesis reduced a larger set of variables to five main factors. The 'access to resources' factor comprised elements of access to tools and technology as well as the provision of a collaborative space. However, in this research it was not possible to explore the individual contribution each variable made to innovative work behaviour development.

The findings of this research mean that, although access to resources (collectively) may not enhance innovative work behaviour (as noted in in the views of the interview and focus group participants), the individual elements that comprise resources (e.g. digital tools and collaborative spaces) are important to

influence participation in learning and innovation activities related to idea creation. It is therefore important to consider the individual elements which comprise a set of resources as opposed to assessing the impact of collective resources on innovative work behaviour.

8.5 Skills and abilities of employees that enhance innovative work behaviour

In this research, the participants of the three case studies referred to two types of skills and abilities of employees that enhance and inhibit innovative work behaviour. These are: (1) skills important for interaction and knowledge sharing and; (2) individual and personal characteristics of employees.

8.5.1 Skills important for interactions and knowledge sharing

The findings of this research suggest that there were two main skills important for interaction and knowledge sharing processes. These were communication and engagement.

The participants of all three case studies explained that communication is a key skill to enhance innovation. The participants of the Scottish and Finnish case studies explained that communication helps to (1) exchange information for idea creation and; (2) explore work of others to avoid repetition of idea creation, and collaborate on new ideas (See section 5.3.5 on page 144). In addition, communication helps employees to recognise that they are innovating by sharing ideas with others and receiving feedback. In the English case study, communication was perceived as vital during the idea championing ad implementation phases of innovative work behaviour (See section 7.2.3 on page 194). This is because the English NHS trust studied provides support for the implementation of ideas and the communication helps employees to understand the support available.

The findings reported in this thesis align with the literature reported in Chapter 2 that highlights communication is important for innovation (e.g. Linke & Zerfass, 2011; Messman, 2011; Ortega-Egea et al., 2014 in section 2.4.3 on page 57). As with the findings of the research reported in this thesis, the studies noted above explain that the exchange of knowledge helps to discuss and debate idea creations (Zerfass & Huck, 2007, p.111). Zerfass & Huck (2007, p.111) suggest

that communication is a key skill between producers and users, particularly in the service industry. The findings of this research align with suggestions by Zerfass and Huck given that all of the participants from the case study organisations were part of the healthcare and education service industries.

The findings of this study align with early work such as Ryan and Gross (1943) which suggests that communication is important to innovation. The findings of this study highlight the importance of communication to champion ideas and gather support for (diffuse) ideas in the workplace as noted by Rodgers (1962). In addition, the study findings align with work by Dasgupta et al. (2013) who suggest that the communication of managers influences employee behaviour as well as the various studies that suggest that communication is important for innovation (e.g. Brökel & Binder, 2007; Dasgupta et al., 2013; Linke & Zerfass, 2011; Mayfield & Mayfield, 2004; Messman, 2011; Ortega-Egea et al., 2014). However, the studies reported in this thesis provide additional evidence as to how communication supports the development of the specific innovative work behaviour stages. The differences in findings are attributed to the complex definitions of innovation within the literature (Leeuwis & Aarts, 2010, p.2) as well as the differences in approaches used for communication studies (2010, p.4). The studies reported in this thesis used a mixed methods approach similar to that of Linke and Zerfass (2011), however, participants of these studies were not given a definition of communication as the studies were exploratory and it was unknown at the point of data collection that communication would be an emerging theme. Therefore, it is unknown whether the definition of communication used in this study was the same as those used by studies carried out by Linke and Zerfass (2011) and it is therefore difficult to make direct comparisons.

The participants of the English case study only felt that engagement is also a contributing factor to the development of innovative work behaviour (see section 7.2.3 on page 194). Engagement involves personal skills that help people interact and this can relate to the communication discussed above (i.e. communication and engagement both involve skills in social interaction).

The difference in findings across the three case studies could be explained by the purpose of the service provided to the public. For example, NHS Trust is a

major healthcare service provider to the public. When ideas are created, engagement with service users' needs to be demonstrated in order to gather opinions on whether the ideas are suitable and practical (i.e. through external consultations with members of the public). This means that in settings such as NHS Trusts, engagement is seen as an important factor due the process employees must go through to create and implement ideas (i.e. employees must ensure the ideas are suitable for public need)

The participants of the Scottish University have no formal approval processes from the general public and gave no suggestions as to the need to do so. This means that engagement is dependent on the strategic directions of organisations.

8.5.2 Individual skills and personal characteristics of employees

Participants of this study discussed a variety of personal characteristics and skills that influence innovative work behaviour. However, there was no consistency across the case studies as to the specific skills and abilities that support behaviour development.

The participants of the Scottish University case study emphasised the role of reflection in the creation of new ideas (See section 5.3.5 on page 14). According to the participants, reflection acts as a driver for change when employees recognise the need to make a change or innovate. Reflection also helps employees understand the content of learning and how this can be applied to the creation of new ideas. These findings are in line with research which suggests that reflection and communication are related. The networking, which results from communication, can facilitate the exchange of knowledge. The social learning process allows for the reflection and adaption of ideas during the processes of idea creation and implementation (Lave and Wenger, 1991).

The participants of the Scottish University case study also discussed the role of personal drive and motivation in innovative work behaviour development (See section 5.3.5 on page 144). They viewed personal drive and motivation as helpful for employees to learn new things in the workplace and apply this to creating new ideas. In the views of the participants, employees who are highly

motivated are more likely to create new ideas due to the benefits they experience (e.g. the benefits of knowledge sharing) These findings were reflected in the findings of the analysis of the quantitative questionnaire in Scottish and Finnish case studies where personal drive was rated as important for innovative work behaviour development (see section 5.4.1.4 on page 158 and section 6.4.1 on page 177).

Although participants of the English NHS case study did not discuss personal drive specifically, they did suggest that the mind-set of employees encourages other to do the same in section 7.2.3 on page 194 (e.g. if employees have a positive mind-set and create ideas, they encourage others to do so too).

Like the findings of this work, studies often explore mind-set as one element of larger study (e.g. Linder et al., 2003.). This explained why the findings of this research are similar to that of Linder et al. (2003).

Mind-set was not discussed by all participants in all case studies which indicates that mind-set is viewed on an individual employee basis (as opposed to a common characteristic viewed by most participants). The findings of this study therefore do not align its work which suggests that mind-set is important for innovation (e.g. Kuczmarski, 1996; Marcy & Mumford, 2007).

The difference in findings could be explained by the difference in methodologies used to study the concepts. This is because the research by Marcy and Mumford (2007) deliberately induces a certain mind-set from participants by asking them to complete certain tasks in an experimental setting. The mind-sets of the participants were guided by the fact that they are in an experimental setting as opposed to the natural workplace setting as studied in this research. Therefore, the findings of the research reported in this thesis may reflect the natural occurrences of employees in the workplace as opposed to the findings of studies in experimental settings.

8.6 Determinants (i.e. signals or indicators) of the workplace learning of innovative work behaviour

The final research question is concerned with *evidence* that workplace learning has led to innovative work behaviour by asking 'What are the determinants (i.e. signals or indicators) of successful workplace learning for innovative work

behaviour?'. In short, the discussion below highlights the signals that indicate that workplace learning in an organisation is indeed supporting innovative work behaviour.

Examples of prior work that has highlighted how to assess whether workplace learning has led to innovative work behaviour are provided in Chapter 2 (see pages 31, 35 and 52). This discussion makes reference to the following indicators:

- Information seeking to gather information to create new ideas (see page 31);
- Knowledge acquisition through knowledge sharing in groups (i.e. CoPs) which is then applied to the creation of new ideas (see page 35);
- An enhancement of knowledge and skills through participation in training activities. This helps employees to make changes in the workplace (e.g. apply learned knowledge or create new ideas in the workplace as noted on page 52).

The empirical work conducted for this study, as reported in the preceding chapters, indicates four strong signals that workplace learning for innovative workplace behaviour. These are: (1) process innovation; (2) evidence of implemented changes in the workplace; (3) physically seeing changes in employee behaviours and; (4) the sharing of knowledge on innovations that results from learning. Each is discussed in turn below.

The most obvious signal that workplace learning has supported innovative work behaviour is that it is possible to track process innovation back to instances of workplace learning. For example, this was evident in the Scottish case study in respect of the knowledge gained from seeking information from other employees and using this information to improve workplace processes as elaborated on page 126 and 127. Here, the outcome (i.e. signal or indicator) was process innovation (i.e. a change in workplace processes).

The next signal that workplace learning has supported innovative work behaviour is that it is possible to evidence (physically see) that a change has occurred from the learning that has taken place. For example, this is evidenced in the Scottish case study when P55, elaborated on page 139-140, explained

that the creation of a new ideas in the workplace must be implemented to see the change. In addition, this is evidenced in the creation of a new service in the Scottish case study as elaborated on page 138. This implementation of ideas is also evidenced in the English case study where P64 on page 189 had reviewed workplace processes and learned that a new process was needed.

The next signal that workplace learning has supported innovative work behaviour is that it is possible to see a change in employee behaviour. This is evidenced in the Finnish case study in respect of the participants exchanging ideas with external employees. Here, the outcome is the creation of a new idea (something that would not have occurred had P78 not sight support from the external employee). This change in behaviour is also evidenced on page 168 when P82 used the learning from the information they had analysed to present an idea to others. Change is a necessary part of innovation as detailed in section 2.4.2.1 starting on page 41.

The final signal that workplace learning has supported innovative work behaviour is that the learning is shared across the organisation. For example, this was evidenced in the English case study in respect of sharing knowledge learned and the innovation that resulted from this learning elaborated on page 185. The outcome here is that other people (unrelated to the innovation) are aware of innovation taking place as a result of learning. The sharing of knowledge is vital for learning and innovation as noted in the literature discussed in this thesis (see section 2.4.1.4 on page 34).

The articulation of these determinants (signals or indicators) that workplace learning has indeed been successful in supporting innovative work behaviour on the basis of the analysis of empirical data in this study is valuable for several reasons. First, it adds to the extant body of literature by strengthening the argument that knowledge learned and applied from learning and innovation activities (e.g. training, knowledge sharing and communication) are important indicators of success and does so at a greater level of granularity than previously presented.

Second, this work identifies new outcomes that might be considered as markers of success: evidence of idea creation, implementation and employee behaviour change in respect of innovative work behaviour development (i.e. recognise the

need to innovate, create ideas, champion ideas and, implement ideas in the workplace). These are:

1. Evidence process innovation (e.g. changed to old or the creation of new workplace processes);

2. Seeing changes made in the workplace;

3. Seeing changes in employee behaviour in respect of creating, championing and implementing ideas;

4. The sharing of knowledge on learning and the innovation that has resulted from this learning (e.g. with other departments or employees not involved in the innovation).

Third, these determinants can be used by organisations to evaluate and benchmark the extent to which their own efforts to encourage workplace learning have an impact on innovative work behaviour.

8.7 The use of Social Cognitive Theory in the study of innovative work behaviour through workplace learning

In the sections above, factors that enhance and inhibit innovative work behaviour development were identified and discussed. Three factors were deemed most important. These were information behaviours, organisational culture and, leadership. Four factors were less important. These were information literacy, training and learning, access to resources and, skills and abilities of employees.

New knowledge was created on the role of information literacy in the workplace learning of innovative work behaviours, and the contributions of specific information behaviours to innovative work behaviour development. In addition, the role of contextual factors was discussed and knowledge fostered on the importance of culture ad leadership in innovative work behaviour development. Within the discussion of the contextual factors, the importance of training was questioned with relevance to the existing literature. Here, new knowledge was fostered on the importance of training for innovation as well as the contribution of individual skills and abilities of employees in learning innovative work behaviour.

The study of innovative work behaviour development in this research was underpinned by Social Cognitive Theory (see Chapter 3 on page 67). SCT was used to support the exploration of the development of innovative work behaviours through workplace learning in multiple workplace contexts.

An additional contribution of this research is the application of Social Cognitive Theory to real-world learning settings using employees of real organisations in their own workplaces. For example, much of the concepts studied from the Psychological perspective uses students as the study subjects. This is reported in a number of early studies (Henley & Savage, 1994; Higbee et al., 1982; Higbee & Wells, 1972). Often, students are subject to experiences of manipulation of experiences, which do not reflect real-life occurrences outside of that study setting. This problem is noted by Marcy and Mumford (2007, p.136) who note that studies that use the classical laboratory paradigm are limited in terms of the generalisability outside of this setting. This issue was noted in early work by Valentine (1982) who believed over three quarters of Psychology research used students. Kimmel (1996) suggests that up to 70% of studies in social and personality psychology used students as participants and up to 90% in cognitive psychology studies. This issue was later addressed by Foot and Sander (2004) in The Psychologist with focus on the use, potential above of but convenience of using students. However, later work suggest that this is still ongoing (Henrich et al., 2010). Some Psychologists have suggested the use of students is a barrier to academic concept development (Kressel, 1990). This work draws upon criticisms of work carried out from the psychological perspective and explores concepts of innovation from an information science perspective. Although the use of a psychologically derived theoretical framework has been applied, this work extends the application of the theory to contexts outside of the university students setting (and consequently reflects the natural relationships that occur in workplace settings).

It is also important to highlight the contributions of how the findings from this research map to SCT. In the findings of the research reported in this thesis, it is acknowledged that some of the factors that enhance and inhibit innovative work behaviour work together. This concept (i.e. reciprocal determinism), alongside other concepts in SCT (e.g. self-efficacy and learning orientation) were explained in Chapter 3 (see section 3.1.1 on page 69). The extension of the key

concepts of SCT from the findings of this research are discussed in the sections that follow.

8.7.1 Triadic reciprocal causation

The findings reported in this thesis provide evidence as to the concept of 'Triadic Reciprocal Causation' as discussed on in section 3.1.1. on page 70. The findings of this study suggest that several environmental, behavioural and cognitive factors enhance innovative work behaviour (see section 3.1.1 on page 71 of this discussion chapter). For example, the organisational culture (an environmental factor) supports employees to share knowledge in the workplace (a behavioural factor) and then to apply the knowledge to the creation of new ideas in the workplace. This knowledge sharing is dependent upon the information literacy and communication skills of employees (cognitive factors) to help employees process and understand the information and knowledge shared.

The findings reported in this thesis also provide evidence of 'reciprocal determinism' (see section 3.1.1 on page 70). Reciprocal determinism explains the interactions between social and cognitive factors of learning and indicate that these factors, together, are determinants of behaviour. The findings of the empirical work reported in this thesis revealed that information literacy is viewed as a skill-set of employees (i.e. how employees process and use the information). Only when employees can understand how to effectively use and apply information behaviour in the workplace, they are able to develop innovative work behaviour successfully. This interaction between the cognitive and social factors in the workplace is key to support employees to develop innovative work behaviour by providing an initial understanding of how to apply information in the workplace context before acting to do so.

The findings of this study extend the application of the concepts of triadic reciprocal causation and reciprocal determinism to that of the learning of innovative work behaviour. Prior work (as noted in section 3.1.3 on page 77 of this thesis) has demonstrated the application of triadic reciprocal causation to either learning specifically or motivations for learning. The findings reported here provide evidence that the behaviour change (the main focus of SCT) does not necessarily need to be learning directly but it can be behavioural change

related to the product of learning (i.e. innovative work behaviour through workplace learning processes). In addition, this learning can take place in multiple workplace contexts as suggested by the prior use of SCT in research (See section 3.2.1 on page 72 for application in organisational studies and psychology work and, section 3.1.3 on page 75 for application in Information Science work). This extends the application of SCT to workplace contexts as opposed to the application of SCT to mainly educational contexts.

8.7.2 Self-efficacy

The findings of the study revealed that there were motivations for sharing knowledge, including self-efficacy. For example, the participants of the Scottish case study shared knowledge to apply the new knowledge to the creation of new ideas (see section 5.3.2 on page 136). At the same time, the participants of the Finnish case study noted that they share knowledge to learn new processes and procedures in the workplace (see section 6.3.2 on page 169). This helps them to build skills in the workplace. The participants of the English case study shared knowledge of their created ideas to gain knowledge on support available to implement the ideas (see section 7.2.1 on page 189). The support given here helps employees to take actions towards idea implementation when that believe that it is possible to do so. The self-efficacy demonstrated here acts as a motivational factor for employees to behave in a specific way to implement their ideas (e.g. approach others for support).

Self-efficacy was noted as a main reason for knowledge sharing in the in the literature presented in section 2.4.1.3 on page 33 and section 3.1.3 on page 75 of this thesis (e.g. Case & Given, 2016: 2010; Cheung et al., 2013; Chiu et al., 2006; Cho et al., 2010; Kuo & Young, 2008; Liou et al., 2016; Savolinen, 2012; Wilson & Walsh, 1996; Zakaria et al., 2013; Zhou, 2014). This is particularly evident in the Information Science literature where is the main motivational factor to seek and share knowledge (See section 3.1.3 on page 75).

In the studies noted above, self-efficacy is used as the main theoretical underpinning of the research as opposed to the whole of SCT. Here, much emphasis is placed on self-efficacy as a main part of SCT, a concept that is vital for learning and skill development according to Bandura (see Chapter 3, section 3.1.1. on pages 70-71).

The findings of the research reported in this thesis indicate that self-efficacy is only one of many components of learning enhancement. Bandura (1977) suggests that self-efficacy is a cognitive mediator of action (see page 70) and helps people to process stimuli that they use. However, the findings of the research reported here emphasise the importance of other factors in behaviour enhancement (see the discussion of triadic reciprocal causation in section 8.7.1 above). In addition, no participant in this study referred to self-efficacy directly. Instead, the discussions with the study participants centred on the reasons why they knowledge share and how they behave to do so as opposed to focusing on self-efficacy alone. A main contribution of this research is the extension of knowledge from the findings that support the need to apply the whole Social Cognitive Theory to the study of concepts, especially in in Information Science research, as opposed to choosing smaller components that build SCT (e.g. self-efficacy).

8.7.3 Learning orientation

The findings of this research suggested that the mind-set of employees is important for innovative work behaviour development. This was noted by two of the twelve participants of the English case study only and no other participants (see section 7.2.3 on page 195). The mind-set was seen as important for developing the confidence to innovate and also to support others to innovate in the workplace.

The findings reported here are in line with the concept of learning orientation in SCT (see section 3.3.1 on page 70). Here, the participants suggested that they develop confidence to help them to innovate in the workplace (i.e. to try new things with the reduced fear of consequences to failure).

As noted in the explanation of SCT in this thesis learning orientation is the mind-set that motivates the development of confidence (rather than confidence as an outcome) on the basis of existing skills, knowledge and ability (see section 3.3.1 on page 70 of this thesis). This was a key theme that emerged from the discussions with the two participants noted above (i.e. that the confidence is a contributor to innovative work behaviour development as opposed to an outcome). However, as only 2 out of the 83 participants in this research discussed learning orientation as part of the data collection, it can be

concluded that learning orientation may not as important as implied in SCT (i.e. other factors do play a role in behaviour change, such as learning and innovative work behaviour development).

8.8 Future research

From the discussion of the findings this research, the research discussed in this thesis could be extended in a number of ways. Initially, the extension of study findings could be validated with the conduction of the work in other National Health Service (NHS) Trusts and Universities to explore replicability of the study. In doing so, this would allow for further evidence to be generated as to the factors that influence innovative work behaviour development in those particular workplace contexts (e.g. culture and leadership). At the same time, the study design could be applied to other workplace contexts outside of healthcare and education to furnish knowledge on whether similar or different factors influence innovative work behaviour development, and whether the framework created in this study would require some adaptation.

Additional research could be carried out to quantify the instances of innovative work behaviour in the workplace. This could take two forms. Firstly, an observational study could be used to assess employee engagement in innovative work behaviour. In doing so this would allow for innovations to be explored from start to finish as opposed to the examples of specific phases given by participants in this study. This would address the lack of examples of idea implementation in this study. Acknowledging the time innovations often take to develop from idea recognition to idea implementation, it would be useful to adopt a longitudinal study approach where employees of organisations record information themselves, are observed and are interviewed. A combination of data collection methods would help to reduce bias from observations and participant self-assessment.

To extend this work further in the information science domain, further work could be carried out regarding the influence of information literacy on innovative work behaviour development. As there is yet no quantitative assessment of *workplace* information literacy (e.g. through a questionnaire), prior information literacy models could be adapted and tested to assess information literacy workplace contexts using quantitative methods. In developing a quantitative

information literacy assessment tool, it may then be possible to assess the extent to which the elements of information literacy influence innovative work behaviour development at each stage of the process (i.e. idea recognition, idea creation, idea championing and, idea implementation). This could be done using a validated innovative work behaviour scale to identify relationships between variables (e.g. correlations or predictive relationships). Such relationships could then be followed up with qualitative studies to explore the reasons behind the relationships presented.

8.9 Conclusion

From the discussion of the findings in this chapter, several contributions of this work to knowledge and practice have been identified. Five main contributions to knowledge are given below, followed by a summary of the suggestions for future work. The main contributions to knowledge are:

1. **Knowledge has been furnished on the contribution of information literacy furnished by workplace learning to the development of innovative work behaviour.** To date, there is no research which has directly explored the extent to which innovative work behaviour is enhanced or hindered by information literacy. The work reported in this thesis has done so with specific reference to the four processes involved (i.e. recognition of the need to innovate, idea creation, idea championing and, idea implementation). The focus of findings was the role of information literacy in the initial stages of innovative work behaviour (e.g. as an initiator of recognition of the need to innovate and the creation of ideas).

2. **Knowledge has been created on the role of specific information behaviours in all four stages of innovative work behaviour development.** Studies reviewed in Chapter 2 of this thesis investigate information behaviours with reference to innovation (see section 2.4.1.2 on page 30). Much of this work has explored information behaviours in respect of specific processes involved in innovation (collectively) rather than (employee-led) innovative work behaviour as a whole (e.g. Hauschildt, 1996). In this research, knowledge has been furnished on the contribution of specific information behaviours to innovative work behaviour. The findings of this work identify how information seeking, information interpretation and analysis and, knowledge sharing enhance and hinder innovative work behaviour development.

3. **Knowledge has been fostered on the importance of training in innovative work behaviour development.** The literature reported in Chapter 2 gives details of the contribution of training to innovation (see section 2.4.2.5 on page 51). The findings of this research extend knowledge on the contribution of training to innovative work behaviour

development. Training is an important element of learning as noted in section 8.4.3 on page 232. It is the application of skills and knowledge acquired through training that supports innovative work behaviour development (i.e. not the training itself).

4. **Knowledge has been furnished on determinants (i.e. signals or indicators) of successful workplace learning as related to innovative work behaviour development.** Knowledge has been furnished on the determinants of successful workplace learning. From answering research question 3 (see section 8.6 on page 240), the determinants of successful workplace learning of innovative work behaviour are: (1) Evidence of process innovation (e.g. changes to old or the creation of new workplace processes); (2) Seeing changes made in the workplace; (3) Seeing changes in employee in respect of creating, championing and implementing ideas and; (4) The sharing of knowledge on learning and the innovation that has resulted from this learning (e.g. with other departments or employees not involved in the innovation).

5. **The application of the full Social Cognitive Theory in Information Science research on workplace learning and innovative work behaviour**. Studies in information science, organisational studies and psychology have applied part of Social Cognitive Theory to the study of leaning and innovation (see section 3.1.3 and 3.1.4 starting on page 76). To date, no study of innovative work behaviour has been underpinned solely by Social Cognitive Theory (Bandura, 1986) and used the theory as a whole as part of one larger study (i.e. the use of all concepts of self-efficacy, learning orientation and, triadic reciprocal causation in one study). This extends the application of the concepts within the theory to workplace learning and innovative work behaviour to Information Science work. In doing so, evidence has also been provided as to the importance of self-efficacy and learning orientation (two main concepts within SCT) in learning. For example, the literature places much emphasis on these concepts in the changing of behaviour whereas this study provides evidence that these concepts do not explain behaviour in great detail as stand-alone concepts.

There is one main practical contribution to practice from this work:

1. **The creation of a framework to explain the factors that influence innovative work behaviour development and how organisations can support such development in the workplace.** The answering of research questions 1-3 has furnished knowledge as to the factors that enhance and hinder innovative work behaviour from employees. From these findings, a framework for the enhancement of innovative work behaviour has been created, which includes how organisations can support the innovative work behaviour development (see section 9.3 on page 257). In the conclusion chapter, a series of recommendations to practitioners are provided (see section 9.4 on page 264). These recommendations have been drawn from the creation of the framework noted here.

The discussion of the findings reported in this thesis has also led to suggestions for future work. These include the extension of the work to other workplace contexts and further work to quality the instances of innovative work behaviour that employees demonstrate. Future work in the area of information literacy would allow for exploration of the specific stages of innovative work behaviour to be assessed against characteristics of information literacy and information behaviours.

Chapter 9: Conclusion

9.1 Introduction

The purpose of the research reported in this thesis has been to investigate the factors that influence the development of innovative work behaviour, and to create a framework to explain how organisations can support employees to develop innovative work behaviour through processes of workplace learning. To do so, information literacy (including information behaviours) and contextual factors were explored to determine how these factors contribute to innovate work behaviour development. In addition, the research aimed to identify the determinants (i.e. signals or indicators) of successful workplace learning of innovative work behaviour to provide recommendations to practitioners from the development of the framework noted above.

In this chapter, the key research questions are revisited to reflect upon the contributions of the research to knowledge. This incudes the contributions to knowledge in respect of the factors that enhance and inhibit innovative work behaviour that emerged from the findings of this study and the determinants in the study. This section also includes the use of Social Cognitive Theory (Bandura, 1986) to underpin Information Science research on the development of innovative work behaviour through workplace learning processes.

Next, the main practical contribution of this research is explained. A framework for the enhancement of innovative work behaviour through workplace learning is discussed (see section 9.3 on page 258). This framework identifies the factors that enhance and inhibit innovative work behaviour through workplace learning processes. The framework is used to provide recommendations to practitioners and policy makers in the concluding chapter of this thesis (see Chapter 9, section 9.4 on page 264).

Following this, recommendations to practitioners are given and the chapter is concluded with the strengths and limitations of the research as well as the implications of the research findings.

9.2 The main findings of work and contributions to knowledge

Interviews, focus groups and questionnaires were used to gather data as part of three case studies of different organisations: A Scottish University, a Finnish University and an English NHS Trust. The data was analysed to answer the three research questions revisited in this section see Table 34 for a summary of the findings for research question 1).

The first question addressed in this research is:

RQ1: How does information literacy (including information behaviours) support successful workplace learning as related to the development of innovative work behaviour?

Table 34: Summary table of findings for research question 1

Innovative work behaviour processes (West & Farr, 1990)	Contribution of information literacy and information behaviours to innovative work behaviour development						
	Information literacy	Information needs recognition	Information Seeking	Information interpretation	Information analysis	Information and knowledge sharing	Information source
Recognise the need to innovate	X	X		X	X	X	
Create idea	X		X	X	X	X	
Champion idea	X	X		X	X	X	X
Implement idea					X	X	

Interviews, focus groups and questionnaires were used to gather data as part of three case studies of different organisations: A Scottish University, a Finnish University and an English NHS Trust. In answering this research question, a key contribution of this research is that knowledge has been established on the contribution of information literacy to the specific stages of innovative work behaviour development (see Table 34 on page 252 above). Within this, it has been shows that information literacy acts as an initiator of workplace learning of innovative work behaviour to help to set context and present a bigger picture of the information needed for innovation.

In addition, another key contribution of this work is that knowledge has been established on the role of specific information behaviours on innovative work behaviour development. It has been shown that knowledge sharing and information analysis are vital at all stages of innovative work behaviour to help employees to give meaning to and share information relating to obtain knowledge to create and implement ideas. However, other information behaviours relate to the individual stages of innovative work behaviour, and not all. For example, information seeking helps employees to gather information for the creation of ideas and, information needs recognition helps employees to recognise that an idea needs creating (due to missing information) and to champion ideas (to help employees to seek information when creating ideas).

Finally, information overload and difficulty in navigating information sources are inhibitors and lead to the early termination of innovative work behaviour.

The second question addressed in this research is:

> **RQ2:** How do contextual factors support innovative work behaviour for application at individual and collective levels in the workplace?

Provided in Table 35 is a summary of the findings to answer research question 2.

Table 35: Summary table of findings for research question 2

Innovative work behaviour processes (West & Farr, 1990)	Contributing factors to innovation (themes from participant responses)						
	Information interpretation	Information and knowledge sharing	Information source	Culture	Skills and abilities of employees	Access to resources	Training and learning
Recognise the need to innovate	X				X		
Create idea		X		X	X	X	X
Champion idea		X	X	X	X		X
Implement idea		X		X			

In answering research question 2: 'How do contextual factors support innovative work behaviour for application at individual and collective levels in the workplace?', knowledge has been created on the contribution of contextual factors in innovative work behaviour development. The organisational culture enhances innovative work behaviour if it welcomes change and supports employees to create and implement ideas. Leaders play a vital role in the promotion of culture and the expected behaviours form employees as detailed in the organisational strategy. Leaders help to enhance the success of innovative work behaviour, but this is inhibited if leaders do not provide support for innovation.

A contribution of this work is the creation of knowledge of the role of practical elements in the workplace on innovative work behaviour development (e.g. training and access to resources). Although the literature emphasises the importance of training and resources in innovation, the findings of this study suggest that training alone does not enhance innovative work behaviour. Instead, it is the support given from colleagues and leadership to provide the practical support that enhances innovation.

In answering research question 2: 'How do contextual factors support innovative work behaviour for application at individual and collective levels in the workplace?', the findings of this research show that the skills and abilities of employees enhance innovative work behaviour. Social interaction and knowledge sharing skills (e.g. communication and engagement) are vital to help employees to create, share and implement ideas in the workplace. At the same time, skills related to individual employees (e.g. reflection, fear of failure and, mind-set) helps employees to process information, and support other employees to innovate, but these can also inhibit innovation.

The third question addressed in this research is:

> **RQ3:** What are the determinants (i.e. signals or indicators) of successful workplace learning for innovative work behaviour?

This research question was designed to gather information from the participants as examples of good practice as related to innovative work behaviour

development in the workplace. The findings of this study suggest that the following are signals or indicators of successful innovative work behaviour:

1. Evidence of process innovation in the workplace;
2. Evidence of implemented changes in the workplace;
3. Visible changes in employee behaviours and;
4. The sharing of knowledge on innovations that result from learning.

These findings have helped to shape the main practical contribution of this work: the creation of recommendations for practitioners (see section 9.3 of this chapter on page 258).

Social Cognitive Theory (Bandura, 1986) was used as a framework to underpin the research design, analysis of data for this work and the design of the framework as the main practical contribution of this work (see section 9.3 on page 258). Prior research has explored the use of concepts in Social Cognitive Theory in Information Science research (see Chapter 3, section 3.1.3 on page 76) and associated literature domains (see Chapter 3, section 3.1.2 on page 80). However, this is the first study to use the whole of Social Cognitive Theory in information science research on workplace learning and innovative work behaviour development. A theoretical contribution of this work is the provision evidence as to the application of Social Cognitive Theory concepts (e.g. self-efficacy, learning orientation and triadic reciprocal causation) as a whole in one study as opposed to the use of single concepts in SCT as opposed to the use of once concept of SCT to underpin the work. This evidence is highlighted in the findings of this research where the inter-relations between the factors that influence innovative work behaviour emerged.

Bandura (1986) also places much emphasis on the concepts of self-efficacy in learning and behaviour development (see Chapter 3 section 3.1.1 on page 72). However, the findings of this research suggest that although self-efficacy is important in learning and behaviour, it may not be as vital as suggested in SCT. The findings of this study suggest that instead, self-efficacy is intertwined in the informational and contextual factors that were highlighted in the answering of research questions 1 and 2, and it acts as a mediator for employee behaviours to develop rather than directly enhance innovative work behaviour.

9.3 A framework for the enhancement of innovative work behaviour through workplace learning

The main aim of the research reported in this thesis was to identify the enhancers and inhibitors of innovative work behaviour. In addition, the research aimed to identify the determinants (i.e. signals or indicator) of the learning of innovative work behaviour. The factors and determinants identified related to the main practical output of this research, a framework to explain the enhancement of innovative work behaviour through workplace learning processes. From the development of the framework, recommendations for practitioners are provided in the conclusion chapter of this thesis (see section 9.4 on page 264).

The framework reported in this section is the main contribution of this research. This is the main contrition of this research as it combines knowledge furnished on innovative work behaviour development to create the final framework. To date, this knowledge has been lacking within the literature and the complexity the factors that enhance and inhibit innovative work behaviour has meant that prior work has not focused on the full picture of innovative work behaviour development (e.g. some research has only focused on one or two factors). The knowledge furnished to create the framework extends existing knowledge in respect of:

- The contribution of information literacy to the four stages of innovative work behaviour;
- The impact of specific information behaviours on the four stages of innovative work behaviour development;
- The specific impact that culture and leadership have on innovative work behaviour stages;
- The influence of training on innovative work behaviour and the need to focus on other factors as well as training (e.g. resources).

The framework brings together all of these contributions to knowledge to create one larger practical contributions of this research. This main contributions of the knowledge developed to explain the factors that influence innovative work behaviour development as a whole set of processes together. The practical contributions of the framework that explains the factors that enhance and inhibit

258

all stages of innovative work behaviour development which include: (1) recognition of the need to innovate; (2) idea creation; (3) idea championing and; (4) idea implementation.

In this section, the stages of the framework development are explained. This comprises: (1) categorisation of factors as either cognitive, environmental or behavioural factors of Social Cognitive Theory; (2) a representation of the specific relationships between factors and stages of invasive work behaviour derived from the findings of this work and; (3) a visual representation of the factors that influence innovative work behaviour at each stage, and recommendations to accompany this representation.

Social Cognitive Theory (1986) was used to underpin this work. Part of this was to underpin the creation of the framework as the main output of this work. The first stage of the framework development involved categorising each of the factors as either cognitive, environmental or behavioural as depicted in Social Cognitive Theory as part of the analysis of the interview and focus groups data. The factors identified form the analysis of interview focus group and questionnaire data were categories as either:

1. **Behavioural factors** (i.e. factors that relate to the behaviours of themselves or other people);
2. **Environmental factors** (i.e. factors within the employees' environment which can impact behaviour) and;
3. **Cognitive factors** (i.e. factors relate to the internal thought processes of people).

The initial categorisation of the factors that emerged from the analysis of interview, focus group and questionnaire data is visualised in Figure 6.

Environmental factors

Cognitive factors

Culture

Organisational strategy

Leadership

Training and resources

Information literacy

Social/interaction skills of employees

Personal skills/attitudes of employees

IWB

Information seeking

Information analysis and interpretation

Information and knowledge sharing

Behavioural factors
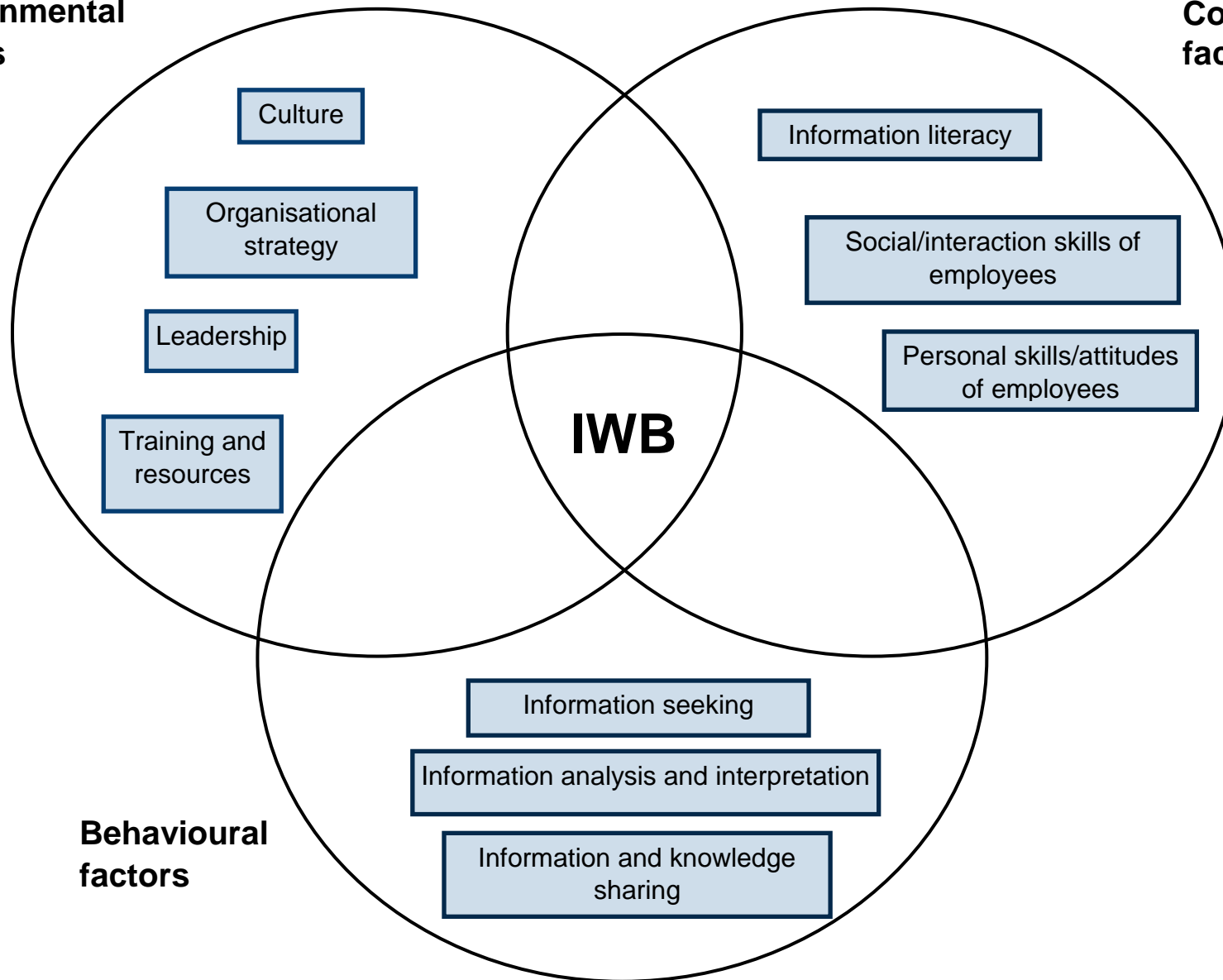
Figure 6: The initial categorisation of the factors that enhance and inhibit innovative work behaviour (IWB)

Figure 6 details the categorisations of the factors that enhance and inhibit innovative work behaviour development. Some of the factors overlap with other categorisations in terms of how they are classified to support innovative work behaviour development. For example, leadership is environmental in terms of the provision of a leadership team within organisations to support employees. However, leaders within the leadership team exhibit certain behaviours to promote innovative work behaviour from employees.

Information literacy is seen as a skill set which helps employees identify and decide on suitable information behaviours to exhibit. At the same time, information literacy can be promoted and enhanced be the workplace environment (i.e. in terms of training programmes to enhance information literacy skills).

In respect of information and knowledge sharing, this is a specific behaviour of employees themselves. However, the culture of the organisation and the leadership can help to promote the information and knowledge sharing form employees.

These relationships evidence that the three sets of factors that interplay, interact, and bear influence on each other (see Section 8.7.1 on page 242 of this chapter for further discussion). The development of the framework as a main output of this study has relied heavily upon the categorisation of the factors that influence innovative work behaviour and determining the specific relationships between the factors as to how they influence each other and then innovative work behaviour development.

To help with the creation of recommendations to practitioner, there was a need to represent these findings in a figure to indicate how organisations and employers can enhance such behaviour for employees. The final framework is represented in Figure 7 below.

Recognition of the need to innovate	• Organisational culture helps employees to recognise the need to innovate. • Attitude and personal skills of employees help employees to promote the need to innovate to other employees. • Information literacy helps to set context as to the information needed to innovate. • Information analysis and interpretation helps employees to understand how to apply information to innovations. • Information and knowledge sharing helps employees to interact and discuss why innovations are needed and identify gaps for idea creation.
Idea creation	• Organisational culture promotes idea creation from employees and enhances idea creation by providing support (e.g. in risk taking and change). This is only successful if the culture promotes behaviours set out in the strategy. • Leaders helps to people behaviour expected form the culture. They provide vital sources such as training, and suitable infrastructure (e.g. a collaborative space). Leaders promote knowledge sharing to help employees collaborate. • Information searching is key to find information to apply to idea creation. Employees then need to analyse and interpret this information to understand the meaning of information and apply this to the ideas created. • Knowledge sharing helps employees to share ideas created and assess the suitability of the idea.
Championing of ideas	• Organisational culture supports idea championing if collaboration and knowledge sharing are welcomed. • Leaders help to prepare employees for change and support them to welcome the introduction of new ideas. They provide suitable infrastructure for collaboration as well as the promotion of behaviours to help employees share ideas (e.g. knowledge sharing). This is related to the expectations set out in the culture and strategy of the organisation. • Information analysis helps employees to add meaning to information and to then present this to colleagues in championing the idea. Skills in social interaction are vital here.
Implementation of ideas	• The organisational culture promotes ideas implementation as part of the expected behaviours from employees (e.g. to become involved in idea implementation). • The leadership team help to provide resources for implementation (e.g. infrastructure for collaboration and, resources) • Social and interaction skills from employees are key here to promote the ideas to those who are involved in implementation and for employees to draw on and emphasise the benefits of the idea to key stakeholders (to encourage support for implementation). Knowledge sharing is a vital behaviour in this stage. • Personal skills and attitude help to promote the benefits of the idea to key stakeholders.

Figure 7: A framework for the enhancement of innovative work behaviour through workplace learning

262

The framework detailed in Figure 7 explains the factors that enhance innovative work behaviour development. Below, further details are given as to the factors that enhance the four stages of innovative work behaviour: (1) recognition of the need to innovate; (2) idea creation; (3) championing of ideas and; (4) implementation of ideas

9.3.1 Recognition of the need to innovate

The culture of the organisation is vital in the initial stages of innovative work behaviour to support employees to recognise the e to innovate. This is done through the promotion of problem solving and evaluation of situations where innovation may be of benefit (e.g. processes within a university setting). The individual employees play a key role in this stage, primarily in the way in which they deal with information. For example, skills in information literacy are helpful for employees to begin to process information and then use specific information behaviours (e.g. information interpretation, information analysis and information sharing) to process the information. The attitude and personal skills of employees helps the promotion of innovation and seeking opportunities to innovate. This is also specific to the promotion of innovation from leaders within the organisation in line with the expectations that the culture promotes.

9.3.2 Idea creation

The organisational culture is also key for idea creation as it provides the basis for ideas creation through means of support and encouragement for employees to create new ideas. In addition the culture helps employees to consider the impact of risk and change in the ideas they create. Leaders within the workplace help employees to display the behaviours expected from the organisational culture. They also provide practical support for idea creation (e.g. promote knowledge sharing and provide collaborative spaces) to allow for the exchange of ideas to occur. However, if leaders do not promote such behaviours, or have a negative attitude towards innovation this can hinder innovative work behaviour from employees. At this stage, it is important to recognise that information overload may lead to the early termination of innovation if employees are unable to process the information and use if to create ideas.

9.3.3 Championing of ideas

One of the main factors that enhances the championing of ideas is information and knowledge sharing. The culture and leaders within the organisational provide the basis to support employees to share knowledge as noted in the idea creation stage above. In addition, leaders can provide support to employees who are struggling to welcome change, or to promote the benefits of the newly created ideas. However, other skills in information are needed in this stage to enable employees to discuss the suitability of ideas with others and gain support for idea implementation (the next stage). For example, information analysis helps employees to add meaning to information and use it when presenting the information to colleagues. Here, the social and interaction skills of the individual employees are important to help with the flow of verbal dialogue.

9.3.4 The implementation of ideas

The final stage of innovative work behaviour is idea implementation. Here, social and interaction skills from employees are vital in order to promote the ideas to those involved in implementation (e.g. stakeholders or other parties). The personal skills and attitudes of employees help to enhance the relationship with stakeholders, and other people involved in the implantation (i.e. if there is a positive attitude from the idea creator, they may be able to promote the idea with more enthusiasm and explain the benefits). In this stage, the organisational culture is important to allow employees to become involved in idea implementation and the leaders are important to help to provide resources for implementation (e.g. time, funding and support).

9.4 Contributions to practice and practical recommendations

The main practical contribution of this work is the development of a framework to explain how organisations can support the enhancement of innovative work behaviour (see section 9.3 on page 256) and the creation of recommendations for policy makes and practitioners working to do so. The development of the framework reported in Chapter 8 in this thesis has led to the creation of recommendations for policy and practice.

The answering of research question 1 as to the how information literacy and information behaviours enhance and inhibit innovative work behaviour development has led to the following recommendations:

1. **Recognise the importance of information literacy in a digital age, [i.e. the ability to locate relevant information, evaluate it appropriately and use it effectively].** Practitioners may wish to evaluate the skills and abilities of employees before expecting the use of information in the creation of innovations. Further support may be required for those who have not developed information literacy skills. This is become information literacy is a prerequisite to innovative work behaviour and helps employees to identify the behaviours needed to create and implement ideas in the workplace.

2. **Recognise the need for more interactive information sources (i.e. involving people rather than paper) which enable processes of questioning and reflection to occur.** Practitioners may wish to consider using more interactive information sources when asking employees to create new ideas and this stimulates the process of reflection. Additionally, a formal feedback procedure could benefit employees who may feel less confident in creating new ideas in the workplace, both in terms of increasing confidence, innovative work behaviour and having support to do so.

3. **Recognise the need to allow and enhance communication to stimulate conversations, information exchange and knowledge sharing.** These processes are vital in all elements of innovative work behaviour, and were vital skills in innovative work behaviour as identified in the findings of this study. Employees would benefit from workplace strategies that promote interaction and communication strategies in the workplace (e.g. the provision of opportunities and suitable infrastructure to collaborate).

4. **Recognise the need to consider the methods of communication to reduce information overload.** Practitioners should think about the methods used to communicate with employees in order to avoid information overload. Key messages should be communicated to highlight the importance of the message conveyed. Communication

with employees through a variety of methods (i.e. not just email) will allow employees to have the means to digest information they receive and decide if the information can be used.

5. **Recognise the need to assess the resources (individually) available in the workplace.** Practitioners should assess the individual resources available in the workplace (e.g. a collaborative space, access to digital tools and, training). This is because individual resources were found to enhance innovative work behaviour but taken collectively resources did not enhance innovative work behaviour.

The answering of research question 2 with respect of contextual factors that enhance and inhibit innovative work behaviour development has created the following recommendations:

1. **Policy makers may wish to develop the organisational strategy in line with the expectations of employee behaviour.** The findings of this study suggest that innovative work behaviour is more successful if the organisational culture and strategy align. For example, in a department of one of the case studies, a document had been created as to how employees should behave in relation to the culture (e.g. provide feedback constructively and, support colleagues). This document was promoted across the department and supported employees to innovate as they understood there would be no negative behaviour displayed towards them if an idea failed or was not suitable.

2. **Leaders need to communicate and promote the organisational culture at all levels of the organisational to emphasis the support provide for employees who wish to innovate.** The findings of this study demonstrate that the views of levels and non-leaders often did not align, and non-managerial employees felt further support was required from leaders (in respect of supporting ideas to be implemented). Therefore, practitioners should consider the channels of communication and knowledge management within

organisations with respect of sharing information on ides created and support required. The provision of support through mentorship or coaching schemes could provide a means of employees having leadership support they desire for idea implementation in the workplace. These issues were not reported in the English NHS case study where a formal department and support system for innovation implementation was in place.

3. **Practitioners to allow time for reflection.** The study demonstrated the importance of the reflection process in innovation and learning. However, employees often do not have time to do so. Practitioners may wish to allocate/allow flexibility of time in the workday schedule for employees to reflect upon actions taken and think about how improvements could be bade based on previous actions. This includes providing a physical space for reflection and adopting a management approach whereby employees will not be punished for failure of innovation.

A final recommendation for both policy and practice is the need to assess the collective factors that influence innovative work behaviour as opposed to assessing each one in isolation. It has been demonstrated, through the use of Social Cognitive Theory as the theoretical framework, that inter-relations occur between factors in the workplace. For example, information literacy is a pre-requisite to recognise the need to innovate and this influences how employees behave with information. Additionally, successful innovative work behaviour depends on how the culture and strategy in the organisation align, but also how the culture and strategy are communicated by leaders of the organisation. Therefore, the above framework provides evidence as to the factors that influence innovative work behaviour in multiple workplace contexts, and the factors that should be considered in innovative work behaviour development. Assessment of such factors in the workplace setting would require exploration of the factors in relation to the framework presented here plus an impact assessment as to how each factor impacts other elements of the workplace.

9.5 Strengths and limitations of research design

There were several strengths and limitations of the research design for this study. Firstly, the study adopted a multi-method approach. Data was collected using three methods: semi-structured interviews, focus groups and a quantitative questionnaire. The use of the multi-method approach was used in an inductive way to draw conclusions from the data which emerged from the study participants rather than test a specific hypothesis (see Morse, 1991; 2003). This approach allowed for the triangulation of findings from the analysis qualitative and quantitative data collected which increased the reliability and validity of findings in this study. The collection of data from three different organisational contexts allowed for the contextual differences in innovative work behaviour development to emerge and be compared.

Issues with the complexity of the definition of innovation were highlighted in Chapter 2 (see section 2.4.2.6 on page 56). A strength of this research is that the main concepts of the research were made clear to the participants through a discussion of the concepts as part of the interview and focus group procedure. In doing so, this allows for the comparison of work on innovative work behaviour with other literature where a definition of innovative work behaviour is given, as it is clear that participants understand the concepts they discussed during data collection. This also ensures that caution can be taken when making comparisons with literature with specific reference to other types of innovation (e.g. product innovation, process innovation and, service innovation).

The research reported in this thesis has a number of limitations. For example, although a detailed description of innovative work behaviour development was developed through conducting three case studies of different organisation, little attempt was made during the analysis to quantify the specific frequency of occurrences where participants discussed a certain topic. This is common in qualitative studies (Atieno, 2009, p.17) where it is often only possible to give a general overview of the proportion of participants in a study who discussed an overarching theme as opposed to specific examples.

Another methodological limitation of the study is the reduced generalisability of case study findings. The purpose of the study was to highlight contextual differences in innovative work behaviour development. However, as with many

qualitative studies the findings of the qualitative elements of the individual case studies cannot be directly extended to wider populations with the same degree of certainty of quantitative studies (Atieno, 2009, p.17). This is because, as noted in Chapter 4, it was not possible to identify whether the sample in each case study reflected the real population of the case study organisation. To this end, caution should be taken when making comparisons of the findings of the three individual case studies to other organisations in the university and healthcare settings.

The method of participant recruitment for the English NHS case study posed a limitation. As an external person to the NHS Trust, the researcher had no control over the reach of study advertisements and as a consequence, bias could be presented in the recruitment of participants. The sample was derived on an opportunistic basis (i.e. through participants who were available during the time scale of the data collection) as opposed to purposefully using other sapling techniques (Ezzy 2002; Mays & Pope, 1995; Reed et al., 1996). For example, although communication was made between the main NHS research contact and the researcher as to where the study would be advertised, the researcher was unable to evidence exactly where the study was advertised and whether the advertisement had the potential to reach all employees on the case study site. This meant that maximum variation in sampling may not have been achieved (Baum 2002, p176) as the researcher was prohibited from being involved in the advertisement process. The sample of participants included a small proportion of staff who were self-selected for the study in a short time period, so if the advertisements did not reach some employees of the Trust then they may have not been aware of the need of recruitment. This was not the case for the data collection within the Scottish and Finnish University case studies where the researcher was either copied into emails, or shown emails sent to specific mailing lists to advertise the study to employees of the entire university.

As for the quantitative questionnaire, the findings cannot be considered truly representative of the entire case study organisations. This is because the number of participants for each questionnaire was much lower than the total employees of the organisations and the attrition rates of questionnaire completion were high (see Table 37 below). The sample also indicates a clear

bias towards employees of a White British and White Scottish background in the Scottish University case study whereas the proportions of diversity of ethnic background are, in reality, much higher. It is also not possible to disclose the demographic information specifically for participants of the Finnish case study questionnaire due to low participation numbers and the need to maintain anonymity of participants.

Table 36: Percentages of participants who did not complete sections of the questionnaire

Stage of questionnaire abandonment	Scottish University	Finnish University	English NHS Trust
Consented but abandoned questionnaire before completing page 1 of section 1	13%	25%	12%
Completed page 1 of section 1 but abandoned questionnaire before completing page 2 of section 1	6%	3%	1%
Completed all of section 1 abandoned survey before completing section 2	1%	0%	1%

9.6 The importance and implications of the research findings

Despite the limitations reported in section 9.4 above, this research is robust and the findings of the study have important implications.

In Scotland, engagement with employers with respect of improving skills and abilities is a key part of the work of Skills Development Scotland (Totterdill et al., 2016). The policy vision of Skills Development Scotland is to focus on workplace innovation as a means of enhancing both skills utilisation and individual learning in the workplace (Totterdill et al., 2016, p.2). The recognition of the role of individual employees in workplace innovation is a concept just emerging within Skills Development Policy.

The Employer Engagement Framework, developed for Skills Development Scotland suggests that there is a gap between evidence and practice in respect of workplace innovation. This means that work has been carried out to improve workplace innovation but difficulties have emerged when applying research findings to practice. Despite this criticism, the development of employee-led innovation has not been fully explored in terms of how the factors that enhance innovative work behaviour and the mechanism by which organisational can support employees to innovate. To this end, the study reported in this thesis has addressed this need by exploring the factors that enhance the development of innovative work behaviour, and how organisations can support employees to do so.

An in-depth study of the development of innovative work behaviour is important for multiple reasons. Skills Development Scotland work with a variety of organisations where strategy and context differ. The main data collection for this work comprised three case studies of three different organisations to highlight contextual differences and similarities in the factors that influence innovative work behaviour development of employees. This findings reported in this thesis demonstrate the need to adapt workplace approaches to individual organisations and take into consideration the organisational strategy as these impact on the behaviours of the employees.

From a policy perspective, the findings of this work are important because they allow policy makers in Scotland to draw comparisons from international case studies and develop strategies as to how to enhance innovative work behaviour through the use of information and suitable workplace practices. The cross-case study comparison between the Scottish University, Finnish University and the English NHS Trust has enabled key trends in innovative work behaviour development to be highlighted (e.g. determinants of specific behaviour) and allowed for individual characteristics of organisations and employees to flourish.

Finally, the findings of this research are crucial because the highlight several issues that hinder innovative work behaver development. Issues in respect of the coherence between organisational strategy and culture and, information management concerns were highlighted to hinder innovation (e.g. information overload, trust in sources of information and the ease of navigation of

information sources). These issues are important to help to understand the impact of information processes in the workable given that information and digital skills are vital in the modern workplace (ONS, 2019).

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Appendices

Appendix A: Interview and focus group questions

Semi-structured interview schedule

<u>**Opening**</u>

- ***Introduce self / establish rapport***

  Hi, my name is Lyndsey and I am a second year PhD student at Edinburgh Napier researching how people innovate in the workplace. As I know that your organisation has a strong vision and strategy directed towards innovation, I am interviewing staff members who work for the support services so that I can understand how innovation is encouraged and supported within the organisation. I appreciate that you have agreed to be interviewed for my PhD, and thank you for the time you have taken to talk to me today.

- ***Ethics – anonymity and confidentiality***

  Just to let you know that you can stop the interview at any point of you did not wish to continue. You can also withdraw your information and data at any point during the interview and up to the point where the data is analysed as it would then be difficult to do so. All interviews and information are confidential and remain anonymous so only I will be able to identify your information from the interview as I am present at this time. Any information you give will be anonymised if presented to the wider audience, and this includes removing any identifiable information (such as organisation or names you mention).

  This interview will be recorded on the devices you see here. The recordings will only be used for the purpose of the research and will not be distributed elsewhere. The recordings will be transcribed for the purpose of data analysis to help me pick out themes. Original recordings will not be used in sharing of research results, and all recordings will be

stored away with access only by myself. Are you okay with this interview being recorded?

- ***Purpose***

My research explores how workplace learning can be used to support the development of innovative work behaviours for employees, but I know people might be unsure of what I mean by these terms.

When I talk about workplace learning, it is any form of learning that takes place within the organisation. This could be formalised learning like training, which is often pre-schedules and taught, or it can be informal such as mentoring, shadowing or even networking with others where this is involves interactions between people and is often not pre-scheduled. Is this definition clear to you? Do you have any questions about this to help your understanding of workplace learning?

For innovative work behaviours, these are behaviours relating to how people innovate. For example, people recognise that they need to innovate and then create an idea. They then champion the idea, or tell people about the idea and then they implement the idea. I'm not looking at the outputs of innovation, such as developing a new product or process. It is more about what people do in the workplace to create an idea and implement the idea. Is this definition clear to you? Do you have any questions about this to help your understanding of innovative work behaviours?

My PhD is exploring how organisations can support the development of innovative work behaviours, and what they could do to encourage such behaviours. This is why I am interviewing you. I am interviewing leaders, managers and non-managerial employees to gain insight into how culture (values and beliefs) and strategy of the organisation may influence the workplace learning of innovative work behaviours. I am looking at how organisations can support the development of innovative

work behaviours and to see if there are any specific factors that make workplace learning successful.

- *Motivation*

  I'm hoping that the information can help me understand how organisations can support employees to develop innovative work behaviours, and I can create some guidelines or recommendations based on overall information I receive.

- *Time line of interview*

  So the interview will last approximately 45 minutes and you are free to ask questions at any point. Are you available to talk for this length of time?

- *Transition to main body*

  'Let me begin by asking you some questions about your own role and what you do'

Main body

Section 1: Contextual factors

The next questions will be relating to how organisations can support the development of innovative work behaviours.

So this section is going to explore about organisational strategy and organisational culture and how these can facilitate learning. By organisational strategy I mean a plan or action, or steps, you take to achieve a long term goal. The organisational culture are just the values and beliefs of the organisation and this can be filtered through to employees. We are going to also explore other contextual factors too.

RQ: Which contextual factors support innovative work behaviours for application at individual and collective levels in the workplace?

1. Tell me about what strategies does your organisation have in please to help you learn to innovative?
2. What things do your managers to in terms of helping you learn to innovate?
3. What part of the culture (values and beliefs of the organisation) help you to develop innovative work behaviours?
4. What inhibits your learning of innovative work behaviours?

PROMPTS (ONLY IF NEEDED):
- *Continuous evaluation*
- *Attitude and thinking (not contextual)*
- *Participation in learning activities*
- *Participation in training*
- *Use of provided infrastructure*
- *Knowledge sharing practices*
- *Participation in CoPs*
- *Information literacy*
- *Information behaviours*
- *Information seeking*

5. Tell me about kind of values and beliefs (organisational culture) your organisation has that helps you to learn to innovate?
6. What kind of values and beliefs does your manager have to help you learn to innovate?
7. How does the beliefs and values to help you to learn to innovate?
8. Are there any specific values and beliefs you feel are necessary to help support employees learn / develop innovative work behaviours?

The next section will focus on things that determine successful workplace learning in relation to learning of innovative work behaviours.

RQ: What are the determinants of successful workplace learning in relation to learning to innovate?

Literature suggests that there are various things that determine successful workplace learning (to innovate), and things that learning to innovate need to be successful.

1. What elements (culture, strategy, policies, things the organisation has in place) do you feel are _vital_ in making sue our learning is successful?
2. Why are these important?
3. Are there any elements you feel _contribute a lot_ to you being successful in learning to innovate?
4. Is there anything you think could determine successful workplace learning, but that your organisation does not have this in place to help you?
5. What are the reasons for these choices?

- _Prompts (as above)_
- _Focus on culture and strategy_

The final section asks questions on information literacy and information behaviours. Information literacy is how people recognise when information is needed and have the ability to locate, evaluate, and effectively use the information they need. Information behaviours explain how people interact with information. For example, how they seek and utilise the information (how people get and use information). This section asks questions about how information behaviours can support or enhance workplace learning.

RQ: Which information behaviours support successful workplace learning as related to the development of innovative work behaviours?

1. How do you think information literacy plays a role in your own learning in the workplace? So the ability to recognise when you need information then acting upon this.

2. Which information behaviours do you believe are important to help you learn? For example, seeking information, retrieving information, searching for information.
3. Why do you think the above?

- *Prompts: information behaviour*
- *Prompts: information searching*
- *Prompts: information seeking*
- *Prompts: information retrieval*
- *Prompts: evaluating information*
- *Prompts: sharing information*

So we are nearly at the end of the interview now. Are there any other points you would like to make that we have not been able to talk about today?

Thank you for taking part in this interview. Ill quickly recap and then that will be the end of the interview.

<u>**Closing**</u>

So to quickly summarise the interview, I have asked some questions on what you think influences the workplace learning of innovative work behaviours. This part talked about how organisations can support the development of innovative work behaviours and what kinds of things determine successful workplace learning. We talked about how successful workplace learning can be identified within organisations before moving onto the final section which asked questions about how information behaviours can support the development of innovative work behaviours.

Just a reminder that all information you have provided is confidential and will be kept anonymous if presented to the academic or non-academic audience. Your own information will not be identifiable in any way. If you

do wish to remove your information from this study, please do not hesitate to get in touch.

Thank you for taking time out of your schedule to be interviewed. Do you have any questions?

Appendix B: Survey questions

Purpose of research

This research is carried out by a PhD student in the School of Computing at Edinburgh Napier University, Lyndsey Jenkins (L.Jenkins@napier.ac.uk). This research is supervised by Professor Hazel Hall (H.Hall@napier.ac.uk).

Innovation is important for leadership, employment growth and progression. However, we do not fully understand how innovation develops for individual employees. The aim of the PhD research is to therefore explore the development of innovative work behaviour in the workplace. This will lead to the development of a framework (or set of guidelines) to explain how organisations can support employees to innovate. This survey will help researchers to create the framework.

In this survey, workplace learning refers to any form of learning that takes place in the workplace (e.g. formal workplace learning such as training, or informal workplace learning such as mentoring, coaching or interacting with colleagues). Innovative work behaviour refers to behaviours relating to how people recognise they need to innovate, create ideas, champion ideas and implement ideas at work.

What will the study involve?
You will be asked to complete a short questionnaire consisting of several questions relating to how you learn in the workplace. The survey will take no more than 20 minutes to complete.

Do I have to take part?
Participation in this study is completely voluntary. You are free to withdraw from the research at any point during the survey. You must give informed consent before participating in this study. If completing these questions makes you feel

uncomfortable, or you do not wish to continue, you are free to end the survey at any point. If you wish to stop during the survey, please just close the browser.

What happens to the information in the research?

The results of this survey will be viewed by the researcher and analysed to answer the research questions of the study. The study does not ask for any identifiable information or IP address. The information provided in this survey will be stored securely by the researcher, Lyndsey Jenkins, and will be kept confidential. Should the results of this survey be published, all data will be anonymised.

What happens next?

If you are happy to take part, please continue onto the consent part of the questionnaire.

[takes participant onto next page of survey]

Q1

Please tick the box to indicate your understanding of the statements below:

1. I freely and voluntarily consent to be a participant in this research to be conducted by Lyndsey Jenkins who is a postgraduate student in the Edinburgh Napier School of Computing. [insert tick box]

2. I have been informed of the broad goal of this research study. I have been told what is expected of me and that the study should take no longer than thirty minutes to complete. [insert tick box]

3. I understand that my responses will be anonymised. My name will not be linked with the research materials, and I will not be identified or identifiable in any report subsequently produced by the researcher. I have been told that these data may be submitted for publication. [insert tick box]

4. I also understand that if at any time during the survey, I feel unable or unwilling to continue, I am free to withdraw. That is, my participation in this study is completely voluntary, and I may withdraw from it at any time without negative consequences up until the point of data analysis being completed. [insert tick box]

5. In addition, should I not wish to answer any particular question or questions, I am free to decline. [insert tick box]

Q2

Do you consent to participating in this research and wish to continue (please indicate)?

Yes		[directs participant to questions]
No		[directs participate to a Thank you Page]

Q3 and 4: In this question, please consider how important you think the following factors are in you being able to develop innovative work behaviours at work (e.g. recognising the need to innovate, creating ideas, championing ideas, implementing ideas).

How important do you feel the following items are for you to be able innovate at work? (please indicate)

	Not at all important	Low importance	Slightly important	Neutral	Moderately important	Very important	Extremely important
Designated time for learning and development activities (e.g. for training)							
Funding for new initiatives, learning and development							
Opportunities to collaborate with others (e.g. in mentoring relationships)							
Access to appropriate tools and technology (e.g. computer facilities, new software)							
Access to physical space for independent work							
Access to a physical space for collaborative work (e.g. comfortable space away from desk, staff common room)							
Open plan office environments							
Institutional direction (e.g. organisational strategy that promotes innovation)							
Supportive leadership (e.g. approachable and supportive managers)							
Availability of training opportunities							

Your actual participation in training opportunities (e.g. whether you participate in training opportunities)						
Ease of participation in training opportunities (e.g. training activities scheduled at a suitable time for me)						
Personal belief in the goals and strategy of the organisation						
Personal enthusiasm						
Quality of communication between colleagues						
Time to reflect						
Internal knowledge sharing (i.e. between colleagues)						
External knowledge sharing (e.g. with peers at conferences)						
Knowledge transfer from external environment into internal environment (e.g. news from conferences)						
Your ability to cope and deal with change						
Permission to take risks						
Your skills in searching for information (e.g. knowing where to look)						
Your skills in retrieving information (e.g. knowing how to access relevant material)						
Your skills in analysing information						
Individual skills in interpreting information (e.g. statistics)						

Your skills in sharing information (e.g. knowing techniques for passing information onto others)						
Your skills in presenting information						
Access to a navigable corporate information/knowledge base						

Q5: How frequently have you participated in the following learning activities in the last year?

An activity which helps learning	Never	On an occasion (e.g. once or twice)	Sometimes	Many times	Very often or always
Acquiring new information (e.g. by searching the internet or company knowledge base)					
Working alone or with others to develop solutions to problems					
Working alone to develop new ideas					
Working with others to develop new ideas					
Following new developments in your field					
Performing new tasks					
Asking colleagues for advice					
Using self-study materials					
Observing or replicating colleagues' strategies to complete a task or solve a problem					
Finding better way to do a task by trial and error					
Reflecting on previous actions					
Receiving feedback on tasks from work colleagues					

Q6. Does your organisation provide training for employees?

◉ Yes

○ No

Q7. How frequently have you attended a training course within the last year?

○ Never

○ On an occasion (e.g. once or twice)

○ Sometimes

○ Many times

○ Very often

[next page]

Some information about you

Q8. What is your employment rank?

○ Leader

(Employees who are responsible for departments (e.g. Directors, Assistant Directors, Deans, Head of Service) who are the highest rank in their service).

○ Manager

(Employees who have managerial responsibly of either other employees or services. They report to the leadership team).

○ Non-managerial employee

(Employees with no managerial responsibility within the organisation. They report to the managerial team.)

Q9. What is your highest academic qualification?

○ School

○ College

○ University (undergraduate)

○ University (postgraduate)

Q10. How long have you worked in your current organisation?

○ Less than 1 year

○ 1-2 years

○ 3-6 years

○ 7-10 years

○ 10+ years

Q11. I am (please select):

○ Male

○ Female

○ Non-binary

○ Transgender

○ Other

○ Prefer not to say

Q12. What is your age group?

○ 16-24 years

○ 25-34 years

○ 35-44 years

○ 45-54 years

○ 55-64 years

○ 65+ years

○ Prefer not to say

Q13. What is your ethnic background?

○ White British

○ White Irish

○ White Scottish

- ○ White English

- ○ White Welsh

- ○ Black, Black Scottish/English/Welsh or Other Black British: African

- ○ Asian, Asian Scottish/English/Welsh or Other Asian British: Indian

- ○ Asian, Asian Scottish/English/Welsh or Other Asian British: Pakistani

- ○ Asian, Asian Scottish/English/Welsh or Other Asian British: Bangladeshi

- ○ Asian, Asian Scottish/English/Welsh or Other Asian British: Chinese

- ○ Mixed: White and Black Caribbean

- ○ Mixed: White and Black African

- ○ Mixed: White and Asian

- ○ Mixed: White and Chinese

- ○ Gypsy Traveler

- ○ Prefer not to say

- ○ Other (please specify)

Q14. Please create a 4 digit anonymous code below:

Thank you for taking part in this survey.

You are free to withdraw from the research at any point during the survey. You can also request that your data be removed by the researcher up until the point where data analysis of all results has been completed. If you wish to withdraw your data once complete, you can email the researcher on the email address provided and specify your 4 digit anonymous code you were asked to create above:

Lyndsey Jenkins: L.Jenkins@napier.ac.uk

Appendix C: Scottish Case Study Participant Information

Participant (and code)	Employment rank			Department of employment										Method of participation (Interview or focus group, FG)									Gender	
	Leader	Manager	Non-managerial employee	D1 HR	D2 ST UREC	D3 EXT REL	D4 COM MS	D5 WID PART	D6 L&T	D7 SSS	D8 RIO	D9 IS	D10 P&F	Interview	FG1	FG2	FG3	FG4	FG5	FG6	FG7	FG8	Male	Female
P1 (LD1I)	X			X										X										X
P2 (LD1I)	X			X										X										X
P3 (LD2I)	X				X									X									X	
P4 (LD7I)	X									X				X									X	
P5 (LD3I)	X					X								X										X
P6 (LD6I)	X								X					X									X	
P7 (LD4I)	X						X							X										X
P8 (LD5I)	X							X						X										X
P9 (LD8I)	X										X			X										X
P10 (MD1F)		X		X											X									X
P11 (MD1F)		X		X											X									X
P12 (MD1F)		X		X											X									X
P13 (MD7F)		X								X						X								X
P14 (MD7F)		X								X						X								X
P15 (MD7F)		X								X						X								X
P16 (MD3F)		X				X											X							X
P17 (MD3F)		X				X											X							X
P18 (MD3F)		X				X											X							X
P19 (MD3F)		X				X											X							X
P20 (MD8I)		X									X			X									X	
P21 (MD8I)		X									X			X										X
P22 (MD8I)		X									X			X										X
P23 (MD6I)		X							X					X										X
P24 (MD5I)		X						X						X									X	
P25 (MD5I)		X						X						X										X
P26 (MD5I)		X						X						X									X	

Participant (and code)	Employment rank			Department of employment										Method of participation (Interview or focus group, FG)									Male	Female
	Leader	Manager	Non-managerial employee	D1 HR	D2 ST UREC	D3 EXT REL	D4 COMMS	D5 WID PART	D6 L&T	D7 SSS	D8 RIO	D9 IS	D10 P&F	Interview	FG1	FG2	FG3	FG4	FG5	FG6	FG7	FG8	Male	Female
P27 (NMD9F)			X									X						X					X	
P28 (NMD9F)			X									X						X						X
P29 (NMD9F)			X									X						X						X
P30 (NMD8F)			X								X								X				X	
P31 (NMD8F)			X								X								X				X	
P32 (NMD8F)			X								X								X					X
P33 (NMD7F)			X							X										X				X
P34 (NMD7F)			X							X										X				X
P35 (NMD7F)			X							X										X			X	
P36 (NMD1F)			X	X																	X			X
P37 (NMD1F)			X	X																	X			X
P38 (NMD1F)			X	X																	X			X
P39 (NMD7F)			X							X												X		X
P40 (NMD7F)			X							X												X	X	
P41 (NMD7F)			X							X												X	X	
P42 (NMD7F)			X							X												X		X
P43 (NMD4I)			X					X						X										X
P44 (NMD4I)			X					X						X									X	
P45 (NMD7I)			X							X				X										X
P46 (NMD7I)			X							X				X									X	
P47 (NMD8I)			X							X				X										X
P48 (NMD4I)			X					X						X										X
P49 (NMD9I)			X									X		X										X
P50 (NMD9I)			X									X		X										X
P51 (NMD4I)			X					X						X										X
P52 (NMD4I)			X					X						X									X	
P53 (NMD1I)			X	X										X										X

328

Participant (and code)	Employment rank			Department of employment										Method of participation (Interview or focus group, FG)									Male	Female
	Leader	Manager	Non-managerial employee	D1 HR	D2 ST UREC	D3 EXT REL	D4 COM MS	D5 WID PART	D6 L&T	D7 SSS	D8 RIO	D9 IS	D10 P&F	Interview	FG1	FG2	FG3	FG4	FG5	FG6	FG7	FG8		
P54 (NMD9I)			X									X		X										X
P55 (NMDI)			X									X		X										X
P56 (NMD7I)			X							X				X										X
P57 (NMD8I)			X								X			X										X
P58 (NMD7I)			X							X				X										X
P59 (NMD10I)			X										X	X									X	

Appendix D: NHS ethical approval procedure

NHS ethics procedures

As part of the case study data collection within the NHS Trust in England, a separate ethical procedure was required to gain approval form the Health Research Authority. This requirement is a new procedure designed to improve the quality of research within the NHS, and is required for all research being carried out in an NHS Trust in England regardless of where the researcher is based. To apply for approval to carry out a case study of the NHS Trust, there were three stages to this process: (1) the research passport; (2) submission of online forms and supporting documentation; (3) submission of local documentation to the NHS trust.

The research passport

Doctoral students who wish to carry out research within the NHS require a research passport. This document grants the student access to the NHS as a researcher and approved the researcher to carry out the work. The process of obtaining the passport required the researcher's home institution (Edinburgh Napier) to approve the researcher for this case study ad complete a series of pre-engagement checks before the researcher set this information to the local NHS Research and Development office. The form completed required information on:

(1) Personal details of the researcher;

(2) Information on the proposed project (e.g. aims and methods);

(3) The student's supervisor to agree that all research related training has been completed as part of the doctoral study programme'

(4) A disclosure and Barring Service check (if required for the research);

(5) An occupational health screening check;

(6) Two references;

(7) A CV of the researcher;

(8) Authorisation signatures of the supervisor, human resources and the researcher.

This process was carried out as the researcher's institution hosts the responsibility of ensuring the researcher is able to carry out the work. This

approval was then provided to the Research and Development team of the NHs trust who then reviewed the application. The application required approval as the first stage of carrying out this research. The approval granted was as follows:

(1) A letter of access was given to the researcher to enable the research to be carried out within the project timescale;
(2) The later above stated requirements for the researcher to adhere by when conducting research;
(3) The letter also stated the researcher's supervisor within the NHs trust. This person is not part of the supervisory team, but a manner of staff within the NH who has the responsibility of overseeing the research.

It must be noted here that the procedures above were specific to this research as the student is based in Scotland but carried out data collection in England. Procedures in obtaining a research passport differ if:

(1) The student is a nursing or clinical student on placement;
(2) The student is employed within the NHS;
(3) The student is in Scotland and is carrying out research work also in Scotland.

Once the letter of access as part of the research passport has been obtained, the researcher then prepared and submitted formal documentation or review. This is discussed in the next section of the chapter.

Submission of forms and documentation to the HRA

The approval of this research in the NHS required the researcher to complete an online form and supply several supporting documentation to the Health Research Authority (HRA). Further details on specifics of approval processes can be found on the HRA website: http://www.hra.nhs.uk/about-the-hra/our-plans-and-projects/assessment-approval/. As part of this process it was discovered that because the researcher was sampling NHS staff and not patients, this research did not require formal Research Ethical Committee (REC) review. However, the research required approval from the Health Research Authority.

First, the researcher was required to register on the Integrated Research Application System (IRAS). This created the online application for the project. The application could be saved and revisited any time.

Next, the researcher had to identify all parties involved in the process. These were:

(1) The sponsor – in this research this is the university in which the researcher is based. The researcher was required to provide details of a named individual who would be responsible for ensuring that the research was carried out appropriately for the university;

(2) The supervisors – as the research was part of an education programme, the supervision team was required to be named on the application;

(3) The Principal Investigator – this was a person within the NHS trust who would be responsible for overseeing the research whilst it was being. The local NHs trust provided these details for the researcher.

The researcher was the required to complete three elements of the form: (1) the IRAS form for review by the Health Research Authority: (2) The NIHR CRN Portfolio Application Form; (3) creation of supporting documentation to accompany the application.

The IRAS form asked the researcher details about the research. The first part involved the researcher completing 11 questions to enable the IRAS system to generate the appropriate questions to complete. Details in this were study type, research methods and whether this research was part of an educational curse. For this, the full IRAS form was generated. 78 questions were completed including questions regarding:

1. full title of research and
2. researcher details, supervisor details and sponsor details
3. a general summary of the study;
4. a summary of the ethical, legal and management issues in the study;
5. research methodology details (including design, methodology and research questions);
6. scientific justification of for the research and methods;

7. whether the general public have been involved in research design and management;

8. details on risks and issues;
   a. to the participants;
   b. to the organisation;
   c. to the data

9. details of participation – activities participants are required to undertake, time of participation required;

10. benefits of the research to participants and the organisation;

11. details of recruitment procedures (approaching participants, methods used);

12. details of informed consent, withdrawal and capacity to participate;

13. storage, use, access and security of:
    a. research data;
    b. identifiable data (e.g. names, gender, age, ethnic group);
    c. data during the study;
    d. data after the study

14. incentives and payments to participants;

15. details of publication and dissemination (including methods, confidentially and anonymity);

16. registration of the project on a public database (see next section);

17. details on the assessment of scientific quality of the research (e.g. peer review of documents, journal articles);

18. details on how statistical elements of the research have been reviewed by a statistician;

19. outcome measures for the study;

20. expected sample size for research and whole project;

21. methods of data analysis;

22. details of collaborators, sponsors and funders;

23. responsibility for legal issues associated with the research;

24. details of NHS sites

25. authorisations from the sponsor, researcher and supervisor as to the agreement with the submission of the form.

This application was also accompanied by 22 supporting documents which included documentation on:

1. A research protocol;
2. Evidence of training of the researcher;
3. Advertising materials for the research;
4. Participant information and consent forms;
5. Survey and interview questions;
6. CV of supervisors;
7. Evidence of insurance from the researcher's institution;
8. A sponsorship letter confirm the sponsor;
9. Documentation on NHS templates to explain activities involved in conducting the research

This process required all supporting documents to be names with date and version on both the file name and document itself to ensure any amendments could be made to the correct version. Once the form was complete and all documentation was uploaded, the researcher required all required authorisations. Upon completion of authorisations, the researcher called the Central Booking line to book the study in for a HRA review and was then able to submit the form. The form and documentation underwent a review form HRA practitioners. This was carried out and no amendments were required so a letter of approval was generated and sent to the researcher and sponsor. Whilst approval was pending, the researcher was able to complete the next stage of the process and send local documentation to the NHS trust. This is explained din the next section of the chapter.

Submission of local documentation to NHT trust.

The Research and Development office at the NHS Trust provided the researcher with a set of supporting documents required to be completed before any data collection could take place. This comprised 7 documents including:

(1) Risk assessment forms;
(2) A Caldicott approval form (for taking identifiable data off site);
(3) Study feasibility documentation;
(4) Agreement from Principal Investigator;

(5) A copy of the Letter of Access;

This was then send to the Research and Development office alongside some of the supported documentation submitted on the IRAS system. The purpose of this procedure is to obtain agreement for the NHS trust as to whether they can host the research and whether they have capacity to do so. Failure to submit these documents would have meant the research not being able to be carried out as the local NHS trust would not have had all relevant documentation to make provisions for the research procedure.

Appendix E: Example consent for NHS case study

IRAS ID: [XXXX]

Principal Investigator: [local PI name]

CONSENT FORM

Title of Project: [project title]

Name of Researcher: Lyndsey Jenkins

Please initial box

1. I confirm that I have read the information sheet dated.................... (version............) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected.

3. I understand that the information collected about me will be used to support other research in the future, and may be shared anonymously with other researchers.

4. I understand that my responses will be anonymised and that my data will not be identifiable to myself.

5. I agree to take part in the above study.

Name of Participant	Date	Signature

Name of Person taking consent	Date	Signature

Appendix F: Example advertisement materials (NHS)

<u>Letter sent by email</u>

<div align="right">
Edinburgh Napier University,
Merchiston Campus,
10 Colinton Road,
Edinburgh,
EH10 5DT

DD.MM.YY
</div>

[Insert recipients address]

Dear [insert name / title and surname],

I am a second year PhD student at Edinburgh Napier University currently conducting a case study of [name of trust] as part of my doctoral studies.

My research explores the relationship between workplace learning (any form of learning that takes place in the workplace, regardless of whether it is informal or formal) and the development of innovative work behaviours (behaviours relating to how people crate ideas, champion ideas and implement ideas in the workplace).

My research focuses on the experiences of employees in how they learn, and explores how organisations can support employees to learn to innovate in the workplace. The focus here is of how the organisational culture (values and beliefs) and the strategy of the organisation, and individuals within the organisation, can support this relationship as well as other factors that may support learning in the workplace.

As part of my research, I am carrying out the case studies to highlight contextual differences in the relationship between workplace learning and innovative work behaviours. So far, I have a case study based in Scotland, a case study being organised in Finland and finally [name of NHS Trust].

From the case studies, I hope to highlight differences in workplace learning across all three case studies and be able to create a framework (or set of guidelines) as to how organisations can best support the learning of innovative work behaviours. For this, I am looking to carry out interviews and focus groups with staff members within [name of NHS Trust] to explore their views on how they learn to innovate in the workplace.

I would like to invite you to participate in a [one to one interview/ focus group] as part of my NHS case study. This would take approximately one hour and as part of the process I would ask questions about your workplace learning and any culture or strategy influences you know of and how these can influence. All

information is confidential and all data is anonymised as part of the collection and analysis process.

Participating in my research would enable you to talk about your own learning in the workplace and contribute to the wider understanding of how workplace learning to innovate may work within [name of NHS Trust]. This is a particular focus of the strategy of the trust. As a research participant you would also be able to have access to the learnings from the doctoral studies and the results of the work input into the framework development. These results would be shared in an appropriate manner agreed with myself, my research funders and [name of NHS Trust].

If you are interested in taking part, or would like further details about my research or study procedure, please do get in touch on the following details:

Email: L.Jenkins@napier.ac.uk
Phone (office): [phone number]
Phone (mobile): [phone number]
Website: lyndseyjenkins.org

The local Principal Investigator this research is: [insert local PI name]

Thank you for taking time to read this letter.

Yours sincerely,

Miss Lyndsey Jenkins
[Insert manual signature]
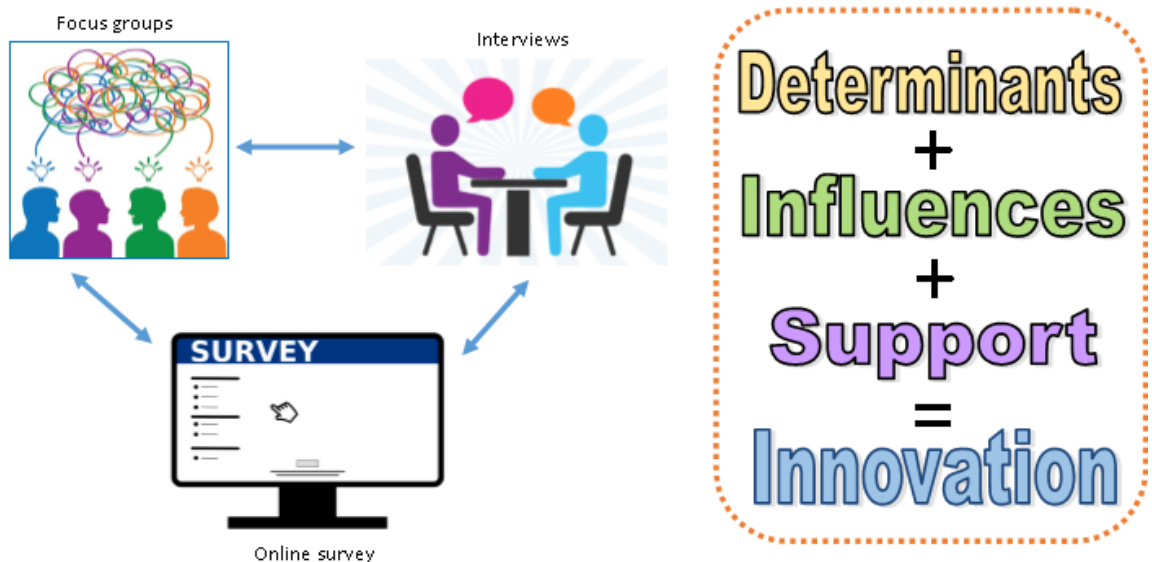(Edinburgh Napier doctoral candidate)

[Email signature]

Appendix G: Example transcript imported into NVivo

Resp. 1:   It's one of our values.

Resp. 2:   It's one of our values, but it doesn't happen, because we catch ourselves up in hoops with all our processes. So someone could come up with an idea, try and implement it, it takes a year to do it. And people are like "ohhh". So our culture doesn't, our actual processes in the organisation doesn't support our culture to be innovative.

I: Yeah. So does your culture welcome innovation and encourage innovation?

Resp. 1:   It would, but we need the means to deliver that, and deliver it quickly.

Resp. 2:   Like an example, I'm doing a project to develop new contracts. You think, that should be so easy, it should be done in three months. It's taken about a year to do. And we're still not there. So do you know, it's like something so simple because so many people have to have an input and you have to get approval, and you have to get this. You're like "why can't I just get it done?" And then you just go "there's no point in killing yourself here. I'll just happen whenever". You just want to get it done!

I: Yeah. And you have touched upon this element of change in the innovation process. How does your department view change? Is it welcomed? Is it…

Resp. 3:   We have a change team. In its broadest sense, I have to be honest. Absolutely in its broadest sense. Our change team tend to be…it's maybe slightly wrongly labelled, I have to be honest. It's maybe more managing projects, and doing discrete pieces of work, discrete projects. So again, I think there's a will in terms of, as an organisation. I think there is a will that's…I think there is a will.

I think partly what we're missing is maybe stronger sponsorship at senior level, to support those changes going through. And some of them have been pretty significant. "My Contribution" is a very good example. The visibility and the voice of the senior team I think is sometimes missing in these big change projects, and the expectations are high that people will just change, without fully understanding what any impact might be, on individuals, on teams, on the wider organisation. So I think the will is there. I think as an organisation we're good at that bit. But the practicalities around it, I think we're challenged with a wee bit.

Resp. 1: HR are often seen to be orchestrators of change. "HR have done this, HR have brought that in". I can speak a wee bit about the culture. But you'll know from your studies about what peoples' reaction to change can be, changes, all of those models and stuff. So often, we are the orchestrators of change, because a lot of it relates to the need to change processes effecting people. But it doesn't necessarily mean that it's all…it needs that top-down buy in as well, to get change into the culture. But generally…

Resp. 2: Yeah. I think the culture is that it takes a long time to change anything. Any small projects, large projects. But we will get there. But I think you just need the enthusiasm, you're right, from the senior leaders to just keep the momentum going. And within our own team, within HR, there's pockets that are willing to change, and there's pockets that aren't willing to change. And it's just about trying to drive that forward.

I: Yeah. Do you think change could depend on the individual or the individuals involved or whether they welcome change, whether they want to change?

Resp. 2: Definitely. I think it's personality thing, definitely.

Resp. 3: And what they've experienced before I think as well.

Appendix H: Example coded transcripts in NVivo

Image 1: Screenshot of coded transcripts from the Scottish case study

The data and coding framework can be seen to far left side of the screenshot (point A), with the coding framework at point B. The quotations from the coded transcripts are viewed to the right hand side of the screen at point C.
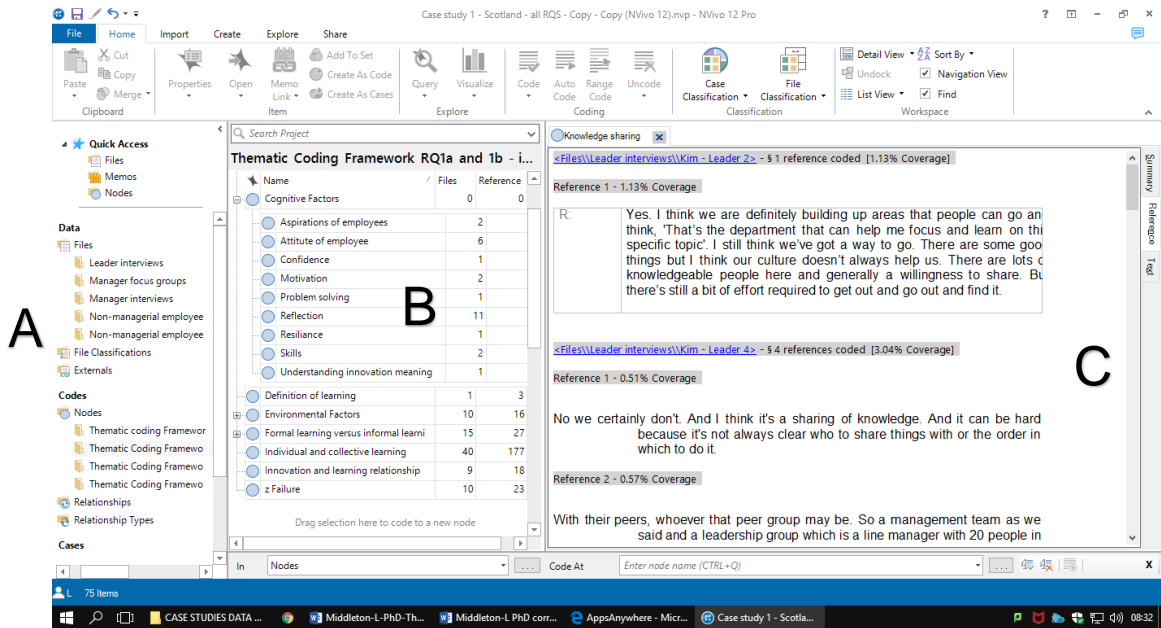
Image 2: Screenshot of transcripts entered into NVivo for the Scottish case study
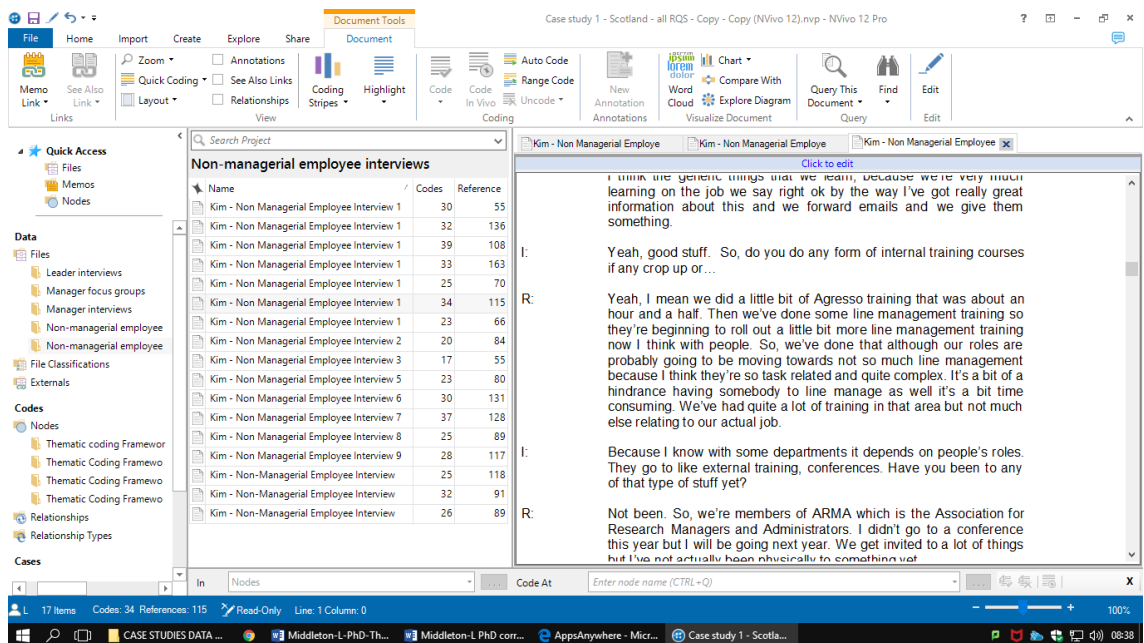
Image 3: Screenshot of coded transcripts in Finnish case study
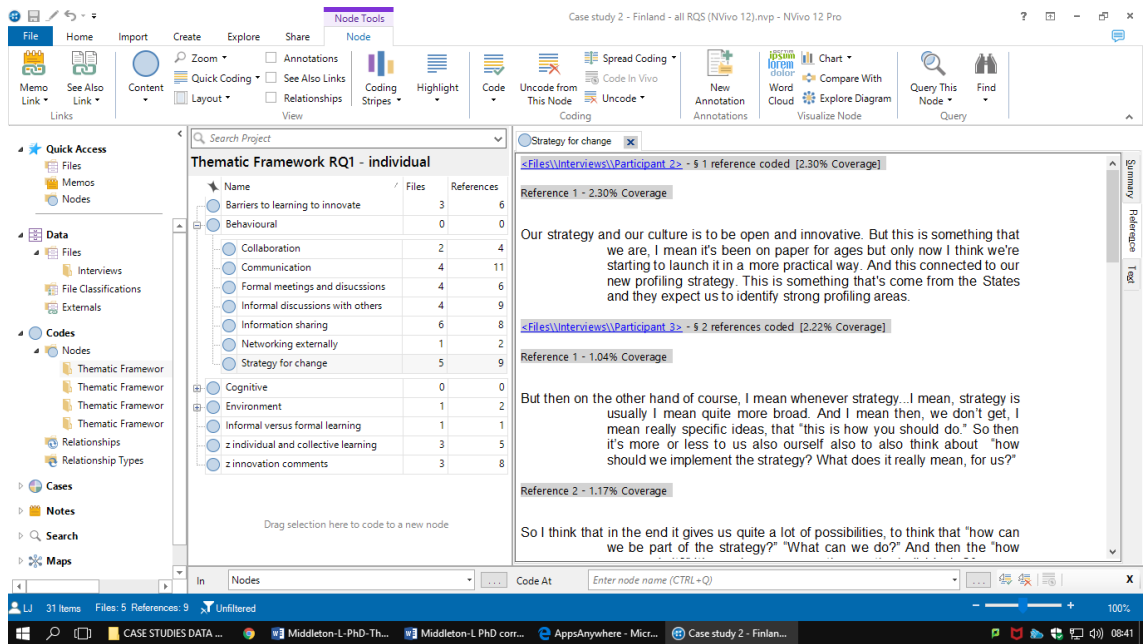
Image 4: Screenshot of coded transcripts in English case study
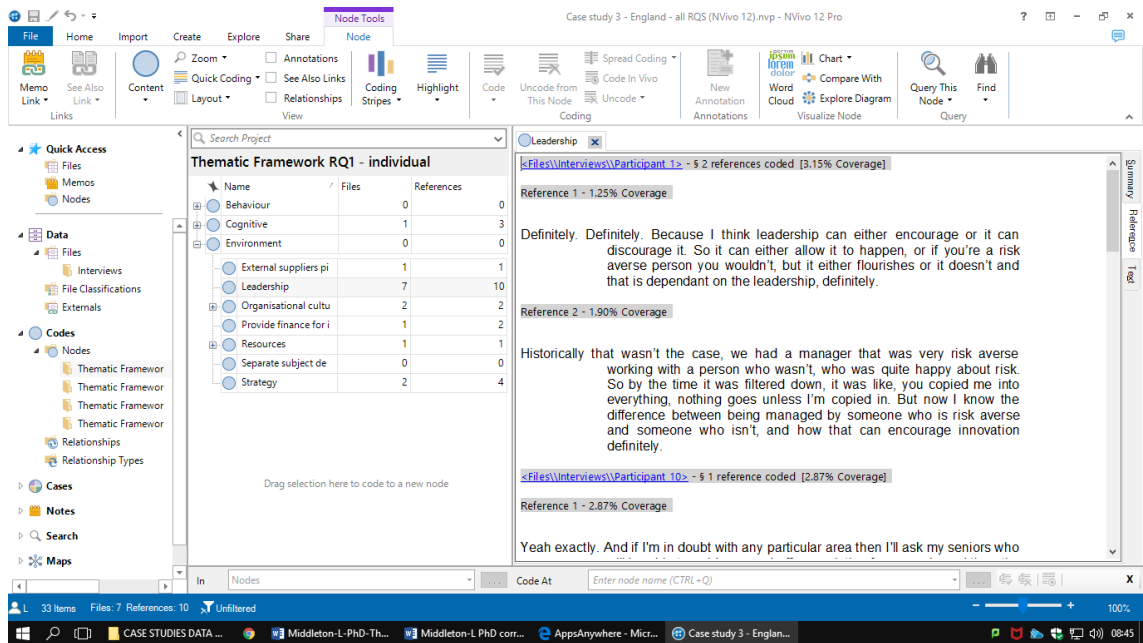
Appendix I: Example SPSS output

Binary Logistic Regression

```
LOGISTIC REGRESSION VARIABLES CAT_perform_new_tasks
  /METHOD=FSTEP(LR) Skills Training_and_learning Access_to_resources
Personal_drive_leadership
    Organisational_goals_strategy Knowledge_sharing CAT_gender
NCat_age_group NCat_Emp_Rank NCat_L_S
  /CONTRAST (NCat_age_group)=Indicator
  /CONTRAST (NCat_Emp_Rank)=Indicator
  /CONTRAST (NCat_L_S)=Indicator
  /CONTRAST (CAT_gender)=Indicator
  /PRINT=SUMMARY CI(95)
  /CRITERIA=PIN(0.1) POUT(0.15) ITERATE(50) CUT(0.5).
```

Logistic Regression

Notes

Output Created		18-OCT-2018 15:15:58
Input	Data	\\napier-mail.napier.ac.uk\staff\School of Computing\User Data\40009899\LYNDSEY'S DOCUMENTS\Analysis\SURVEY DATA\CASE STUDY 1 - Scotland\Workplace learning and innovative work behaviour case study 1 ANALYSIS - binary logistic.sav
	Active Dataset	DataSet1
	File Label	File created by user 'asyncjobs_user' at Wed Feb 14 10:47:40 201
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	205
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing

Syntax		LOGISTIC REGRESSION VARIABLES CAT_perform_new_tasks /METHOD=FSTEP(LR) Skills Training_and_learning Access_to_resources Personal_drive_leadership Organisational_goals_strategy Knowledge_sharing CAT_gender NCat_age_group NCat_Emp_Rank NCat_L_S /CONTRAST (NCat_age_group)=Indicator /CONTRAST (NCat_Emp_Rank)=Indicator /CONTRAST (NCat_L_S)=Indicator /CONTRAST (CAT_gender)=Indicator /PRINT=SUMMARY CI(95) /CRITERIA=PIN(0.1) POUT(0.15) ITERATE(50) CUT(0.5).
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.08

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	66	32.2
	Missing Cases	139	67.8
	Total	205	100.0
Unselected Cases		0	.0
Total		205	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
No activity	0
Completes activity	1

345

Categorical Variables Codings

		Frequency	Parameter coding (1)	(2)	(3)
Recoded Length of Service RR	.00	6	1.000	.000	.000
	1.00	14	.000	1.000	.000
	2.00	23	.000	.000	1.000
	3.00	23	.000	.000	.000
Recoded Age Group (RR)	1.00	14	1.000	.000	.000
	2.00	23	.000	1.000	.000
	3.00	14	.000	.000	1.000
	4.00	15	.000	.000	.000
Recoded Employment Rank (RR)	1.00	18	1.000		
	2.00	48	.000		
Gender	Males	24	1.000		
	Females	42	.000		

Block 0: Beginning Block

Classification Table^{a,b}

			Predicted		
			Perform new tasks		Percentage Correct
	Observed		No activity	Completes activity	
Step 0	Perform new tasks	No activity	46	0	100.0
		Completes activity	20	0	.0
	Overall Percentage				69.7

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.833	.268	9.670	1	.002	.435

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	F1 Skills	.015	1	.903
		F2 Training and learning	.201	1	.654
		F3 Access to resources inclusing space	1.695	1	.193
		F4 Personal drive and leadership	3.486	1	.062
		F5 Organisational goals and strategy	4.435	1	.035
		F6 Knowledge sharing	.141	1	.707
		Gender(1)	.023	1	.879
		Recoded Age Group (RR)	1.186	3	.756
		Recoded Age Group (RR)(1)	.025	1	.874
		Recoded Age Group (RR)(2)	.335	1	.562
		Recoded Age Group (RR)(3)	.246	1	.620
		Recoded Employment Rank (RR)(1)	2.343	1	.126
		Recoded Length of Service RR	1.134	3	.769
		Recoded Length of Service RR(1)	.581	1	.446
		Recoded Length of Service RR(2)	.246	1	.620
		Recoded Length of Service RR(3)	.297	1	.586
	Overall Statistics		15.102	14	.371

Block 1: Method = Forward Stepwise (Likelihood Ratio)

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 3	Step	4.153	1	.042
	Block	12.521	3	.006
	Model	12.521	3	.006

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
3	68.450[a]	.173	.244

a. Estimation terminated at iteration number 5 because
parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			Perform new tasks		
	Observed		No activity	Completes activity	Percentage Correct
Step 3	Perform new tasks	No activity	41	5	89.1
		Completes activity	13	7	35.0
	Overall Percentage				72.7

a. The cut value is .500

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 3[a]	F3 Access to resources inclusing space	.741	.397	3.479	1	.062	2.099
	F4 Personal drive and leadership	.689	.342	4.053	1	.044	1.991
	F5 Organisational goals and strategy	.716	.327	4.778	1	.029	2.046
	Constant	-.903	.304	8.810	1	.003	.405

Variables in the Equation

		95% C.I.for EXP(B)	
		Lower	Upper
Step 3[a]	F3 Access to resources inclusing space	.963	4.574
	F4 Personal drive and leadership	1.018	3.894
	F5 Organisational goals and strategy	1.077	3.886
	Constant		

a. Variable(s) entered on step 3: F3 Access to resources inclusing space.

Variables not in the Equation

			Score	df	Sig.
Step 3	Variables	F1 Skills	.002	1	.968
		F2 Training and learning	.374	1	.541
		F6 Knowledge sharing	.282	1	.595
		Gender(1)	.171	1	.679
		Recoded Age Group (RR)	1.501	3	.682
		Recoded Age Group (RR)(1)	.159	1	.690
		Recoded Age Group (RR)(2)	.483	1	.487
		Recoded Age Group (RR)(3)	.394	1	.530
		Recoded Employment Rank (RR)(1)	.868	1	.351
		Recoded Length of Service RR	2.030	3	.566
		Recoded Length of Service RR(1)	.952	1	.329
		Recoded Length of Service RR(2)	.305	1	.581
		Recoded Length of Service RR(3)	.610	1	.435
	Overall Statistics		4.371	11	.958

Step Summary[a,b]

Step	Variable
1	IN: F5 Organisational goals and strategy
2	IN: F4 Personal drive and leadership
3	IN: F3 Access to resources inclusing space

a. No more variables can be deleted from or added to the current model.

b. End block: 1

Reliability testing

RELIABILITY

 /VARIABLES=Institutional_direction Personal_strategy_belief Collaborate_opportunities

  Communication_quality_between_colleagues Supportive_leadership

 /SCALE('ALL VARIABLES') ALL

 /MODEL=ALPHA

 /SUMMARY=TOTAL.

Notes

Output Created		10-JUL-2019 09:34:59
Input	Data	\\napier-mail.napier.ac.uk\staff\School of Computing\User Data\40009899\LYNDSEY'S PhD DOCUMENTS\Analysis\SURVEY DATA\CASE STUDY 2 - England\Workplace learning and innovative work behaviour ENGLAND ANALYSIS.sav
	Active Dataset	DataSet1
	File Label	File created by user 'asyncjobs_user' at Wed Feb 14 10:43:50 201
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	104
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY
		/VARIABLES=Institutional_direction Personal_strategy_belief Collaborate_opportunities
		Communication_quality_between_colleagues Supportive_leadership
		/SCALE('ALL VARIABLES') ALL
		/MODEL=ALPHA
		/SUMMARY=TOTAL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	76	73.1
	Excluded[a]	28	26.9
	Total	104	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.783	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Institutional direction (e.g. organisational strategy that promotes innovation)	24.1579	9.788	.584	.744
Personal belief in the goals and strategy of the organisation	23.8158	10.979	.609	.726
Opportunities to collaborate with others (e.g. in mentoring relationships)	23.9605	11.665	.518	.757
Quality of communication between colleagues	23.3816	13.572	.560	.759
Supportive leadership (e.g. approachable and supportive managers)	23.4737	11.479	.613	.726

Compute mean of variables and t-test

COMPUTE MEAN_organisational_goals_strategy=Mean(Institutional_direction, Personal_strategy_belief,

   Communication_quality_between_colleagues, Collaborate_opportunities, Supportive_leadership).

EXECUTE.

T-TEST

 /TESTVAL=4

 /MISSING=ANALYSIS

 /VARIABLES=MEAN_organisational_goals_strategy

 /CRITERIA=CI(.95).

Output Created		10-JUL-2019 09:34:59
Input	Data	\\napier-mail.napier.ac.uk\staff\School of Computing\User Data\40009899\LYNDSEY'S PhD DOCUMENTS\Analysis\SURVEY DATA\CASE STUDY 2 - England\Workplace learning and innovative work behaviour ENGLAND ANALYSIS.sav
	Active Dataset	DataSet1
	File Label	File created by user 'asyncjobs_user' at Wed Feb 14 10:43:50 201
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	104
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on the cases with no missing or out-of-range data for any variable in the analysis.
Syntax		T-TEST /TESTVAL=4 /MISSING=ANALYSIS /VARIABLES=MEAN_organisational_goals_strategy /CRITERIA=CI(.95).
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
MEAN_organisational_goals_strategy	76	5.9395	.82560	.09470

	Test Value = 4				95% Confidence Interval of the Difference
	t	df	Sig. (2-tailed)	Mean Difference	Lower
MEAN_organisational_goals_strategy	20.479	75	.000	1.93947	1.7508

One-Sample Test

	Test Value = 4
	95% Confidence Interval of the Difference
	Upper
MEAN_organisational_goals_strategy	2.1281

Appendix J: Publications associated with this work

In this appendix, copies of the publications associated with this work are provided on the pages that follow.

The publications are:

Middleton, L., Hall, H., Muir, L., & Raeside, R. (2018). The interaction between people, information and innovation: information literacy to underpin innovative work behaviour in a Finnish organisation. In L. Freund (Eds.), *Association for Information Science and Technology 81st Annual Meeting: Building an Ethical and Sustainable Information Future with Emerging Technologies* (pp. 367-376). Somerset, NJ: John Wiley & Sons, Inc.

Middleton, L., Hall, H., & Raeside, R. (2018). Applications and applicability of Social Cognitive Theory in Information Science research. *Journal of Librarianship and Information Science*, DOI: 10.1177/0961000618769985, ISSN 0961-0006